Understand the influential role of education on young people

Kadlec, Željka; Jukić, Martina

FACULTY OF ECONOMICS IN OSIJEK
POSTGRADUATE STUDY MANAGEMENT
JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK
HOCHSCHULE PFORZHEIM UNIVERSITY

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INTERDISCIPLINARY MANAGEMENT RESEARCH XIX
INTERDISZIPLINÄRE MANAGEMENTFORSCHUNG XIX

EFOS

JOSIP JURAJ STROSSMAYER UNIVERSITY OF OSIJEK
FACULTY OF ECONOMICS IN OSIJEK - CROATIA
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INTERDISCIPLINARY MANAGEMENT RESEARCH XIX
INTERDISZIPLINÄRE MANAGEMENTFORSCHUNG XIX

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Ivan Kristek, Ph.D., Faculty of Economics and Business in Osijek,
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University of Bihać, Bosnia and Herzegovina
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University of Bihać, Bosnia and Herzegovina
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J. J. Strossmayer University of Osijek

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Vorwort

Es ist uns ein Vergnügen, das Konferenzband "Interdisziplinäre Managementforschung XIX / Interdisciplinary Management Research XIX" vorstellen zu können. Ein Buch aus dieser Reihe ist zum ersten Mal 2005 erschienen, als Resultat der Zusammenarbeit zwischen der Wirtschaftsfakultät in Osijek, Kroatien und der Hochschule Pforzheim, Deutschland, und insbesondere durch das Magisterstudium des Managements. Die Zusammenarbeit der zwei genannten Partnerinstitutionen ist unter anderem durch jährliche wissenschaftliche Symposien gekennzeichnet, auf welchen interessante Themen aus verschiedenen Bereichen der Wirtschaft und des Managements vorgestellt und folglich in einem Band veröffentlicht werden. Jedes Jahr ziehen die wissenschaftlichen Symposien Akademiker anderer kroatischer, sowie ausländischer Universitäten, einschließlich Österreich, Deutschland, Ungarn, Polen, Rumänien, Slowenien, Montenegro, Bosnien und Herzegowina, Serbien, Indien, Irland, Tschechien, Island, Italien, Litauen, Kosovo, Türkei, Belgien, Schweiz, USA, Slowakei, Mazedonien, und Großbritannien an, die ihren wissenschaftlichen und professionellen Beitrag zur Diskussion über zeitgenössische Fragen aus dem Bereich des Managements leisten. Die Aktualität der behandelten Fragen, der internationale Charakter im Hinblick auf Themen und Autoren, die höchsten Standards der Forschungsmethodologie sowie die Kontinuität dieser Konferenzreihe wurden auch von der internationalen akademischen Gemeinde erkannt, weswegen sie auch in internationalen Datenbanken, wie Clarivate Web of Science, EconLit, Thomson ISI, RePEc, EconPapers und Socionet, zu finden ist.

Die neueste Ausgabe von "Interdisziplinäre Managementforschung XIX / Interdisciplinary Management Research XIX" umfasst 70 Arbeitengeschrieben von 148 Autoren aus 7 Landern. Der Erfolg früherer Ausgaben ging über die Grenzen der Länder hinaus, deren Autoren schon traditionell Teil der Reihe waren. Jedes der Autoren leistete einen bedeutenden Beitrag zu diesem fachübergreifenden Managementforum.

Als Herausgeber dieses Bandes hoffe Ich, dass diese Reihe auch weiterhin Akademiker und Professionelle dazu bewegen wird, in Forschung und Beruf die höchsten Standards zu beanspruchen, und dass es weiterhin als Ansporn zu weiteren Formen von Zusammenarbeit unter Teilnehmern dieses Projektes dienen wird.

Aleksandar Erceg, Ph.D., Faculty of Economics and Business in Osijek

Foreword

We are pleased to introduce the book "Interdisciplinary Management Research XVIII/ Interdisziplinäre Managementforschung XIX" to you. The first volume appeared in 2005 because of cooperation between the Faculty of Economics in Osijek (Croatia) and Pforzheim University of Applied Sciences (Germany), mainly through the postgraduate program "Management". The cooperation between these partnering institutions has been nurtured, amongst others, through annual scientific colloquiums at which exciting topics in various fields of economics and management have been presented and later published in the proceedings. Over the years, the scientific colloquiums have drawn the attention of academic scholars from other Croatian universities, as well as from other countries, including Austria, Australia, Germany, Hungary, Poland, Romania, Slovenia, Montenegro, Bosnia and Herzegovina, Serbia, India, Ireland, Czech Republic, Italy, Lithuania, Kosovo, Turkey, Belgium, Switzerland, USA, Slovakia, Macedonia, Cyprus, and the United Kingdom each contributing to the academic and professional discussion about contemporary management issues. The actuality and importance of the issues discussed, the international character of the book in terms of authors and topics, the highest standards of research methodology, and continuity in publishing have been recognized by the international academic community, resulting in the book of proceedings being indexed in world-known databases such as Clariavate Web of Science, EconLit, Thomson ISI, RePEc, EconPapers, and Socionet.

The latest edition, i.e., Interdisciplinary Management Research XIX / Interdisziplinäre Managementforschung XIX, encompasses 70 papers written by 148 authors from 7 countries. The success of former editions has echoed beyond the traditionally participative countries and authors.

As an editor, I hope this book will continue to encourage academic scholars and professionals to pursue excellence in their work and research and provide an incentive for developing various forms of cooperation among all involved in this project.

Aleksandar Erceg, Ph.D., Faculty of Economics and Business in Osijek

GENERAL MANAGEMENT

EFOS

THE EFFECTS OF COMMON TOPICS OF THE COURSE ENTREPRENEURSHIP ON STUDENTS' ENTREPRENEURIAL INTENTIONS

Elvira ĆATIĆ-KAJTAZOVIĆ, Ph.D.
University of Bihać, Faculty of Economics

E-mail: elvira.catic-kajtazovic@efbi.unbi.ba

Petra BARIŠIĆ, Ph.D.
University of Zagreb, Faculty of Economics & Business

E-mail: petra.barisic@net.efzg.hr

Mirela KLJAJIĆ-DERVIĆ, Ph.D.
University of Bihać, Faculty of Economics

E-mail: mirela.kljajic-dervic@efbi.unbi.ba

Abstract

This paper aims to examine the effects of common topics of syllabus content of the entrepreneurship course on entrepreneurial intention and its antecedents and whether these effects vary by students' participation in this course. Structural equation modeling and bootstrap procedure were used for data analysis. Data was collected from 603 university students (where 319 students participated in the course Entrepreneurship). Exploratory factor analysis (EFA) was performed for database research to determine the research instruments' dimensionality. A two-step structural equation modeling (SEM) approach was used to test potential mediator effects. There is a significant indirect effect of the syllabus content of the course Entrepreneurship on students' entrepreneurial intentions through attitude towards entrepreneurship and perceived behavioral control. There is a statistically significant difference in achieved mean values for all latent variables except for SNN in favor of students participating in

the course. However, results from the current study have shown no difference in assumed relationships in the final structural model when students who had participated are compared with those who had not participated in the course. The paper identifies topics that increase entrepreneurial intentions, which can be helpful for the development of educational programs. This opened a new field of research analyzing how other curriculum contents in entrepreneurial education programs may affect students' entrepreneurial intentions.

The current study consists of the following parts: literature review, research methodology (measures, research sample, and statistical analysis), results, discussion, and conclusion.

Keywords: *entrepreneurial intentions, intention antecedents, knowledge of the business environment, understanding the role of entrepreneurship*

JEL Classification: *I23, L26, M00*

1. INTRODUCTION

This paper follows the intention model of Icek Ajzen's Theory of planned behavior (TPB: Ajzen, 1991). In the present study, the impact of typical topics of the syllabus content in the Entrepreneurship course on students' entrepreneurial intentions will be measured through the three antecedents: attitudes towards entrepreneurship (ATE), subjective norms (SNN), and perceived behavioral control (PBC). The importance of all three intention antecedents in predicting intentions remains different (Fishbein & Ajzen, 2010; Karimi et al., 2014). According to Pham et al. (2023), while one group of studies confirms the positive influence of SNN on EI (Ahmed et al., 2020; Maresch et al., 2016; Shah et al., 2020), the other group does not (Duong, 2021; Tung et al., 2020). Research in B&H shows that SNN is not a statistically significant predictor of the entrepreneurial intention (EI) of "non-students" (Ćatić-Kajtazović & Kljajić-Dervić, 2020), nor is it a statistically significant predictor in the model of social-entrepreneurial intention of students at the University of Bihać (Ćatić-Kajtazović et al., 2022a).

The interest in measuring the influence of entrepreneurship education (EE) is mainly emphasized on entrepreneurial intention (Nabi et al., 2017). Regardless of the increased interest, limited research into the impact of EE on EI remains in developing countries (Soria-Barreto et al., 2017). In addition to the

above, as far as EE in higher education, there is "a general lack of consensus regarding what entrepreneurship education in higher education means (Pittaway & Cope, 2007), what needs to be learned, whether it can be learned, where it is best learned, how to learn it and how to measure if it has been learned "(Hatt, 2021: 216).

Bosnia and Herzegovina is a developing country (IMF) with an incomplete and fragmented offer of EE in higher education (Bičo Ćar et al., 2019). EE "represents a mixture of entrepreneurial learning, development of skills, and most important, and change in the way of thinking" (Sedlan-Konig, 2012: 3), while "the change in the way of thinking" will be the most difficult to achieve in Bosnia and Herzegovina (Ćatić-Kajtazović et al., 2015). Therefore, EE is essential in B&H because EE "not only provides human capital such as knowledge and skills but may also transform the attitudes and behaviors of students" (Wei et al., 2019: 1557).

When it comes to EE in higher education in B&H, according to Bičo Ćar et al. (2019: 109), EE "is available at business studies programs at state universities in Bosnia and Herzegovina, but that, on the other hand, this offer is incomplete and "fragmented" in the sense that there is no economics college in Bosnia and Herzegovina that offers the possibility of learning about entrepreneurship in all of its significant aspects.". This explains why the current study starts from having common topics in the Entrepreneurship course, which can be used to explore the relationship between EE and EI in higher education. Within the syllabus of the course Entrepreneurship (which is conducted at higher education institutions in B&H), several common topics can be identified: the role and importance of entrepreneurship, the preparation of a business plan, and financing and institutional support for entrepreneurial ventures. Therefore, the current study will examine the knowledge of the business environment (financing, law regulations, and institutional support) and an understanding of the role of entrepreneurship (in economic development, unemployment problem solving) as a part of standard topics in the Entrepreneurship course. Answering whether the student had participated in an entrepreneurship course allowed us to test the differences in the effects of typical topics of the Entrepreneurship course on EI. This was achieved by comparing the two groups of students: those who had participated in the course "as frequently used in entrepreneurship research "(Karimi et al., 2014: 703) and those who had not participated in the course.

According to Pham et al. (2023: 116), although recent studies show the importance of EE in predicting entrepreneurial intention (Ndofirepi, 2020; Shah et al., 2020), the research results are still inconsistent and unclear (Hassan et al., 2021; Otache et al., 2022). So testing the relationship among study variables by comparing two groups of students provides a more detailed insight into the role of EE in forming EI.

2. LITERATURE REVIEW

Hussain & Norashidah (2015) highlight a few published studies that provided empirical evidence of the impact of EE on entrepreneurial intentions: Galloway & Brown (2002), Fayolle et al. (2006), Zhang et al. (2013). Sharma and Madan (2014: 7) mention authors according to which entrepreneurship education is "critical for raising entrepreneurial intentions ": Kolvereid and Moen (1997), Noel (1998), Dyer (1995), Watson et al. (1998), Souitaris et al. (2007). Conversely, a meta-analysis by Martin et al. (2013) and Bae et al. (2014) discovered significant but small correlation coefficients between EE and EI. Still, as Bae et al. (2014) state, after controlling for pre-education entrepreneurial intentions, the relationship was not significant.

Therefore, although academic research states that EE increases EI, that impact is not equal (Maresch et al., 2016). Entrepreneurship and EE are primarily complex and multifaceted (Fellnhofer, 2017). Also, EE forms and appellations exist (Ndofirepi, 2020). "For example, Pittaway & Cope (2007) and Pittaway & Edwards (2012) recognize education 'for ', 'about ', 'through 'and 'in 'entrepreneurship" (Ndofirepi, 2020: 4/20). Likewise, Sedlan-Kőnig (2012) states that at least four categories of EE can be distinguished and that "each of these categories has a different focus and expected outcomes". Sedlan-Kőnig (2012: 144) explains the goals of these categories as follows: 'for '– "to understand entrepreneurs, train them to start and manage their own company "; 'about '- understand entrepreneurship, develop an awareness of the phenomenon of entrepreneurship and its role in society; 'in '– "train entrepreneurs to manage the growth and development of the company "; 'through '– "developing an entrepreneurial way of thinking and behavior." This explanation is conceptually closest to Mwasalwiba's (2010) review of entrepreneurship education. Namely, certain streams of thought exist in the relevant literature on approaches to the model 'about, for, in, or through' (Aadland & Aaboen, 2020). In addition to the above, although

this model ('about, for, in, or through') is "one of the most well-known classifications of entrepreneurship education...many scholars have combined the idea of education 'in 'and 'through 'entrepreneurship" (Aadland & Aaboen, 2020: 3/18). Considering the constant overlapping of the narrower (entrepreneurship as an exclusively economic process) and the broader meaning of the term entrepreneurship, there is also a difference in the definition of education 'for 'entrepreneurship (Luketić, 2021). In this line, as explained by Hatt (2021: 218; according to Lackéus, 2015), for students wishing to become entrepreneurs, the most relevant approaches are 'for' and 'about', while other approaches are helpful to any student.

Then, EE was measured using different constructs or a single item (e.g., the number of entrepreneurship courses each student had taken: Maresch et al., 2015). As an illustration, in the Pham et al. study (2023), "entrepreneurial education was assessed by using a four-item scale adopted from Walter and Block (2016)" (e.g., My school education helped me to understand the role of entrepreneurs in society better) in the study of Liu et al. (2022) were used "three items to assess entrepreneurship education "(e.g., How many lectures on entrepreneurship have you attended?, Kong & Zhao, 2017). According to Pham et al. (2023), few studies investigated the moderating role of EE, while more frequent studies investigated EE's direct and indirect effects. Also, in EI and entrepreneurial behavior studies, some studies considered EE as a controlled variable (e.g., Ćatić-Kajtazović et al., 2022b; Adeel et al., 2023).

As mentioned by Adeel et al. (2023: 4/12), "most studies on the impact of entrepreneurship education have specific methodological weaknesses, namely related to internal validity and external validity, which limit the generalization of findings, stressing the need for more empirical studies (Yi & Duval-Couetil, 2021)".

Conversely, the problem was already identified using different constructs to measure EI (see Thompson, 2009; Liñán & Chen, 2009). Such different constructs are still measured in different countries (the impact of cultural values cannot be forgotten, see Lee & Peterson, 2000; Urban et al., 2008). Unrelated to differences in countries, there are differentiated universities with different entrepreneurial university cultures (see Wang & Verzat, 2011).

Likewise, the Theory of planned behavior "is a work in progress as investigators continue to explore the intricacies of the structural model like moderating

effects of perceived behavioral control and to propose additional factors to account for the complexity of human behavior" (Bosnjak et al., 2020: 355).

The current study extends the literature on EE, EI, and applying TPB to EI in developing countries.

3. RESEARCH METHODOLOGY

3.1. Measures and Research Sample

The Entrepreneurial intention questionnaire (EIQ: Liñán & Chen, 2009) is used in the current study to measure entrepreneurial intention and antecedents of intention. EIQ questionnaire contains:

- Entrepreneurial intention (EI): "According to the TPB, entrepreneurial intention indicates the effort that the person will make to carry out that entrepreneurial behavior "(Liñán & Chen, 2009: 596). In the current study, EI has been measured through a Likert-type scale (from 1- total disagreement to 5 - total agreement) with five items (e.g., My professional goal is to become an entrepreneur).

- Attitudes towards entrepreneurship (ATE): "Attitude toward start-up (personal attitude, PA) refers to the degree to which the individual holds a positive or negative personal valuation about being an entrepreneur "(Liñán & Chen, 2009: 596). In the current study, ATE has been measured through a Likert-type scale (from 1- total disagreement to 5 - total agreement) with five items (e.g., Being an entrepreneur implies more advantages than disadvantages to me).

- Subjective norm (SNN): "Subjective norm (SN) measures the perceived social pressure to carry out—or not to carry out—entrepreneurial behaviors "(Liñán & Chen, 2009: 596). In the current study, SNN has been measured through a Likert-type scale (from 1-total disapproval to 5-total approval) with three items: If you decided to create a firm, would people in your immediate environment approve that decision? Your close family.

- Perceived behavioral control (PBC): "Perceived behavioral control (PBC) is defined as the perception of the ease or difficulty of becoming an entrepreneur "(Liñán & Chen, 2009: 596). In the current study, PBC

has been measured through a Likert-type scale (from 1- total disagreement to 5 - total agreement) with six items (e.g., If I tried to start a firm, I would have a high probability of success).

The Keat et al. study (2011) used fourteen items to measure the entrepreneurial curriculum and content (e.g., The course developed entrepreneurial knowledge and skills). Tsordia and Papadimitriou (2015) researched "the entrepreneurial curriculum and Content" with 13 items, "12 of which borrowed from Keat et al. (2011)". Students rated the extent to which they think that the courses "equip them with skills, experiences, capacities, knowledge, interest, and ideas related to entrepreneurship" (Tsordia & Papadimitriou, 2015: 30). In the current study, the syllabus of the course Entrepreneurship at three economics faculty in B&H was analyzed (Bihać, Tuzla, Sarajevo), and several common topics were identified: the role and importance of entrepreneurship; preparation of a business plan; and financing and institutional support for entrepreneurial ventures. Therefore, in the present study, students had to evaluate their knowledge of the business environment (e.g., I know basics about financing entrepreneurship ventures in B&H; I know which institutions should provide support and assistance in establishing a firm) as well as their understanding of the role of entrepreneurship and entrepreneurs in our society (e.g., I understand the role that entrepreneurs play in our society, Moberg et al., 2014; I understand the role of entrepreneurship in the economic development of B&H). All items have been measured through a Likert-type scale (from 1- total disagreement to 5 - total agreement).

The research was conducted in the period from May to June 2017. Respondents whose missing values exceeded 2% (Liñán & Chen, 2009) were excluded. The final sample from nine universities was 603 undergraduate students in Bosnia and Herzegovina (Male = 218, Female = 385). Three hundred nineteen students participated in the course Entrepreneurship, while 445 students attended one of the economics faculties (74.3%).

3.2. Statistical analysis

The Database was analyzed using SPSS 24 and AMOS 24. A two-step structural equation modeling (SEM) approach was used to analyze the research model. The first step was to assess the measurement model, and the second was to assess the proposed structural model (Anderson & Gerbing, 1988). Maxi-

mum likelihood estimation of structural equation modeling was used for all analyses. The goodness-of-fit indices and the construct validity criteria were used to assess measurement model validity (Hair et al., 2014). For examining goodness-of-fit indices, several indices (which provide sufficient information to evaluate the model's fit) were used, including the chi-square statistic ($\chi 2$) and degrees of freedom (df), comparative fit index (CFI), and root mean square error of approximation (RMSEA) (Hair et al., 2014). Due to the number of sample participants (> 400), as well as the number of items, for assessing the model's fit, the values used are $\chi 2/df < 5$ (the chi-square to degrees of freedom ratio); CFI > 0.90; RMSEA < 0.08 (Hair et al., 2014).

Because "noninvariance of a construct across groups or measurements can lead to erroneous conclusions" (Putnick & Bornstein, 2016), three steps were used for testing measurement invariance: configural invariance (exists if the baseline model has a good fit), metric invariance (exists if the factor loadings are the same, invariant), scalar invariance (exists, besides metric invariance, if the intercepts are the same across groups) (Comșa, 2010). To test whether the relationship between independent variables and the dependent variable is mediated through entrepreneurial intention antecedents, the bias-corrected bootstrapping method with 95% confidence interval estimates and 2,000 resamples were used (Shrout & Bolger, 2002; Mallinckrodt et al., 2006). A two-group SEM analysis (Byrne, 2010; Karimi et al., 2014) was used to examine whether the groups differed at the final structural model level. According to Ryu & Cheong (2017), the multi-group analysis approach has advantages over the single-group approach in incorporating a categorical moderator in the model. "The multi-group approach does not depend on the assumption of equal variances, and so the parameter estimates and statistical inferences are not affected by the assumption satisfied or violated" (Ryu & Cheong, 2017).

4. RESULTS

Twenty-five questionnaire items were the subject of the exploratory factor analysis (EFA). One item (PBC2) was loaded onto two factors (ATE and PBC). Hence the EFA has been repeated with 24 items. Six variables were formed, and they explain 68.38% of the variance; KMO is high (0.93), which also shows a high significance of Bartlett's Test of Sphericity ($\chi^2 = 10410.60$; df = 276; p < 0.05). All items have factor loading above 0.5.

Table 1. Mean, SD, skewness, kurtosis, Cronbach's alpha, a correlation between study variables, and differences between study variables considering whether students participated in the course Entrepreneurship

	Mean (SD)	Skew (SE)	Kurtosis (SE)	Cronbach's alpha	EI	ATE	PBC	SNN	ENV	ROLE
EI	3.50 (1.01)	-0.29 (0.10)	-0.45 (0.20)	0.95	1					
ATE	3.93 (0.88)	-0.82 (0.10)	0.55 (0.20)	0.92	0.73**	1				
PBC	3.26 (0.83)	-0.13 (0.10)	0.01 (0.20)	0.88	0.64**	0.62**	1			
SNN	4.17 (0.85)	-1.14 (0.10)	1.04 (0.20)	0.79	0.24**	0.35**	0.27**	1		
ENV	3.04 (0.95)	-0.01 (0.10)	-0.42 (0.20)	0.85	0.36**	0.34**	0.49**	0.18**	1	
ROLE	3.79 (0.86)	-0.44 (0.10)	0.09 (0.20)	0.84	0.26**	0.37**	0.24**	0.28**	0.33**	1
Mean for students who had participated in the course Entrepreneurship (Std. Deviation)					3.60 (0.96)	4.07 (0.81)	3.35 (0.78)	4.21 (0.80)	3.15 (0.89)	3.93 (0.80)
Mean for students who had not participated in the course Entrepreneurship (Std. Deviation)					3.39 (1.05)	3.78 (0.94)	3.17 (0.86)	4.12 (0.91)	2.91 (1.00)	3.62 (0.85)
t					2.549*	4.123**	2.576*	1.305	3.115**	4.640**

Notes: *$p < 0.05$; **$p < 0.01$.
Source: Authors' calculations.

Statistically significant correlations were low to high in their strength and lay between $r = 0.18$ and $r = 0.73$ with positive directions of the relationships. As seen in Table 1, students who had participated in the course have a higher intensity of entrepreneurial intentions ($t = 2.549$, $p < 0.05$); a higher level of attitudes towards entrepreneurship ($t = 4.123$, $p < 0.01$); higher level of perceived behavioral control ($t = 2.576$, $p < 0.05$); higher level of knowledge of the business environment ($t = 3.115$, $p < 0.01$) and a higher level of understanding the role of entrepreneurship ($t = 4.640$, $p < 0.01$) compared to a student who had not participated in the course. However, there is no difference in subjective norms between these two groups.

For testing the proposed *measurement model*, confirmatory factor analysis (CFA) was performed with six latent variables (all latent variables to be correlated freely). The measurement model provided a reasonable fit for the data: $\chi^2/df = 2.925$; CFI = 0.956; RMSEA = 0.057, even though the chi-square statis-

tic was significant (χ^2 = 693.340; df = 237; p < 0.001). As can be seen in Table A1 in the appendix, the results support the *convergent, discriminant, and nomological validity* of the measurement model. All factor loadings are statistically significant and greater than 0.50; the average variance extracted (AVE) for the variables is above 0.50; composite reliability (CR) is greater than 0.70; results of maximum shared squared variance (MSV) is less than the AVE, and the square root of the AVE is greater than the correlations between latent variables (Hair et al., 2014). Also, all latent variables correlated significantly and positively with each other (p < 0.05).

The measurement model was tested separately for two groups of students to test measurement invariance. Group 1 included students who had participated in an Entrepreneurship course, while Group 2 involved the rest of the students who had not participated in the course. Results show good model fit, for Group 1: χ^2 = 487.660; df = 237; χ^2/df = 2.058; CFI = 0.952; RMSEA = 0.058, for Group 2: χ^2 = 485.518; df = 237; χ^2/df = 2.049; CFI = 0.950; RMSEA = 0.061, hence the measurement model is supported in both groups, while the factor loadings range from 0.60 to 0.91 for Group 1, and from 0.59 to 0.93 for Group 2. Furthermore, the same two groups were created in AMOS, and several models were run, as seen in Table 2.

Table 2. Results from the analysis of measurement invariance across two groups of students

Model	χ^2	df	χ^2/df	CFI	RMSEA	Model comparison	$\Delta\chi^2$	Δdf	p	ΔCFI
Baseline	973.189	474	2.053	0.951	0.042	-				
Model 1	993.840	492	2.020	0.951	0.041	Model 1 - Baseline	20.651	18	0.297	0.000
Model 2	1057.18	516	2.049	0.947	0.042	Model 2 – Model 1	63.341	24	0.000	0.004

Note. The baseline model (both groups are tested together and freely without cross-group constraints). Model 1 (all item-factor-loadings were constrained to make them equal across two groups). Model 2 (the factor loadings and the item intercepts were constrained to be equal across groups).
Source: Authors' calculations.

The results show that the goodness-of-fit indices for the baseline (unconstrained) model are χ^2/df = 2.053; CFI = 0.951; RMSEA = 0.042, so the model achieves good fit, and configural invariance is supported. The P-value for the chi-square difference test between the baseline and Model 1 is higher than 0.05 (p = 0.297, p > 0.05), and the change value of CFI is less than 0.01

(Cheung & Rensvold, 2002), indicating a factor loading (metric) invariance between these groups (Byrne, 2010). It can be concluded that the constructs have the same meaning for the two student groups. The chi-square difference test between Model 1 and Model 2 is significant (p = 0.00, p < 0.05), which means that scalar invariance is not supported. However, the change value of CFI is less than 0.01 (ΔCFI = 0.004), meaning that scalar invariance is supported (Byrne, 2010). In such cases, researchers are left to choose which results to accept (Byrne, 2010). According to the traditional criteria, scalar invariance is supported ("the traditional criteria of -0.01 for ΔCFI and 0.01 for ΔRMSEA were appropriate for scalar invariance tests" Putnick & Bornstein, 2016).

Latent mean structure analysis was performed following the steps to set up the model constraints for latent mean structure analysis in AMOS (Byrne, 2010). All item-factor-loadings and factor intercepts were constrained to make them equal across two groups. For Group 1, students who had participated in the course, the means of its latent variables were constrained to 0.0 (the reference group). Since the latent mean estimates are negative and estimates are significant (CR > 1.96) for all latent variables except for SNN (CR = -1.084, p = 0.278, p > 0.05), the results show that the latent mean structure analysis confirms the results presented in Table 1 about the existence of statistically significant difference in achieved mean values for all latent variables except for SNN.

The proposed structural model was designed to test relationships among latent variables. Withdrawing covariance among knowledge of the business environment and understanding the role of entrepreneurship, the overall goodness-of-fit statistics results were: χ^2/df = 3.777; CFI = 0.935; RMSEA = 0.068. The proposed structural model acceptably fits the data and explains about 61% of the variance in EI (R^2 = 0.61). Knowledge of the business environment and understanding the role of entrepreneurship explains about 37% of the variance in PBC (R2 = 0.37) and about 26% in ATE (R^2 = 0.26). Direct, indirect, and total effects in the proposed structural model are presented in Table 4 for all students.

For testing the difference between the models for the students who had participated versus students who had not participated in the course, we used *a two-group SEM analysis* (Byrne, 2010; Karimi et al., 2014). The chi-square difference test and the change value of CFI were used and compared: the baseline model-both groups are tested together and freely without any cross-group con-

straints (χ^2/df = 2.474; CFI = 0.931; RMSEA = 0.050); model 1-all structural regression paths between latent variables were constrained to be equal across the two groups (χ^2/df = 2.449; CFI = 0.930; RMSEA = 0.049), the model 2-all structural regression paths were constrained to be equal across the two groups (χ^2/df = 2.390; CFI = 0.931; RMSEA = 0.048). Since the chi-square has proved insignificant (p > 0.05) and ∆CFI < 0.01, it can be concluded that there is no difference in assumed relationships of the final structural model when students who had participated are compared with the students who had not participated in the Entrepreneurship course. *The groups are not different at the model level.*

Table 3. Model comparison

Model	χ^2	df	χ^2/df	CFI	RMSEA	Model comparison	∆χ^2	∆df	p	∆CFI
Baseline	1187.675	480	2.474	0.931	0.050	Model 1 - Baseline	14.550	11	0.204	0.001
Model 1	1202.225	491	2.449	0.930	0.049	Model 2 – Baseline	28.759	29	0.478	0.000
Model 2	1216.433	509	2.390	0.931	0.048	Model 2 – Model 1	14.209	18	0.715	0.001

Source: Authors' calculations.

Table 4. Direct, indirect, and total effects in the proposed structural model

Outcome	Determinant	All students				Students who participated in the Entrepreneurship course				Students who had not participated in the Entrepreneurship course			
		Effects			R²	Effects			R²	Effects			R²
		Direct	Indirect	Total		Direct	Indirect	Total		Direct	Indirect	Total	
EI	ATE	0.65**		0.65**	0.61	0.61**		0.61**	0.55	0.69**		0.69	0.66
	SNN	-0.03		-0.03		-0.02		-0.02		-0.03		-0.03	
	PBC	0.33**		0.33**		0.32**		0.32**		0.32**		0.32	
	ENV	0.01	0.39**	0.40**		0.01	0.37**	0.39**		0.02	0.38**	0.40	
	ROLE	-0.06	0.22*	0.16*		-0.06	0.21**	0.16*		-0.06	0.22**	0.16	
ATE	ENV	0.32**		0.32**	0.26	0.32**		0.32**	0.28	0.29**		0.29	0.21
	ROLE	0.30**		0.30**		0.31**		0.31**		0.28**		0.28	
PBC	ENV	0.57**		0.57**	0.37	0.56**		0.56**	0.37	0.57**		0.57	0.37
	ROLE	0.10		0.10		0.10		0.10		0.10		0.10	
SNN	ENV	0.10		0.10	0.12	0.11		0.11	0.13	0.10		0.10	0.10
	ROLE	0.29**		0.29**		0.30**		0.30**		0.28**		0.28	
Goodness-of-fit indices		χ²/df = 3.777; CFI = 0.935 RMSEA = 0.068				χ²/df = 2.449; CFI = 0.930; RMSEA = 0.049							

Notes: *p < 0.05; **p < 0.01.

Source: Authors' calculations

5. DISCUSSION

In the current study, the direct effect of SNN on EI is insignificant. This result is consistent with several previous studies (e.g., Tran et al., 2023; Krueger et al., 2000; Liñán & Chen, 2009), but at the same time, it is opposed to some other studies (e.g., Souitaris et al., 2007; Gird & Bagraim, 2008). The results of the current study are consistent with the results group of studies in B&H that did not confirm that SNN is a statistically significant direct predictor of EI (Ćatić-Kajtazović et al., 2022a; Ćatić-Kajtazović & Kljajić-Dervić, 2020). Also, the highest mean score (mean = 4.17) is for SNN, especially for the item: "If you decided to create a firm, would people in your immediate environment approve that decision? - Your close family "(mean = 4.52). Such results can be explained by strong family relationships in B&H that are strongly affected by tradition and conservatism, not neglecting the influence of the former socialist system. According to Podrug et al. (2006), Bosnia and Herzegovina is characterized by tradition, conservatism, and the importance of religion.

ATE is the most important predictor of students' entrepreneurial intentions, contrary to what Karimi et al. (2014) found, but in line with Gird & Bagraim (2008), who reported that ATE is the best predictor of students' EI. ATE is a more significant predictor than PBC in the previous study in B&H (Ćatić-Kajtazović et al., 2022c). At the same time, PBC is a more significant predictor than ATE in the social-entrepreneurial intention model among students at the University of Bihać (Ćatić-Kajtazović et al., 2022a). However, the results of the present study confirmed the results of the study that applied the TPB to entrepreneurial intention among university students in Spain and Taiwan (Liñán & Chen, 2009), although only with students from Spain. It seems reasonable to accept Liñán and Chen's (2009: 610) explanation of the higher uncertainty avoidance in Spain. The national culture of B&H is characterized by high uncertainty avoidance (Podrug et al., 2006; Hofstede Insights, 2021). Thus the results from the current study can be explained by B&H's national culture. Moreover, PBC has a lower mean score (mean = 3.26) than ATE, SNN, and EI.

There is a statistically significant difference in achieved mean values for all latent variables except for SNN-favoring students participating in the course. These results support the claim of "the usefulness of entrepreneurial intention as an indicator of the effectiveness of entrepreneurial education programs" (Ndofirepi, 2020).

As seen in Table 1, statistically significant correlations exist between the knowledge of the business environment (ENV) and EI (r = 0.36), ENV and ATE (r = 0.34), and ENV and PBC (r = 0.49). Malebana (2014) found that knowledge of entrepreneurial support is significantly related to ATE, PBC, and EI. This knowledge Malebana (2014) measured with five items (e.g., I know the different types of support offered to people who want to start new businesses), while "questions on entrepreneurial support were developed by Zanakis et al. (2012) and Liao & Welsch (2005)" (Malebana, 2014: 1023). In the current study, ENV also contains a question of institutional support. Therefore, it can be concluded that this study supports the findings regarding the importance of knowledge of entrepreneurial support.

The proposed structural model results have shown that knowledge of the business environment affects only ATE and PBC, while understanding the role of entrepreneurship affects only ATE and SNN. The knowledge of the business environment and understanding of the role of entrepreneurship explains around 37% of the variance in perceived behavioral control. Results from Table 4 showed a significant standardized total effect of knowledge of the business environment (ENV) on EI (when ENV goes up by one standard deviation, EI goes up by 0.40 standard deviations). The results of the current study suggest a greater focus on financing entrepreneurship ventures, law regulation, and institutional support in the syllabus of the Entrepreneurship course. The following study results support this suggestion. According to Malebana (2017: 87), there is a "need for more knowledge about the types of support required by intending entrepreneurs to implement their entrepreneurial intentions." The study of Tran et al. (2023) shows that financial knowledge (as general knowledge) has a more substantial impact on EI than EE (as specific knowledge), while Drobnik (2019: 10) claims that "knowledge of legal regulations plays an essential role at the establishment stage and during the functioning of the enterprise."

Considering that ENV and ROLE represent self-evaluation of the knowledge, not the actual knowledge, it is possible that students who participated in the course scored higher because they believe they know it, not because they know more. However, the groups are not different at the model level. That further means that regardless of participation in the course, understanding the role of entrepreneurship (ROLE) and knowledge of the business environment (ENV) significantly indirectly affects students' entrepreneurial intentions. As claimed by Bičo Ćar et al. (2019: 108), "study programs at universities in Bosnia

and Herzegovina have numerous subjects that, in different ways, deal with issues of importance of entrepreneurship." Based on the above, we can explain the results that the common topics of the Entrepreneurship course indirectly influence EI, regardless of whether students participated in the Entrepreneurship course. At the same time, "the self-evolution of knowledge" is a limitation of the current study, and it is recommended to use research instruments that will try to measure actual knowledge.

A limitation of the study is testing only one part of the syllabus content of the course Entrepreneurship. Hence it is recommended to continue the study of the impact of other topics (e.g., from the syllabus of the course Entrepreneurship Faculty of Economics in Tuzla: feasibility analysis, developing an efficient business model, primary forms of starting a business). The research focus needs to be shifted in search of content and other courses to increase entrepreneurial intentions. After determining such content, special attention should be paid to discovering teaching methods to increase entrepreneurial intentions.

An additional limitation of the research is the lack of a strong theoretical basis for establishing a connection between the researched topics in the course entrepreneurship and entrepreneurial intentions.

6. CONCLUSION

The primary purpose of the current study was to examine the effects of common topics of the course Entrepreneurship on EI and its antecedents and to examine whether the effects vary among students who had participated and those who had not participated in the course. Students who had participated in the course have a higher intensity of entrepreneurial intentions, higher level of attitudes towards entrepreneurship, higher level of perceived behavioral control, higher level of knowledge of the business environment, and a higher level of understanding of the role of entrepreneurship; compared to students who had not participated in the course. However, there is no difference in subjective norms between these two groups. Based on direct associations from the final structural model, it can be concluded that understanding the role of entrepreneurship has an indirect effect on EI only through ATE. In contrast, knowledge of the business environment indirectly affects EI through ATE and PBC.

There is no difference in assumed relationships of the final structural model when students who had participated are compared with those who had not participated in the Entrepreneurship course. The groups are not different at the model level.

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Table A1. Results of confirmatory factor analysis for the hypothesized model

Latent variable	Items	Stan-dardized factor loading	T-value (critical ratio)	CR	AVE	MSV	EI	ATE	SNN	PBC	ENV	ROLE
EI	EI1	0.82		0.95	0.78	0.60	**0.88**[a]					
	EI2	0.87	26.49									
	EI3	0.91	28.74									
	EI4	0.92	28.93									
	EI5	0.90	27.99									
ATE	ATE1	0.75		0.92	0.69	0.60	0.77***	**0.83**				
	ATE2	0.82	20.98									
	ATE3	0.87	22.56									
	ATE4	0.90	23.35									
	ATE5	0.81	20.57									
SNN	SNN1	0.60		0.81	0.60	0.13	0.25***	0.35***	**0.77**			
	SNN2	0.94	14.05									
	SNN3	0.75	14.35									
PBC	PBC1	0.69		0.88	0.60	0.46	0.68***	0.67***	0.28***	**0.78**		
	PBC3	0.82	18.36									
	PBC4	0.83	18.55									
	PBC5	0.82	18.38									
	PBC6	0.70	15.82									
ENV	ENV1	0.79		0.85	0.66	0.32	0.40***	0.38***	0.18***	0.,57***	**0.81**	
	ENV2	0.82	19.90									
	ENV3	0.82	19.81									
ROLE	ROL1	0.84		0.86	0.67	0.15	0.27***	0.40***	0.32***	0.28***	0.37***	**0.81**
	ROL2	0.85	20.88									
	ROL3	0.72	18.20									

*** Correlation is significant p < 0.001 (2-tailed); [a]the square root of AVE estimate in bold on the diagonal
The square root of AVE, MSV, AVE, and correlation has been calculated using the tool by Gaskin and Lim (2016).
Source: Authors' calculations.

BRIDGING THE GAP: MAPPING THE SERVICES OF BUSINESS SUPPORT INSTITUTIONS FOR SMEs

Anamarija DELIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: anamarija.delic@efos.hr

Magdalena ORLOVIĆ, student
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: morlovic99@gmail.com

Abstract

Business support institutions (BSIs) are significant players in the entrepreneurial ecosystem in Croatia. Their role is to strengthen and develop the small and medium enterprise (SME) sector and contribute to the system's creation. Although the number of BSIs is increasing yearly, the number alone does not guarantee the provision of quality services to SMEs. This paper aims to critically review and analyze existing BSI services from the perspective of SME owners and managers of BSIs, but also in the context of a broader picture - the entrepreneurial ecosystem. The research design combined various methods - from in-depth analysis of critical strategic documents for SME development in Croatia to interviews with SME owners and managers of BSIs, especially business centers. The collected data was used to compare the services BSIs provide to SMEs with the services that SMEs highlight as most important for their growth and development. The gap identified points to the creation of services that better meet the needs of Croatian SMEs and the creation of better policies for developing the SME sector.

Keywords: small and medium-sized enterprises, business support institutions, technical assistance, consulting services

JEL Classification: M21

1. THE ROLE OF THE ENTREPRENEURIAL ECOSYSTEM IN THE DEVELOPMENT OF THE SME SECTOR

The SME sector is considered a generator of new jobs, innovation, exports, GDP, and ultimately the prosperity of any economy (Wong et al., 2005; Mason & Brown, 2013; Alpeza et al., 2022). According to Bernandez (2009), economies that have failed to secure conditions for the development of the SME sector fall significantly behind. These conditions are defined by Prahalad (2005: 65) as *"a framework that allows private sector and social actors, often with different traditions and motivations and of different sizes and areas of influence, to act together and create wealth in a symbiotic relationship."* Bernandez (2009) sees these conditions as an *"umbrella"* that enables all actors to work together. Harrington (2017: 127) points out that SME sector development requires a *"mix of top-down strategy (economic development), wealth creation initiatives (enterprise development), and bottom-up efforts (entrepreneurial development)."* These conditions will create an environment of collaboration and cooperation that Stam (2015) calls entrepreneurial ecosystems.

The term ecosystem is inspired by the biological concept defined as *"the complex of living organisms, their physical environment, and all their interrelationships in a particular unit of space"* (Encyclopedia Britannica). The concept of the entrepreneurial ecosystem *"emphasizes that entrepreneurship takes place in a community of interdependent actors"* (Stam, 2015: 1).

Entrepreneurial ecosystems are *"groups of interdependent actors and factors that are coordinated to enable productive entrepreneurship in a given area"* (Harrington, 2017: 1765). The author sees entrepreneurial ecosystems as a platform for stimulating economic development, innovation, and social change. Qian et al. (2012: 561) view entrepreneurial ecosystems as *"economic, social, institutional, and all other important factors that interactively influence the creation, discovery, and exploitation of entrepreneurial activities."* Entrepreneurial ecosystems should provide coordinated activities among various actors that ensure conditions for creating and developing successful SMEs (Kuratko, 2017).

To create conditions stimulating entrepreneurial activities, all activities should be coordinated and transparent. Harrington (2017) states that this is crucial for developing a thriving entrepreneurial ecosystem. Therefore, he proposed a general map, an inventory framework, that represents 12 overlapping

sectors based on the activity stage and type of development. The framework refers to the need for coordination of activities and the position of different actors in the ecosystems. On the other hand, the framework provides insights into different activities for entrepreneurs at each stage of development.

To measure and compare ecosystems, Stangler and BellMasterson (2015) propose four factors: Density, fluidity, connectivity, and diversity. Density represents the number of new and young enterprises and the percentage of people employed in those businesses. Fluidity can be defined as population fluctuation, labor market reallocation and number of growing enterprises. Connectivity shows how connected and coordinated programs and activities are among different actors and stakeholders, and diversity provides data on economic diversification, immigration, and mobility.

Figure 1. Most common activities at different stages of SME development in the business ecosystem
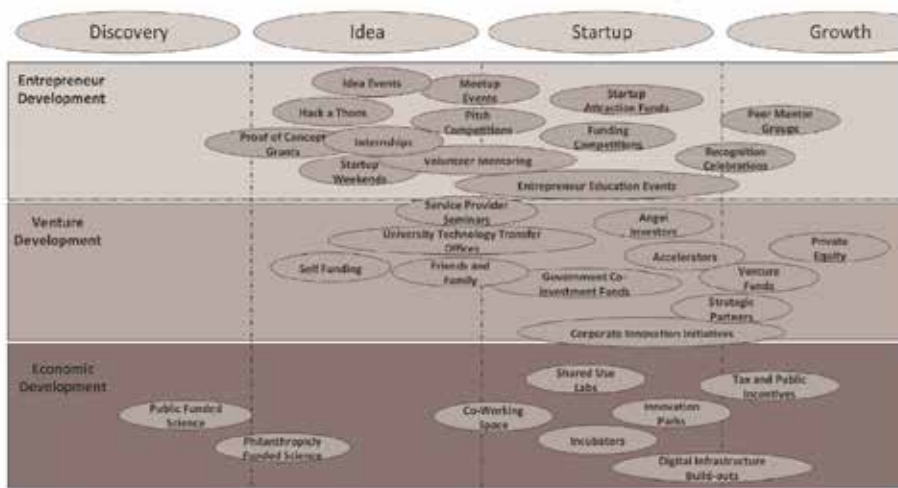
Source: Harrington, 2015: 129

To find an answer to the question of how efficient the services that BSIs provide, it is necessary to describe the context and the environment in which they operate. The primary strategic documents and reports (Global Entrepreneurship Monitor and SME Report) will be used to measure the entrepreneurial system's efficiency. The reports will also provide data for measuring the Croa-

tian entrepreneurial ecosystem using Stangler and BellMasterson (2015) four factors: Density, Fluidity, Connectivity, and Diversity.

The second step of the research will use interviews with five entrepreneurs across Croatia, but also at different stages of development, different sizes, and in different industries to evaluate BSI's services and capture attitudes towards the services BSI provides. The third step will provide an overview of the research questions from the perspective of directors/managers of BSIs, especially business centers. Interviews will be conducted with three directors of business centers in Croatia (differentiated by size, number of employees, and years of operation). Finally, an overall overview of the role and effectiveness of BSI's services will be given.

The paper is divided into six chapters. The introductory part contains a definition of the entrepreneurial ecosystem and a description of the research design. The second chapter gives an overview of the entrepreneurial ecosystem in Croatia but also a comparison with other ecosystems. The third part of the paper describes the methodology used in the paper for the analysis of the Croatian ecosystem, but also for the attitudes of entrepreneurs and business center managers. The results from the interviews, but also the analysis and comparison of the Croatian entrepreneurial ecosystem, are discussed in the results chapter. Final thoughts and recommendations for creating better services for SMEs and for capacity building of BSIs can be found in the concluding part.

2. ROLE OF BUSINESS SUPPORT INSTITUTIONS

The literature review did not reveal a uniform or generally accepted definition of BSI. One of the definitions that might be accepted in different ecosystems could be that BSIs are a set of institutions and organizations that are important for the functioning of all economic entities (Przygodzki, 2007). Leonski (2022: 584) sees BSIs as "*organizations that provide support services (and are particularly focused on the SME sector),*" while Beck et al. (2005: 203) emphasize that BSIs are institutions whose goal is to "*remove institutional constraints and enable SMEs to operate more efficiently, leading to productivity growth.*" The fundamental goal of BSIs is to help entrepreneurs overcome challenges posed by the economic, social, and physical environment of SMEs (European Commission, 2016). According to Cravo and Piza (2019), the role of BSI is to help SMEs reach their full potential (jobs, profits, economic growth). According to

Ochoa et al. (2018), BSIs are institutions involved in creating and managing new businesses.

BSIs offer different types of support: Training and workshops, counseling, promotion, financial assistance, information, and business contacts (Leonski, 2022). Wren and Storey (2002) point out the valuable role of technical expertise that BSIs provide to SMEs. Spence et al. (2003) emphasize the importance of consulting for SMEs, which provides a more holistic view and ensures an effective development process. Consulting is especially needed when difficult situations (bottlenecks) must be overcome or when a strategic view of the market or the organization's development potential is required (Ramsden, Bennett, 2005).

Much research shows the importance of using BSI services for SME development, growth, turnover, and employment. SMEs are more likely to survive using BSI services (Wren & Storey, 2002; Arenius & De Clercq, 2005; Park et al., 2019).

While the benefits of business service providers' services are undisputed, the frequency of using them is still a much-debated question. Owner/managers of SMEs tend to rely more on banks and auditors (Berry et al., 2006; Audet & St-Jean, 2007; Park et al., 2019; Delić & Alpeza, 2021). One of the explanations found by Curran and Blackburn (2000) and Audet and St-Jean (2007) is a lack of trust in institutions.

These researchers identified five factors that significantly influence the decision to use BSI support/consultancy: lack of trust in support agencies, poor quality of services, poor match between services offered by BSI and services needed by SMEs, poor marketing of services, and high service prices. These factors are confirmed by Blackburn and Jarvis (2010), who point to competence, trust, proximity, and responsiveness as the most critical factors in the relationship between SMEs and external consultants. SMEs that have been in the market and a particular industry for a more extended period are more likely to rely on their own experience and network, according to Jay and Schaper (2003), while Audet and St-Jean (2007) did not demonstrate any relationship between SME size and the frequency of using BSI services.

Previous research (Murphy, 1999; Adamson, 2000; Berry et al., 2006) has also shown that business consultants came from the local area (80% from within 25 km) and that SMEs that used BSI services grew faster than others.

One of the objectives of this paper is to find out the opinion of the owners/managers on the services offered by BSIs, especially in the business centers, since they have to offer technical support to SMEs. Five interviews were conducted to find out how often and what kind of services SMEs usually use. Since there are different research findings on the size and experience of SMEs and the likelihood of using BSI services, the companies in the sample differed in size, stage of development, and experience in the industry and market.

3. BUSINESS SUPPORT INSTITUTIONS IN CROATIA

BSIs are considered and analyzed in the GEM report as part of the professional and commercial infrastructure, which consists of various institutions that "provide various business services (from training and advice for business creation and growth to networking with various investors and preparing investment projects)" (Singer et al., 2022: 70). This broad definition covers all activities that BSIs provide to the SME sector and is therefore appropriate for this research. The Croatian Act on the Promotion of Entrepreneurial Infrastructure (Croatian Official Gazette 93/13, 114/13, 41/14, 57/18, and 138/21) defines the role and purpose of entrepreneurial infrastructure. According to the Act, the purpose of developing and improving entrepreneurial infrastructure is to promote economic growth through the planning and timely construction of entrepreneurial infrastructure, which in turn serves the balanced regional development of the Republic of Croatia, faster growth of entrepreneurship, and increased investment and employment in the area where entrepreneurial infrastructure is planned or constructed. The Act divides entrepreneurial infrastructure into two categories: entrepreneurial zones and BSI. BSIs are, according to the same Act, local and county development agencies, industrial development agencies, business centers, digital innovation centers, business incubators, business incubators, new technology incubators, business accelerators, business and science-technology parks, and competence centers.

Table 1. Role and tasks of BSIs in Croatia

Type of the business support institution	Role and task of the BSI
Development agency	Registered legal entities responsible for the operational implementation of economic development and entrepreneurship policies at the local (regional) and national levels, promoting and attracting investment, and initiating and implementing projects to promote economic development and entrepreneurship, combining the work of enterprises, local and regional entrepreneurial institutions, and higher education institutions and knowledge centers.
Business center	Registered legal entities responsible for the operational implementation of measures for the development and promotion of entrepreneurship in the local and/or broader environment (district, region) and which are centers for professional and educational support of entrepreneurs for the development of entrepreneurship in their environment
Business incubator	They registered legal entities that help and support entrepreneurs in the initial stages of developing entrepreneurial projects. Incubators provide professional technical and educational support for creating entrepreneurial projects and companies and their rapid and sustainable development.
Entrepreneurial incubator	Provide support for the successful development of entrepreneurship through a range of business services and resources, including business (work) spaces on more favorable terms for startup entrepreneurs from the first to the third year of operation
New technology incubator	Represent specialized business entities with a thematic focus and focus on areas of new (high) technology that support the startup and growth of innovative companies through incubation programs and provide innovative startup companies with a similar profile and interest with the resources and professional services necessary for growth and development.
Business accelerator	Registered legal entities, i.e., specialized companies that provide support to entrepreneurs in the post-incubation phase, i.e., in the phase of development and expansion of the company in the domestic and foreign markets.
Business park	Registered legal entities with physical premises, land and resources for the accommodation of small, medium and large entrepreneurs on a commercial basis, with a particular focus on attracting domestic and foreign investment
Science-technology park	Parks are commercial enterprises established to commercialize scientific results, promote cooperation between scientists and entrepreneurs, and comply with Article 30 of the Law on Scientific Activities and Higher Education.
Competence center	Specialized economic entities that carry out research projects of a developmental or production nature and develop competencies in specific areas, with which other economic entities can contract research and development services to strengthen specific industries. They are aimed at the development and applied research and its commercialization, as well as at supporting and strengthening intellectual property in specific subject areas and areas of expertise.

Source: Official Croatian Gazette 93/13, 114/13, 41/14, 57/18 and 138/21, Article 4

The basis of the new BSI is defined in strategic documents. The National Development Strategy 2030 calls for developing a sustainable economy and resilient enterprises that will lead to a more competitive economy. The National

Development Strategy was adopted in 2021, and new action plans with detailed measures to achieve the strategic goals must be prepared and achieved.

All BSIs and entrepreneurial zones are registered in the unique Register of Entrepreneurial Infrastructure, managed by the Ministry of Economy and Sustainable Development. The register provides information on the number of BSIs and basic information.

Table 2. Number of BSI and Entrepreneurial zones in Croatia

Type of the institution	Number of institutions in 2019	Number of institutions in 2023
Entrepreneurial zones	273	315
Development agencies (local, county, for specific industry)	77	78
Incubators (business, new technology)	54	61
Business accelerators	9	15
Parks (business, science- technology)	2	2
Business center	50	55
Competence center	8	8
Total	473	534

Source: Unique register of entrepreneurial infrastructure, http://reg.mingo.hr/pi/public/#

The number of all BSI and entrepreneurial (business) zones is increasing yearly. The Croatian Ministry of Economy and Sustainable Development offers financial support to local authorities to develop a network of BSIs and zones. Existing BSIs can apply for financial support every year to manage daily activities. BSIs in Croatia are established by the national or local government, and therefore, their activities are usually not closely related to SMEs and other businesses.

Croatia's entrepreneurial ecosystem quality has been measured since 2002 and compared with other countries in the world's most extensive study on entrepreneurship - Global Entrepreneurship Monitor (GEM). A detailed description of all the actors in the ecosystem can be found in the SME Report. Both reports provide insights and the opportunity to compare Croatia with other entrepreneurial ecosystems.

Table 3. Perception of quality of commercial and professional infrastructure in Croatia[1]

Commercial and professional infrastructure	Grade 9 shows:	2019.		2020.	
		EU average	Croatia	EU average	Croatia
	There are consultancy, legal and accounting services, and business entities that can afford them; their quality is high.	5.25	4	5.35	4.62

Source: CEPOR, 2022

One of the most commonly used measures of the entrepreneurial ecosystem is the National Entrepreneurship Context Index (NECI). The NECI measures the quality of the entrepreneurial ecosystem using a Likert scale of 0-10, with a score of 5 as the dividing line between an entrepreneurial environment that is stimulating or constraining. This provides insight into the evolution and dynamics of the state's entrepreneurial environment.

Table 4. NECI index results for Croatia in comparison with other EU countries

Year	Croatia	EU countries	
		Average/The best grade	Rank Croatia
2019	3.6	4.6/6.0 Netherlands	17/17
2020	3.7	4.6/6.3 Netherlands	14/14
2021	3.9	4.6/9.3 Netherlands	19/19

Source: CEPOR, 2022

Although the Croatian entrepreneurial ecosystem offers several BSIs that provide their services to all firms, other measures of the entrepreneurial ecosystem are low and show opportunities for creating better services that would better meet the needs of Croatian firms. Singer et al. (2022) conclude in their report GEM that the number of BSIs does not guarantee service quality and that all actors in the entrepreneurial ecosystem should harmonize their services. There is a need for improvement, but it requires time and significant changes - changes in infrastructure, people with expertise, or internal procedures. For significant changes, time is of the essence.

The same conclusions were reached in a BSI study conducted as part of the Business Organizations Network Development (BOND) project, which

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[1] Data for 2021. were not available in May 2023

the Croatian Agency implemented for SMEs, Innovation and Investment (HAMAG BICRO). The project BOND aimed to improve the competitiveness of Croatian SMEs by developing effective BSIs that would create a stimulating entrepreneurial ecosystem and ensure SME sustainability.

Interviews with owners/managers in our sample will provide a better understanding of the needs of SMEs and help identify the gap in BSI services. Interviews with managers in BSIs will provide a different perspective on the same problem and contribute to a better understanding of their capacities. Comparison of their perceptions will enable the creation of recommendations for better services, stronger BSIs and more competitive SMEs in Croatia.

4. METHODOLOGY

This article aims to critically review the work of BSI in Croatia as part of the entrepreneurial ecosystem that aims to promote entrepreneurship and the creation of new businesses. Since various reports that evaluate and compare ecosystems provide paradoxical results - every year, there are more BSIs in the Croatian ecosystem, but Croatia's ranking in terms of competitiveness gets worse every year - the first task was to highlight the most critical results from secondary sources. For this purpose, the most important reports and rankings were used - the NECI ranking, the GEM report and the SME report analyzing the Croatian ecosystem from 2011.

The second part of the research aimed to collect the opinions and experiences of owners/managers of SMEs in Croatia. Previous research findings indicated a correlation between the size and age of SMEs and the owner's experience and the likelihood of using BSI services. Therefore, five owners/managers of SMEs were selected for this research, varying by size and age of the business, by industry, and geographically (from different parts of Croatia). This preliminary research will provide knowledge and evidence gaps for future research directions.

The third part of the research focused on the managers of BSI and their opinions on the interview results with the owners/managers of SMEs.

Finally, the websites of all 55 business centers that were supposed to provide technical assistance to SMEs were reviewed and compared in the matrix. The comparison of their services revealed the gaps in service offerings in the market. Of the 534 entities registered in the Unique Register of Entrepreneurial Infra-

structure, only 55 were registered as business centers. They were all analyzed, although 2 of the facilities were represented differently on their websites.

Figure 2. Research design

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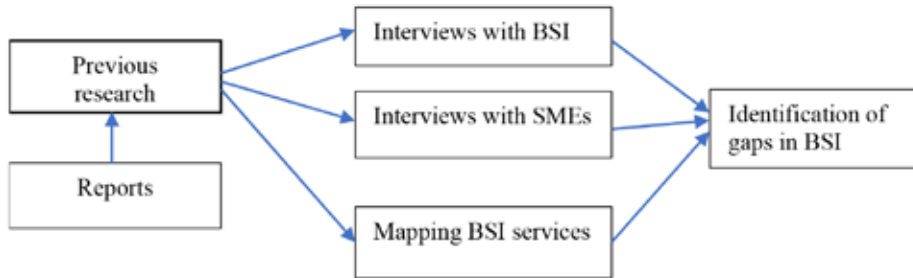
Source: Authors

In order to obtain a detailed picture that includes some explanations of people's behavior and beliefs in different contexts, the interview was the most appropriate method (Alshenqeeti, 2014). According to Kvale (1996), the interview is a conversation to collect respondents' descriptions and interpretations of phenomena. One of the characteristics of the interview as a research method is that it enables the connection between people's actions and their beliefs. Reports and previous research provided results about the current situation, but the causes and conditions that led to the final results were missing. Qualitative research will contribute to a better understanding of the evolution of the entrepreneurial ecosystem but will also provide insights into the politics and relationships between different actors and stakeholders.

5. RESULTS

The analysis of the main reports and strategic documents on the development of the entrepreneurial ecosystem in Croatia revealed exciting findings and conclusions. The number of players in the Croatian entrepreneurial ecosystem is increasing year by year, especially when entrepreneurial zones are taken into account. The number of BSIs (development agencies, incubators, accelerators, business or entrepreneurial centers, etc.) is also growing, but to a lesser extent. Financial support for creating new zones and BSIs is one of the reasons for the growing number of institutions.

Most BSIs are established by local authorities (at the county or city level). Therefore, according to the survey results, BSI managers' scope of work is not only focused on providing technical support (services) to SMEs and other entities. One of the managers in the sample, in addition to managing the BSI (established by the city), also has to manage a cinema (owned by the city) and a seaside resort (also owned by the city). The team of this BSI spends most of its time managing all three facilities, leaving less time for developing new or more appropriate services for SME owners/managers. Unfortunately, the analysis of their work results cannot consider the management of the cinema and the resort. The other manager in the sample is engaged in managing the business center and the business incubator. Although there are some similarities in the scope of their work, managing both institutions requires more time. It leaves less time for improvement and reflection on the quality of services both institutions offer.

BSI ownership is also a significant obstacle to SMEs' creation of better or more appropriate or desired services. BSI management changes depending on which party wins the local elections. The new leadership usually does not adhere to the promises or visions of the old leadership. One of the managers in the sample emphasized that although the city established BSI and provided incentives for its work, it left it without any financial support two years ago. The institution had to change its mindset and focus on new funding sources (mainly EU funds), which required new knowledge and an uncertain future. As a result, the team was left with only four employees responsible for 50 tenants in the incubator, co-working space, and already approved EU projects.

Given the management challenges in the BSIs studied, the results of the survey of entrepreneurs were not surprising.

Table 5. Most essential opinions of the owners/managers in SMEs on services provided by BSIs

No.	Size and industry	Years of experience	Opinion on available BSI services
1.	Micro company, hospitality and tourism	24	Not sure what the term BSI means Never asked for BSI services since has an accountant and experience in the industry. Not familiar with the training opportunities offered by BSIs Communication between BSIs and SMEs is not adequate (do not have time to search their web pages) When advice is needed, ask other entrepreneurs Technical assistance will instead ask in private consulting enterprises
2.	Small company, recreation	16	Education and training were necessary for the development of the enterprise (in Croatia and abroad) Not familiar with the services offered by BSI Interested in training, but not sure how to get information about them Show interest in education/training services by BSIs Technical assistance for EU projects finds in private consulting enterprises
3.	The micro company, trade	3	Enterprise started out of necessity (could not find a job after high school) Not familiar with the services offered by BSI Emphasizes the importance of external expertise (accountant provides all the necessary advice and help) BSI (on the local level) was in charge of financial aid - not transparent and bad experience (lack of trust in institutions) Not interested in training activities
4.	Small company, environmental rehabilitation	9	Familiar with the term of BSIs, but not with the scope of their work (especially not services that they offer) A really specific niche of expertise is needed for that business - not sure how BSI can help Emphasizes the importance of external expertise (accountant provides all the necessary advice and help) Lack of trust in institutions
5.	The micro company, health services	5	More than 20 years of experience in that industry (worked for another employer) Not familiar with the services of BSIs The accountant provides all the necessary advice and help (including tax and financial advice) Does not have growth plans, but if decides, he will ask for the help of BSIs.

Source: Authors' data

The results of the interviews with the owner/managers of SMEs follow the findings of the reports and previous research analyzed in this paper. The owners/managers of SMEs are not familiar with the services offered by BSI in their environment. The lack of institutional trust is evident in many previous researches. The owners/managers in the sample usually seek advice from their accountants, even if it is not within their scope of work or expertise (tax

or financial advice). The size of the business and the owner/manager's experience in the market and the industry are unrelated to the likelihood of using BSI services. Owners/managers with more experience tend to place more value on expertise and advice. The results also show that BSIs do not adequately advertise their activities. The results showed that most owners/managers surveyed were not familiar with BSI's scope of work and activities.

Although the owners/managers did not have time to browse the BSI websites for activities that might benefit them, the technical assistance provided by all (entrepreneurial) centers was recorded.

Table 6. Matrix of technical assistance provided by BSI in Croatia

Type of the support	Training	counseling/ consulting	Preparation of EU projects	Financial information and advice	Business planning	Accounting services
BSI (Business center)						
Moneo d.o.o.		+	+	+		+
Coral Consulting Service d.o.o.		+		+		
DIH Agrihrana Hrvatska	+					
FORES d.o.o.	+					
Razvojni centar d.o.o.						
Centar za razvoj i edukaciju Poličnik	+	+				
Numera j.d.o.o.						
Poduzetnička zona Korana d.o.o.						
Poslovni plan d.o.o.	+	+		+	+	+
VIVA-M j.d.o.o.			+			
PC Smarter		+		+	+	
START Bjelovar		+	+			
Roterm d.o.o.						
HKKKKI						
Urbanex d.o.o.			+			
Bomis d.o.o.	+		+	+		
Poduzetnički centar Scala d.o.o.		+		+	+	+
Poduzetnički centar Sinj						
Poduzetnički centar Zovnica	+					
Poduzetnički centar TIP						
Synergia savjetovanje d.o.o.	+	+	+	+	+	+
Poduzetnički centar Blue-Green Hub						
IPEMED		+	+		+	
Poduzetnički centar Đakovo d.o.o.	+	+	+	+		
Rijeka 2020 d.o.o.						
Poduzetnički centar Sigma j.d.o.o.	+	+		+		
Centar za poduzetništvo	+	+	+	+	+	

DUGA			+			
PC Aktiva	+			+	+	
Poduzetnički centar Vrgorac d.o.o.			+			
Centar za inovacije i poduzetništvo d. o. o.	+	+	+			
CEPOR	+	+				
CEDRA SPLIT d.o.o.	+		+		+	
CLIP Našice	+	+	+			
Poduzetnički centar Vizija j.d.o.o.						
KPC d.o.o.	+	+	+			
Poduzetnički centar Doxtus d.o.o.	+	+	+	+	+	
Lucera d.o.o.	+	+				
Klaster Znam!	+	+				
PCS	+	+		+	+	
Poduzetnički centar Ljubešćica d.o.o.						
Poduzetnički centar Pleternica d.o.o.	+	+			+	
Valpovački poduzetnički centar d.o.o		+				
Plavi ured Poduzetnički centar Grada Zagreba	+	+		+		
Poslovna zona Ivanec d.o.o.						
Tehnološko-inovacijski centar Međimurje d.o.o.						
Poduzetnički centar Beli Manastir d.o.o. Beli Manastir		+				
Poduzetnički centar Samobor d.o.o.		+		+		
Poduzetnički centar Vinodol d.o.o.	+	+	+		+	
Centar za poduzetništvo d.o.o.	+	+		+	+	
PC KZŽ	+	+	+			
Poslovni biro PBIRO d.o.o.	+	+	+	+	+	
VG Poduzetnički centar d.o.o.						
Poduzetnički centar d.o.o.	+	+		+		
Zadruga Poduzetnička mreža	+	+		+	+	+

Source: Authors' data

The matrix shows that many BSIs do not have up-to-date website information. Some of the BSIs do not even have a website; the only page available is the one with contact information.

Mapping of BSI technical support (services) revealed that only 58% of BSIs provide consulting or advisory services in addition to training. This may indicate that BSI services are entirely profit-driven, neglecting that most SME owners/managers are usually looking for information.

Information on available and EU projects for which SMEs can apply is offered by almost 35%. In contrast, business planning, which could help SMEs prepare for future activities and growth, is offered by 27.2%. Only 9% of BSIs also offer accounting services or advice.

6. CONCLUSION

According to the results of the analyzed reports in this paper, the entrepreneurial ecosystem in Croatia is not stimulating but not limiting for entrepreneurial development, especially in the SME sector. According to the measurements defined in previous research, the Croatian entrepreneurial ecosystem is satisfactory only in diversity. Density, fluidity, and connectivity still need to be worked on. The number and diversity of different actors in the ecosystem do not guarantee quality services that meet the needs of the SME sector in Croatia. Quality can be achieved by promoting services SMEs need and demand, not by providing grants to create new BSIs. BSIs should focus more on the needs of SMEs and the creation of technical support (services) that will help them overcome the obstacles and limitations that hinder their further development and competitiveness in the EU and international market. Therefore, BSIs should be freed from other activities that are not closely related to the development of the entrepreneurial ecosystem.

The network of 534 different BSIs represents an excellent opportunity for the development of an entrepreneurial ecosystem that will stimulate the creation of new startups that will create new jobs (ecosystem density), reduce labor turnover and immigration (ecosystem flexibility), and stimulate the growth of SMEs and their export activities (ecosystem connectivity).

BSIs must do more to promote their services, provide up-to-date information, and organize networking events for SMEs. Networking should also be increased among BSIs, as their specialization can fill the gaps identified in the matrix. These services will enable the creation of services that meet the needs of SMEs and position them as essential partners of SMEs.

The main limitation of this study is that it only analyzes the services offered by the Business (Entrepreneurial) Centers. Future studies should provide a more detailed analysis of all actors and stakeholders in the entrepreneurial ecosystem. In addition, future studies should be quantitative and try to find

a correlation between the development of regions/countries and the work of BSIs. Notwithstanding its limitations, this study provides valuable insights into the main gaps in the entrepreneurial ecosystem in Croatia.

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PERCEIVED USEFULNESS OF CONTINUING EDUCATION TO MANAGEMENT PRACTICE

Gordana DUKIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Humanities and Social Sciences,

E-mail: gdukic@ffos.hr

Zvonimir JURKOVIĆ, Ph.D.
Economic and Trade School Ivan Domac Vinkovci

E-mail: zvonimir.jurkovic1@gmail.com

Abstract

Continuing education has become essential in a rapidly changing and complex business environment. Now, more than ever, managers are expected to constantly update and improve their knowledge and skills to deal with all the challenges successfully. Nonetheless, it is still not entirely clear how managers perceive the value of continuing education and what socio-demographic characteristics influence their attitudes. Accordingly, this study aimed to explore the perceived usefulness of continuing education to management practice as well as the similarities and differences in this regard between certain groups of managers. The research was conducted on a sample of 212 Croatian managers from various organizations and levels of hierarchy. Generally, they agreed that continuing education contributes to developing managers' competencies and improves their performance. K-means cluster analysis was performed to classify participants into two homogeneous groups based on their responses to the questionnaire items. The first cluster consisted of those inclined to agree that continuing education is helpful in management practice. The second cluster included managers less likely to perceive continuing education as valuable and essential. The chi-square test showed that some socio-demographic characteristics were significantly associated with attitudes toward the usefulness of continuing education. Overall, the present study's findings expand the limited

body of literature on the subject and enhance the understanding regarding the professional development of managers.

Keywords: *Croatian managers, continuing education, usefulness to management practice, cluster analysis, the influence of socio-demographic characteristics*

JEL Classification: *A29, C38, M53*

1. INTRODUCTION

In a rapidly changing and complex business environment, employees, especially managers, must constantly update and improve their competencies to successfully deal with all the challenges. For this reason, they need a mechanism to obtain and disseminate a range of their professional skills after formal education. Participation in continuing education is essential in bridging gaps in the knowledge base needed for a particular job (Barnes, 2001). Continuing education as both formal and informal learning helps people build and maintain their work ability (Thieme et al., 2015).

In a broad sense, continuing education includes all learning activities that people undertake for different reasons after leaving the formal education system (Dhall & Singh, 2015). It is seen as a complex process consisting of successive stages of learning through which professional skills and creative potential are improved, and social inclusion is enhanced (De Greef et al., 2012; Gorodova et al., 2021). Today, it is widely recognized that continuing education plays a vital role in society. Laal et al. (2014) state that continuing education benefits individuals, communities, and the national economy. Further education and training provide individuals with the required knowledge, skills, values, and attitudes. Those involved in continuing education strengthen their capabilities, leading to a more productive and innovative workforce and community. Finally, this results in a more robust economy and a better society. Continuing education is also perceived as a critical factor influencing salary levels and job attitudes (Alkhimenko et al., 2014).

Although the idea of lifelong learning has existed for a long time, adult and continuing education development began due to profound social, economic, and technological changes during the nineteenth century (Sultanova, 2022). Since the second half of the twentieth century, adult and continuing education has experienced a significant expansion (Egetenmeyer et al., 2019). This has led to numerous definitions of continuing education. Some are more general and

inclusive, while others are more specific and related to a particular aspect. Jarvis (2005) defined continuing education as "those learning opportunities which are taken up after the end of initial full-time education." Continuing education is also described as acquiring, deepening, and improving general knowledge, professional competencies, and civic and moral maturity (Kucherenko, 2016). In a work-related context, continuing education can be defined as ongoing activities that improve the work performance of individuals involved in learning (Tan et al., 2007). De Boer et al. (2013) viewed continuing education as a part of lifelong learning that begins when a person enters the labor force. In this sense, they defined continuing higher education as any organized learning activity at the tertiary level undertaken to obtain and improve knowledge, skills, and competencies of adults who are employed or have work experience.

An overview of the literature indicates no consensus among scholars and practitioners on what constitutes continuing education. Thus, Pastuović (2008) stated that although continuing education mainly refers to the professional, informal education of adults after their primary schooling, some approaches include ongoing non-professional education and even formal education after primary school. Downey et al. (2006) defined continuing education broadly as "the range of programs and services that provide workforce training, adult basic education, academic transfer curricula, personal enrichment, and community outreach courses." For her study, Rice (2001) viewed continuing education as "any planned, systematic learning experience or activity that occurs after basic nursing preparation," while Alansari and Al-Shehab (2006) described it as "an education that comprises conferences, seminars, and refresher courses that occur while a person is in paid employment." According to McDonnell and Crehan (2012), continuing education refers to any form of education after qualification designed to keep professionals up to date in their practice. It can be concluded that in a knowledge and information-based society, continuing education is necessary for success and survival.

2. CONTINUING EDUCATION OF MANAGERS

Continuing education is imperative for managers to keep abreast of current trends and practices. Such education gives managers the knowledge and skills to perform managerial tasks and satisfy the organization's needs. In order to achieve this goal, they must be willing to learn and take responsibility for their

development. Managers involved in lifelong learning and training are more likely to be capable of addressing and solving problems autonomously, effectively, and competently (Jankurová, 2014). Although continuing education is required for managers at all levels, strategic managers seem to find it most valuable (Okonkwo et al., 2020). In addition, it should be remembered that managers do not equally value the importance of each continuing education function. A study by Walston and Khaliq (2010) suggested that hospital chief executive officers believe that continuing education is most valuable to gain the knowledge needed to keep up with the rapidly changing environment and less for career advancement and succession planning. Walston et al. (2010) found that organizational and individual factors influence the amount of time hospital executives spend on continuing education. Most reported that continuing education is critical to understanding healthcare delivery's political and structural changes. According to Bolek et al. (2018), there is an awareness that the continuing education of managers in various fields is essential. Managers must possess the knowledge and skills to manage organizations and also be able to detect threats, opportunities, and risks in a competitive environment. Viable continuing education programs are essential for small business owners. The effort and resources they spend in maintaining their competencies will pay off by preventing potential losses that could occur in the future (Atamian & VanZante, 2010).

There are various reasons for engaging in continuing education activities. Billet et al. (2014) found that managers emphasized organization-related factors and the effectiveness of training programs in meeting enterprise goals as driving their preference for and approaches to continuing education. Mahmood and Omran (2011) identified other factors that influence managers' participation in further education, such as personal characteristics, shortage of resources, and credibility of training providers. Managers' engagement in continuing education can also be affected by its poor integration into organizational culture (Eftimie, 2013). In addition, it seems that attitudes toward continuing education are related to the socio-demographic characteristics of managers. A study by Ericksen (2018) reported that female small business managers hold more favorable attitudes toward continuing education than their male counterparts. It was also determined that managers who had participated in continuing education perceived these activities more favorably than non-participants.

Based on his earlier research, Coghlan (2004) distinguished four activities in the learning process of managers: experiencing, reflecting, interpreting, and

taking action. These four activities operate as a continuous cycle, thus making learning a lifelong endeavor. According to the author, managers need to develop skills in each activity. This means they should be able to experience directly, stand back and ask questions, conceptualize answers to these questions, and take risks in similar or new situations. Managers can increase their knowledge base and skills through continuing education programs. Dubruc and Badour (2011) noted that establishing continuing education programs for managers depends on five factors: legal obligations, understanding of learners' needs, support from a national network, learners' interest in meeting together, and the ability of providers to adapt existing programs to the specific needs of each group. Various entities provide continuing education, including universities, colleges, professional associations, and companies. Gregg and Stewart (2013) stated that in addition to MBAs and executive education, many business schools also offer certified continuing education for managers. According to them, these programs tend to be more sensitive to the needs of lower and mid-level professionals. Relationships with local businesses are also built through continuing education programs. Smith and Mikelonis (2008) were of a similar opinion. They stressed that continuing education is not only beneficial for managers but also for faculty engaged in such activities. Faculty must consult and collaborate with business professionals, students, and other stakeholders to design and deliver the required training. The challenges of assisting businesses are invigorating and induce the use of interdisciplinary sources in finding solutions to business problems. As faculty gain experience, they more effectively transfer skills to learners and find a new clientele for their programs.

3. AIMS, RESEARCH QUESTIONS, AND HYPOTHESES

Continuing education is vital for all professionals, especially in practice-based disciplines (Black, 2017). Since managers are responsible directly for the company's performance and, as such, are accountable to the team members with whom they work and to the employees who report to them (Hendry, 2006), they must possess up-to-date knowledge and skills. Therefore, managers must educate themselves and provide training to their staff, which is particularly challenging in times of change (Meacham, 1994). In today's rapidly evolving business environment, managers and employees should be encouraged to think and

act in new ways to develop abilities of integrated autonomy, increased interaction, and learning (Wilhelmson et al., 2015). Even though continuing education is widely considered necessary, it is still unclear how managers perceive its value and what socio-demographic characteristics influence their attitudes. With this in mind, the present study explored the perceived usefulness of continuing education to management practice. The research also sought to identify the similarities and differences in this regard between certain groups of managers. As such, this paper extends the work of Jurković (2020). Specifically, the following research questions were addressed in the study:

RQ1: How do Croatian managers perceive the usefulness of continuing education to management practice?

RQ2: Do Croatian managers tend to cluster into different groups based on their attitudes toward the usefulness of continuing education?

RQ3: Is cluster membership related to the socio-demographic characteristics of Croatian managers and the characteristics of their companies?

Three hypotheses were developed from the research questions:

H1: Croatian managers generally perceive continuing education as valuable.

H2: Croatian managers inclined to agree that continuing education is helpful to management practice would cluster together, and those who perceived continuing education as not applicable would cluster together.

H3: There are some socio-demographic characteristics associated with cluster membership.

4. METHODOLOGY

This study is part of the broader research examining the continuing education of managers. An online questionnaire was used to collect data from the target group. The study population was persons with leadership roles in Croatian companies responsible for planning, organizing, staffing, leading, and controlling. Potential participants received e-mail invitations containing background information and a survey link. Several reminder e-mails were sent until the survey closed. Despite efforts to increase the number of respondents, only 212 managers completed the questionnaire, yielding a response rate slightly above 10%. Participants' characteristics are summarised in Table 1.

Table 1. Participants' characteristics

Characteristic		No. (%)
Gender	Male	97 (45.8)
	Female	115 (54.2)
Age	22 to 35 years	42 (19.8)
	36 to 50 years	113 (53.3)
	51 to 75 years	57 (26.9)
Highest level of education	Secondary school	29 (13.7)
	Undergraduate or graduate degree	135 (63.7)
	Postgraduate degree	48 (22.6)
Education abroad experience	Yes	40 (18.9)
	No	172 (81.1)
Management experience	0 to 5 years	58 (27.4)
	6 to 15 years	98 (46.2)
	16 to 45 years	56 (26.4)
Management level	Lower level	26 (12.3)
	Middle level	44 (20.8)
	Upper level	142 (67.0)

Most participants were female and aged 36 to 50 years. Most respondents had an undergraduate or graduate degree and did not study abroad. As shown in Table 1, slightly less than half of the participants had 6 to 15 years of experience in managerial positions. More than two-thirds of those surveyed indicated that they were upper-level managers. The characteristics of the respondents' companies are presented in Table 2.

Table 2. Characteristics of respondents' companies

Characteristic		No. (%)
Ownership	Private-owned enterprises	171 (80.7)
	Mixed-owned enterprises	10 (4.7)
	State-owned enterprises	31 (14.6)
Size	Micro entrepreneurs	83 (39.2)
	Small entrepreneurs	75 (35.4)
	Medium and large entrepreneurs	54 (25.5)
Main market orientation	Domestic market	162 (76.4)
	Both domestic and foreign markets	19 (9.0)
	Foreign market	31 (14.6)

The vast majority of managers were from private-owned enterprises. The most significant number of respondents managed firms that were classified as micro-entrepreneurs. The enterprises were divided into micro, small, medium, and large, depending on the average number of employees, annual income, and

total assets. According to the participants, most companies were oriented toward the domestic market.

In addition to descriptive statistics, k-means cluster analysis, as well as a one-sample sign test, a chi-square test of independence, and pairwise comparisons of column proportions, were used in the study. The level of statistical significance was set at $p < 0.05$.

5. FINDINGS

Respondents were asked to express their agreement or disagreement with six statements regarding the usefulness of continuing education to management practice. They indicated their responses on a Likert scale ranging from 1 to 5 (1=strongly disagree, 2=somewhat disagree, 3=neutral, 4=somewhat agree, 5=strongly agree). Table 3 shows the descriptive statistics for each item (mean, median, standard deviation, and interquartile range), as well as the results of one-sample sign tests, which were used to test the null hypothesis that the median population response is equal to 3 against the alternative hypothesis that it is greater than 3. The nonparametric one-sample sign test was applied as the data were ordinal and did not meet the assumptions of normality and symmetry.

Table 3. Descriptive statistics of responses to survey items and results of one-sample sign tests

Item	Mean	Median	Standard deviation	Interquartile range	One-sample sign test (p-value)
Managers who participate in continuing education are more competent than those who do not	3.96	4.00	0.99	2.00	0.000*
Managers who participate in continuing education are better at planning and goal setting	3.92	4.00	0.98	2.00	0.000*
Managers who participate in continuing education are better at organizing	3.71	4.00	1.05	1.50	0.000*
Managers who participate in continuing education make better business decisions	3.83	4.00	0.98	1.50	0.000*
Managers who participate in continuing education are better at leading and motivating employees	3.88	4.00	1.01	2.00	0.000*
Managers who participate in continuing education contribute more to the company's growth	3.88	4.00	0.98	2.00	0.000*

* Statistically significant at $p < 0.05$

The mean values ranged from 3.71 to 3.96, indicating participants' general agreement with the statements about the usefulness of continuing education to management practice. According to the means, respondents mostly agreed that managers who participate in continuing education are more competent than those who do not. On the other hand, they least agreed that managers who participate in continuing education are better at organizing. All medians were 4, corresponding to "somewhat agree" on the five-point Likert scale. The standard deviations were around 1, while the interquartile ranges were 1.5 and 2. These results suggested that there was a relatively large dispersion in the data. One-sample sign tests showed that all median responses were above the scale's mid-point, which was expected. Therefore, it can be concluded that Croatian managers generally perceived continuing education as valuable, as proposed in the first hypothesis.

The k-means clustering algorithm was used to identify two relatively homogeneous groups of managers based on their responses to the questionnaire items. The means and standard deviations of the clusters are provided in Table 4.

Table 4. Cluster means and standard deviations for each of the variables

Item	Cluster 1		Cluster 2	
	Mean	Standard deviation	Mean	Standard deviation
Managers who participate in continuing education are more competent than those who do not	4.37	0.66	2.95	0.95
Managers who participate in continuing education are better at planning and goal setting	4.35	0.61	2.85	0.90
Managers who participate in continuing education are better at organizing	4.17	0.73	2.61	0.88
Managers who participate in continuing education make better business decisions	4.27	0.60	2.74	0.89
Managers who participate in continuing education are better at leading and motivating employees	4.35	0.63	2.74	0.85
Managers who participate in continuing education contribute more to the company's growth	4.33	0.55	2.79	0.94

Cluster analysis grouped the surveyed managers based on the similarity of their attitudes. The first cluster contained 150 participants who agreed that continuing education is helpful in management practice. The means of the first cluster ranged from 4.17 to 4.37. The second cluster consisted of 62 respondents who did not tend to perceive continuing education as valuable and essen-

tial. The second cluster's means ranged from 2.61 to 2.95. This means that the second hypothesis can be accepted. According to the standard deviations, the first cluster had less variability in item responses than the second cluster.

The chi-square test of independence was used to answer the third research question and test the third hypothesis. First, whether cluster membership was associated with managers' personal characteristics was tested. Table 5 displays the counts and row percentages of each characteristic by cluster group and the results of the chi-square analysis.

Table 5. Managers' characteristics by cluster group (counts and row percentages) and results of chi-square tests

Characteristic	Cluster 1	Cluster 2	Chi-square test	
	No. (%)	No. (%)	χ^2	p
Gender				
Male	69 (71.1)	28 (28.9)	0.012	0.911
Female	81 (70.4)	34 (29.6)		
Age				
22 to 35 years	21 (50.0)	21 (50.0)	10.911	0.004*
36 to 50 years	86 (76.1)	27 (23.9)		
51 to 75 years	43 (75.4)	14 (24.6)		
Highest level of education				
Secondary school	19 (65.5)	10 (34.5)	2.253	0.324
Undergraduate or graduate degree	93 (68.9)	42 (31.1)		
Postgraduate degree	38 (79.2)	10 (20.8)		
Education abroad experience				
Yes	36 (90.0)	4 (10.0)	8.825	0.003*
No	114 (66.3)	58 (33.7)		
Management experience				
0 to 5 years	32 (55.2)	26 (44.8)	9.370	0.009*
6 to 15 years	75 (76.5)	23 (23.5)		
16 to 45 years	43 (76.8)	13 (23.2)		
Management level				
Lower level	14 (53.8)	12 (46.2)	4.575	0.102
Middle level	34 (77.3)	10 (22.7)		
Upper level	102 (71.8)	40 (28.2)		

* Statistically significant at $p < 0.05$

The results of the chi-square analysis indicated a statistically significant relationship between age and cluster membership. Pairwise comparisons of column proportions using a Bonferroni correction showed that middle-aged and

older managers were more likely than their younger counterparts to agree that continuing education is helpful in management practice. Furthermore, the chi-square test revealed that the proportion of managers who perceived continuing education as valuable and important was significantly greater in the group with education abroad experience than in the group without such experience. The chi-square test also confirmed the association between management experience and cluster membership. Post-hoc pairwise comparisons found that managers with up to five years of experience in managerial positions less commonly agreed that continuing education is helpful to management practice compared to their more experienced colleagues.

In order to answer the third research question and test the corresponding hypothesis, it was also checked whether cluster membership was associated with characteristics of managers' companies. The counts and row percentages of each characteristic by cluster group and the results of the chi-square analysis are given in Table 6.

Table 6. Characteristics of managers' companies by cluster group (counts and row percentages) and results of chi-square tests

| Characteristic | Cluster 1 | Cluster 2 | Chi-square test | |
	No. (%)	No. (%)	χ^2	p
Ownership				
Private-owned enterprises	125 (73.1)	46 (26.9)	4.662	0.097
Mixed-owned enterprises	8 (80.0)	2 (20.0)		
State-owned enterprises	17 (54.8)	14 (45.2)		
Size				
Micro entrepreneurs	54 (65.1)	29 (34.9)	2.240	0.326
Small entrepreneurs	55 (73.3)	20 (26.7)		
Medium and large entrepreneurs	41 (75.9)	13 (24.1)		
Main market orientation				
Domestic market	108 (66.7)	54 (33.3)	5.548	0.062
Both domestic and foreign markets	16 (84.2)	3 (15.8)		
Foreign market	26 (83.9)	5 (16.1)		

The chi-square test did not provide evidence of a statistically significant relationship between any characteristics of the companies and cluster membership. Thus, cluster membership was not associated significantly with the type of ownership of the organization, its size, or the market it operates in. Therefore, the third hypothesis can also be accepted.

6. CONCLUSION

Continuing education is essential for all managers to carry out their duties successfully. Today's business environment changes rapidly, and managers must acquire new knowledge and skills to meet the challenges and opportunities ahead. Their personal development and organizational growth should be aligned and viewed as coherent. Companies of all types and sizes need qualified and trained managers. As the demand for competent leaders increased, more and more firms started to recognize the importance of management development activities. At the same time, many institutions began to offer education programs aimed at managers. Over time, the awareness of the necessity of continuing education for managers has grown considerably. As a result, business organizations are now paying more attention and devoting more resources than ever before to the professional development of their managers. Although it seems evident that continuing education contributes to increased competence and improved performance in the workplace, its benefits from the managers' perspective are still relatively unexplored. The purpose of the present study was to shed light on this issue by surveying managers from Croatian companies.

The research found that Croatian managers generally believe that continuing education helps them to carry out their jobs more efficiently and effectively. It should be mentioned that they did not fully agree that continuing education is helpful in management practice, as some disagreed with this view. The study also revealed that Croatian managers could be clustered into two groups based on their attitudes toward the usefulness of continuing education. The first cluster was more extensive and optimistic about continuing education's importance than the second cluster. In addition, the chi-square analysis indicated a statistically significant relationship between age, education abroad, management experience, and cluster membership, suggesting some socio-demographic characteristics associated with attitudes toward the usefulness of continuing education. Although the results of the present study are exciting and meaningful to academic researchers, business leaders, and educators, they should be interpreted within the context of its limitations, including a relatively small number of respondents, the inability to determine the representativeness of the sample and the possibility of social desirability bias.

Nevertheless, in light of the diversity of the participants' backgrounds, it is believed that the findings can be generalized to the population of Croatian

managers, thus contributing to the understanding of their professional development. Further research is needed to gain more insights into continuing education of Croatian managers. Future studies should include a more significant number of participants. In addition, a more detailed questionnaire could be used to gather comprehensive data and strengthen the findings. It is also necessary to assess the validity and reliability of the research instrument. Finally, conducting interviews would provide valuable information on the topics discussed throughout the paper.

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HAS THE PERFORMANCE OF GENERAL HOSPITALS IN CROATIA IMPROVED OVER TIME? 1997-2021

Danijela RABAR, Ph.D.
Juraj Dobrila University of Pula

E-mail: drabar@unipu.hr

Abstract

The hospital sector is one of the most critical components of the healthcare system. The hospital care industry can be affected by many internal and external factors. From the hospital management point of view, this points to an ongoing need for measuring and analyzing the comparative efficiency of hospitals, emphasizing indicators that can influence and improve. Since they are the most accessible to the population, general hospitals are vital in providing hospital services in Croatia. This paper aims to improve on earlier research on hospital efficiency by covering not just one year but a quarter of a century and using extended models for efficiency measurement. The empirical research on the efficiency of hospitals based on performance indicators questions three hypotheses. The first one results from comparing the performance of each hospital in each year with its own performance in other years and predicts a continuous growth of comparative efficiency from year to year for most hospitals. The second hypothesis is based on the mutual comparison and consequent ranking of all hospitals within each year. It assumes that most hospitals are ranked very differently from year to year. The results gained based on four hospital performance indicators for 1997-2021, using window data envelopment analysis with bounded output, reject the first and confirm the second hypothesis. The third hypothesis is accepted, which considers that the number of discharged patients has the greatest impact on efficiency. All the above results empirically assess the situation and can assist health policymakers in making a good turn in improving the health sector.

Keywords: general hospitals, (in)efficiency, performance indicators, data envelopment analysis, bounded output

JEL Classification: C33, C44, I12

1. INTRODUCTION

Croatia spends less per capita on health care than most other EU countries. In 2019, healthcare consumption was one of the three lowest in the EU at 7.0% of GDP, below the EU average of 9.9% (OECD/European Observatory on Health Systems and Policies, 2021). This data is even more alarming when one considers the country's relatively low GDP per capita. On the other side, Croatia is among the leading countries in the EU in terms of health care availability where, on the one hand, a large part of the population is covered by mandatory health insurance and has the right to health care and, on the other side, only a third of insured persons are actively insured people, upon whose work contributions for health insurance are paid. Therefore, it is essential to understand the healthcare industry's current situation and improve overall efficiency. What plays a crucial role in achieving the above is performance analysis.

The hospital sector deserves study and discussion because of its significant role in providing health services and its outstanding share in the expenditures of the health system in Croatia. Moreover, in Croatia in 2019, the share of public spending in the total spending on hospital care was 89% (OECD/European Observatory on Health Systems and Policies, 2021). This is one of the many reasons public hospital administration should actively monitor and improve performance indicators and resulting efficiency.

Unlike specialty hospitals which target one area of medicine and care or a particular group of patients, clinical hospital centers and general hospitals provide for the diagnosis and treatment of inpatients and clients with a wide range of diseases or injuries, which is why they should be available to as many residents as possible. As there are only four medical schools in Croatia, four of the 21 counties have clinical hospital centers, while seventeen counties have general hospitals[1]. This is also the reason why the subject of this paper is the performance efficiency of general hospitals.

The health care system of Croatia is the subject of numerous analyses, which are mainly carried out based on statistical data recorded by state institutions such as the Croatian Bureau of Statistics, Croatian Health Insurance Fund (CHIF), and Croatian Institute of Public Health, or international institutions such as Eurostat, OECD/European Observatory on Health Systems and Poli-

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[1] Zagreb County is the only one without clinical or general hospital, but it surrounds the City of Zagreb, whose health facilities are therefore equally accessible to the population of that county.

cies, World Bank and World Health Organization. An example is the report of the Agency for Quality and Accreditation in Health and Social Care (2018), which ranks Croatian hospitals according to their performance.

There are also scientific papers dealing with the issues of the Croatian health system. Although these papers cover different aspects of this topic and employ various methods and models, their evidence-based approach is of unsurpassed importance. Below is a brief overview of recent relevant research.

Based on data collected through an audit conducted in 28 acute hospitals in Croatia over one year, Mesarić (2019) identifies deficiencies in implementing clinical guidelines in practice and medical documentation.

The primary focus of Radin (2019) is on reforms in the financing and organization of health care in Croatia in the 25-year period that preceded the study. The author concludes that the healthcare policy has been a compilation of ad hoc reforms that have secured financing by centralizing it into a social insurance fund. However, it has not improved the system's administration, organization or personnel management. Health indicators and data on patient satisfaction point to weaknesses in the performance of the healthcare system, as well as to an overall lack of understanding of the scope of the health system problems by critical actors.

As Šimović et al. (2021) pointed out, the COVID-19 crisis has deepened and exacerbated the existing problems of financing the health system in Croatia. In the period 1994-2021, a total of more than three billion euros was spent on bailing out the health service. Therefore, the demands for restructuring the healthcare system on the inside in terms of organization and management to achieve much better results with the resources received are legitimate. The authors see the solution to this problem as implementing specific reforms on the health system's revenue and expenditure side.

The impact of Croatian reforms related to the funding of inpatient care on the efficiency of 33 acute hospitals in Croatia is assessed by Kalanj et al. (2021). Observing hospital activity and diagnosis-related grouping, the average length of stay, hospital staffing, CHIF revenue streams, and hospital incomes and expenditures between 2009 and 2018, the authors conclude that Croatian reforms failed to improve hospital efficiency.

Kalanj et al. (2022) present the activities of the hospital network in Croatia between 2017 and 2021 concerning the hospital payment methods and de-

mands for hospital services based on the type of referral. The authors conclude that improvement is necessary for analyzing hospital efficiency in service provision, quality of health care, and financial aspects of sustainability, which is also a prerequisite for implementing the reform of the hospital system.

Several studies on measuring the efficiency of individual healthcare sectors in Croatia use the Data Envelopment Analysis (DEA) method. These papers include institutes of public health, hospitals, and nursing homes and are briefly described below.

Vitezić et al. (2016, 2019), Vitezić and Petrlić (2020), and Rabar et al. (2020) measure the efficiency of different services offered by institutes of public health in Croatia, using various models and indicators and covering different periods between 2014 and 2018. The earliest among these studies employs DEA under the assumption of variable returns to scale, with the primary intention of investigating and analyzing the suitability of DEA for the intended purpose. The following two studies combine DEA with Balance Scorecard, a measuring tool generally used for profit-oriented organizations, which they adapt for public health institutes and their departments. The last of these studies use DEA under both constant and variable returns to scale in order to single out three different types of efficiency – technical, pure technical, and scale efficiency within the departments of a public health institute. The general conclusion is that the significant differences in business performance between departments necessitate an investigation of the financial perspective to consider the possible causes of relative inefficiency.

Dukić Samaržija et al. (2018) evaluated the relative efficiency of 28 public hospitals in Croatia for 2017 based on a specific diagnosis-related groups (DRG) procedure. The results obtained by the input-oriented DEA model under the assumption of variable returns to scale indicate that Croatian hospitals, regarding the mentioned procedure, operate at a similar efficiency level. This justifies the purpose of the introduction of the DRG payment system. Cumulatively observing the sources and amounts of relative inefficiency, the days of lying should be reduced the most.

Višić and Kordić (2021) use the Malmquist- DEA performance measure to estimate and analyze technological change and technical efficiency changes for sixteen Croatian for-profit nursing homes from 2015-2019. The authors conclude that although technological innovation shifted the relatively efficient

frontier to a higher level, the observed for-profit nursing homes were far from the best production frontier, highlighting managerial inefficiency.

In contrast to the studies above, a recent study by Buljan and Šimović (2022) investigates the healthcare system in Croatia. Using the dynamic DEA window analysis, the authors analyze the efficiency of the healthcare system based on a comparison with 21 selected EU countries from 2013 to 2018. The study finds that, in contrast to the systematic effectiveness and overall efficiency of expenditure on health care, cost-effectiveness is continuously at the maximum level.

This review of relevant literature and previous research has a common conclusion: the necessity of analyzing the efficiency of health care and its improvement through well-designed changes. It also indicates that there are few studies on the efficiency of Croatian healthcare, both in its individual sectors and the system as a whole. Moreover, none of them observes the dynamic efficiency of the hospital sector. Given that the availability and quality of hospital health care are affected by several factors, it is necessary to assess the efficiency of hospitals and focus on improving those hospitals and their inefficient resources. Selecting relevant indicators and choosing an appropriate method are critical steps in fulfilling this task.

This study seeks to investigate the comparative dynamic efficiency of Croatian general hospitals empirically. These 22 entities are considered for 1997-2021, employing a nonparametric DEA approach. In doing so, three hypotheses are put forward and tested. The first one predicts a continuous growth of comparative efficiency from year to year for most hospitals. In contrast, the second one assumes that most hospitals are ranked very differently from year to year. The third hypothesis considers that the number of discharged patients has the most significant impact on efficiency.

To meet these objectives, the paper is organized as follows. After the introduction, the second section briefly describes the selected indicators and the criteria for their selection, the data set, and the methodology exploited to evaluate relative efficiency. An evidence-based efficiency analysis of Croatian general hospitals is presented in the third section. The last section sums up the findings and provides concluding remarks.

2. DESIGNING A MODEL FOR EVALUATING THE EFFICIENCY OF HOSPITALS

The results of the relative performance assessment primarily depend on the selected performance indicators and the measurement model. This makes these two choices the first decisive and most challenging step in the modeling process.

Several indicators have been considered and ranked based on their relevance and data availability, and accessibility. Following the preliminary analysis results and the management's preferences, the returns to scale assumption and the model's orientation are chosen.

The set of DMUs includes 22 general hospitals in Croatia. As they all collect a large amount of data, the question arises of how to turn it into information and how to use it best to increase performance efficiency. The first step is to identify the performance results (outputs) that reflect the intended goals and the primary resources (inputs) used in doing so, i.e., to encompass core indicators of service delivery in the general hospital sector. Accordingly, four indicators have been selected – two inputs (number of beds and number of doctors) and two outputs (number of discharged patients and bed utilization). The reasons for choosing the mentioned indicators are as follows. The number of beds is chosen as the essential input, while the number of doctors is an important indicator of the conditions under which the treatment of patients takes place. The outputs are selected because they best reflect the part of the hospital's operations related to the treatment of inpatients, which has the largest share in the structure of the hospital's total revenues and expenses. When analyzing the results obtained from this research, it should be considered that the levels of the hospital's influence on a particular indicator are very different.

All indicators are collected annually and will be combined into a single efficiency measure. These indicators were collected from the Croatian Health Statistics Yearbooks 1997-2021, published by the Croatian Institute of Public Health[2]. Thus, the data set covers four indicators for 22 hospitals in 25 years and consists of 4 x 22 x 25, i.e., 2,200 data points. For this reason, the data is

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[2] Editions of the Croatian Health Statistics Yearbook are available starting in 1995, but the Vukovar Hospital was integrated into the Croatian health care system only in 1997 due to the events of the Homeland War. On the other hand, at the time of writing this paper, the 2022 edition of the yearbook was not yet available. For these reasons, 1997 is taken as the starting year, and 2021 as the final year of the observed period.

aggregated over time and over hospitals, and summary statistics for each of the four indicators are presented in Table 1.

Table 1. Data summary statistics, 1997-2021

Indicator		Mean	Median	St. dev.	Min.	Max.
Inputs	Beds	332.59	300.00	211.54	58.00	1,207.00
	Doctors	88.02	83.00	51.62	9.00	283.00
Output	Discharged patients	12,601.59	12,621,50	6,837.37	1,173.00	31,959.00
	Bed utilization	75.97	75.13	14.37	29.81	100.00

Source: Author's calculations based on data from the Croatian Institute of Public Health

Given that lower inputs and higher outputs lead to greater efficiency, the modeling goes in the direction of not increasing the number of beds and the number of doctors and not decreasing the number of discharged patients and the utilization of beds. Whether reducing input or increasing output is prioritized depends on the model's orientation, which results from a management decision.

The data envelopment analysis is a nonparametric method introduced by Charnes et al. (1978), which measures the performance efficiency of a set of entities, i.e., decision-making units (DMUs). Each DMU uses inputs to generate outputs, and the sets of inputs and outputs are the same for all DMUs and encapsulate their performance. The less input it uses and the more output it produces, the more efficient the DMU is compared to its peers.

The two most widely applied are the basic DEA models – CCR proposed by Charnes, Cooper, and Rhodes (1978) and BCC proposed by Banker, Charnes, and Cooper (1984). Depending on the characteristics of the process being analyzed, the model is built on the assumption of constant (CCR) or variable (BCC) returns to scale. Besides, the model could be oriented to input reduction or output augmentation. For reasons explained in the model application section, an output-oriented model that assumes variable returns to scale is chosen for this study.

As per Cooper et al. (2006), a set of n DMUs is considered. (DMU_j, $j=1, 2, \ldots, n$) and each of them consumes m inputs to generate s outputs. The $x_j=\{x_{ij}, i=1, 2, \ldots, m\}$ represents the input vector, and $y_j=\{y_{rj}, r=1, 2, \ldots, s\}$ the output vector of DMU_j. The data set is given by the input matrix $X=(x_{ij}, i=1, 2, \ldots, m, j=1, 2,\ldots, n)$ and the output matrix $Y=(y_{rj}, r=1, 2,\ldots, s, j=1, 2, \ldots, n)$ Estimating

the efficiency of DMU_o, $o \in \{1, 2,\ldots, n\}$ implies the creation of a virtual DMU that is supposed to be better (or at least not worse) than DMU_o. Its inputs and outputs are constructed as linear combinations of inputs and outputs of efficient DMUs in a given DMU set, i.e., $X\lambda$ and $Y\lambda$, where $\lambda=(\lambda_1, \lambda_2,\ldots, \lambda_n)$, $\lambda>0$ indicates the proportions in which these DMUs contribute to the projection of the inefficient DMU_o on the efficient frontier. e is a row vector with all elements equal to 1. With an efficiency score equal to 1, the efficient DMUs form the efficient frontier and represent the best practice benchmarks available within the sample. The DEA model in the form of a linear program is shown below.

Output-oriented model

$$\max \eta_B \tag{1}$$

subject to

$$xo \geq X\lambda \tag{2}$$

$$\eta_B\, y_o \leq Y\lambda \tag{3}$$

$$e\lambda=1 \tag{4}$$

$$\lambda \geq 0 \tag{5}$$

The formulae (1)-(5) form the BCC output-oriented model as the primary model on which the extended model used in this paper is based.

As a conventional DEA model, the above model assumes all input and output variables are controlled by decision-makers, i.e., the values of input and output variables can be arbitrarily adjusted. On the other hand, there are cases where one or more variables cannot be below and/or above a specific value[3]. Accordingly, a new matrix-vector formulation is introduced, in which X^C, Y^C denote the matrices of "controllable" variables and $x_o^{\,C}$, $y_o^{\,C}$ denote the corresponding vectors of observed values for the DMU_o being evaluated. The matrices X^B, Y^B, on the other hand, denote the data on the bounded variables that are to be evaluated relative to the vectors $x_o^{\,B}$, $y_o^{\,B}$ for the same DMU_o. In order to cope with these situations, the constraints (2) and (3) are relaxed with upper/lower bounds constraints and replaced as follows ((2a) and (2b) instead of (2), (3a) and (3b) instead of (3)):

$$x_o^{\,C} \geq X^C\lambda \tag{2a}$$

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[3] For example, if the variable represents the gross salary, it cannot be reduced below the gross minimum wage, which currently amounts to 700 euros in Croatia. On the other hand, if the variable represents a share of the whole, it cannot exceed 100%.

$$l_o^{Bx} \leq X^B \lambda \leq u_o^{Bx} \qquad (2b)$$

$$\eta_B y_o^{C} \leq Y^C \lambda \qquad (3a)$$

$$l_o^{By} \leq Y^B \lambda \leq u_o^{By} \qquad (3b)$$

where (l_o^{Bx}, u_o^{Bx}) and (l_o^{By}, u_o^{By}) are vectors of the lower and upper bounds to the bounded inputs and outputs of DMU_o, respectively.

To enable monitoring of dynamic comparative efficiency, this output-oriented bounded variable model is further combined with window analysis associated with data grouping of DMUs and introduced by Charnes and Cooper (1984). This approach analyzes a particular DMU's dynamic efficiency through periods called windows. This increases the number of DMUs by considering each DMU as a different DMU for each observed period. In doing so, the 25-year period 1997-2021, within which comparisons are made, can be divided into 1 to 25 sub-periods or windows[4].

This double-extended DEA model[5] provides valuable complementary information on the improvements suggested for inefficient DMUs, while still considering the assumption of variable returns to scale, the orientation to outputs, and the existence of bounded variables. The above makes this approach suitable for calculating relative efficiency and analyzing the obtained results, all following the recommendations are given by Dyson et al. (2001) and Cook et al. (2014) for using the DEA methodology.

3. EMPIRICAL ASSESSMENT OF THE COMPARATIVE EFFICIENCY OF HOSPITALS USING THE DOUBLE-EXTENDED DEA MODEL

The calculations for estimating the relative efficiency of 22 Croatian general hospitals are made using the DEA-Solver-Pro software. The analysis is made using a combination of three DEA output-oriented models with variable returns to scale assumption: (1) primary, (2) bounded variable, and (3) window analysis. The need for these models and their coupling is explained below.

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[4] For example, a window length of five corresponds to 21 windows (1997-2001, 1998-2002, …, 2017-2021).

[5] The specific reasons for selecting this model will be explained in the next section on its application.

Although they are crucial for choosing the model type, the characteristics of the production frontier in the case of hospital performance could not be determined with certainty. This is why the preliminary analysis was performed under constant and variable returns to scale assumptions. The differences between the results obtained by the CCR and BCC models were significant, which can be attributed to the return effect given the range of activities. This makes the BCC model more suitable for this research. In addition, output orientation was chosen as more appropriate because the primary goal of the healthcare system is to reduce waiting lists, which is a direct result of more discharged patients (as an output), rather than reducing the number of beds and/or doctors (as inputs).

Because a variable cannot be increased arbitrarily, the basic BCC model is unsuitable and should be extended. This variable is bed utilization which represents the average number of days in a year when a hospital bed was occupied as % of the available 365 days, and as such, cannot exceed 100%. This output is therefore treated as a bounded variable with an upper bound of 100%, and the status quo is used for every hospital as a lower bound. The constraints regarding other variables remain unchanged. Unlike the number of discharged patients, bed utilization is an indirect output that affects the objective value by constraining the feasible region. These two outputs are nevertheless connected because an increase in the number of discharged patients increases the number of bed days and, thus, the bed utilization.

In order to detect trends in the entity's performance over time, the bounded variable model is further extended by DEA window analysis. In this way, the performance of that entity in a certain period is contrasted with the performance of other entities during all observed periods and with its performance in another period(s). The problem occurs for inefficient entities because window analysis models do not provide projection values of input and output variables. Consequently, a new type of model had to be designed as follows. The basic model includes 25 sets of annual data on four selected indicators for each of the 22 hospitals. Each hospital is represented by 25 entities, which makes 550 entities, each assigned one efficiency rating. For this study, a single window covering the entire period is used. The combined model is proposed because it leaves unchanged the relative efficiency scores calculated by the window analysis using a single 25-year window and, at the same time, provides several results that are directly applicable in practice. As shown in Table 2, these efficiency scores allow a clear and straightforward ranking of all hospitals each year. Two hospi-

tals are efficient in one year, six in two years, one in three years, and one in five (including three consecutive) of the 25 observed years. The maximum number of efficient hospitals in one year (1997) is four; in even twelve years, there is no efficient hospital.

The results show significant differences between hospitals. The efficiency scores range between 0.14 and 1, but the average efficiency by year ranges between 0.60 in 2020 and 0.82 in 2006, and the trend is relatively constant (Figure 1). The overall average efficiency is 0.75. The most dramatic drop in average efficiency was recorded in 2020, primarily due to the 17.17% reduction in hospitalizations due to the Covid-19 pandemic. This consequently led to a decrease in bed utilization by 18.17%.

On the other hand, in the same year, the number of beds increased by 0.35% and the number of doctors by 1.31%. This led to a decline in average efficiency from 0.74 in 2019 to 0.60 in 2020. 2020 was also the year in which the lowest average efficiency was achieved in the observed 25-year period. After that, the average efficiency began to recover, and 2021 reached a value of 0.65, which is not even close to the value from 2019. It will therefore be interesting to investigate the trend of average efficiency in the coming years, defined on the same set of entities and with the same set of indicators, to determine how permanent the effects of the Covid-19 pandemic are on the hospital healthcare system.

Table 2. Relative efficiency scores and rankings of general hospitals, 1997-2021

General hospital	Score/Rank															
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Zabok	0.66/18	0.71/15	0.61/17	0.62/18	0.67/17	0.68/18	0.77/14	0.69/19	0.78/17	0.87/9	0.96/5	0.95/6	0.81/9	0.85/5	0.78/8	0.82/6
Sisak	0.73/15	0.79/10	0.75/12	0.70/15	0.72/15	0.77/15	0.81/12	0.83/9	0.84/9	0.83/15	0.80/14	0.77/14	0.70/17	0.63/18	0.64/19	0.60/19
Karlovac	0.74/14	0.74/14	0.76/11	0.76/11	0.77/10	0.81/9	0.83/8	0.81/11	0.78/16	0.78/17	0.76/17	0.74/16	0.71/16	0.70/14	0.68/14	0.68/14
Ogulin	0.71/17	0.84/8	1/1	0.84/8	0.83/7	0.77/12	0.91/4	1/1	0.97/2	1/1	1/1	1/1	0.91/5	0.63/19	0.72/12	0.69/12
Varaždin	1/1	0.98/4	0.97/4	0.96/4	0.96/3	0.96/2	0.96/3	0.93/3	0.96/3	0.97/3	0.97/4	0.99/3	0.96/1	0.92/2	0.91/2	0.86/2
Koprivnica	0.93/7	1/1	0.98/3	0.96/5	0.98/2	0.99/1	0.99/1	0.98/2	0.92/5	0.92/6	0.94/6	1/1	0.91/3	0.87/4	0.83/5	0.83/5
Bjelovar	1/1	1/1	0.76/10	0.74/12	0.73/12	0.78/11	0.79/13	0.82/10	0.83/10	0.83/13	0.82/13	0.81/12	0.74/13	0.76/9	0.74/11	0.76/10
Gospić	0.93/6	0.41/21	0.55/19	0.52/20	0.46/21	0.47/21	0.47/20	0.76/16	0.74/18	0.76/18	0.68/20	0.73/17	0.67/18	0.54/21	0.45/21	0.48/21
Virovitica	0.85/9	0.82/9	0.72/14	0.71/14	0.72/13	0.88/5	0.90/5	0.86/7	0.91/7	0.94/5	0.88/10	0.87/9	0.78/10	0.73/12	0.66/16	0.64/18
Požega	0.71/16	0.70/16	0.67/16	0.68/16	0.70/16	0.70/17	0.73/16	0.79/14	0.79/15	0.84/12	0.82/12	0.81/11	0.72/15	0.67/16	0.66/17	0.68/13
Pakrac	1/1	0.58/19	0.69/15	1/1	1/1	0.77/13	0.82/10	0.54/20	0.64/20	0.66/20	0.68/19	0.73/18	0.67/20	0.71/13	0.69/13	0.70/11
Slavonski Brod	0.99/5	1/1	0.94/6	0.92/6	0.88/5	0.85/7	0.97/2	0.88/5	0.93/4	0.96/4	1/1	0.95/5	0.89/6	0.84/7	0.78/7	0.78/8
Nova Gradiška	0.56/21	0.55/20	0.52/21	0.52/21	0.60/19	0.87/6	0.68/18	0.74/17	0.72/19	0.91/7	0.78/15	0.80/13	0.78/11	0.75/10	0.78/9	0.66/16
Zadar	0.86/8	0.78/11	0.79/8	0.80/9	0.82/9	0.80/10	0.84/7	0.86/6	0.86/8	0.85/11	0.89/8	0.92/7	0.91/4	0.95/1	0.92/1	1/1
Našice	0.58/20	0.64/17	0.53/20	0.53/19	0.55/20	0.58/20	0.67/19	0.80/13	0.92/6	0.72/19	0.69/18	0.68/20	0.67/19	0.66/17	0.67/15	0.68/15
Šibenik	0.66/19	0.59/18	0.61/18	0.64/17	0.60/18	0.65/19	0.70/17	0.70/18	0.80/13	0.86/10	0.91/7	0.73/19	0.74/12	0.75/11	0.74/10	0.77/9
Knin	1/1	0.88/6	0.95/5	1/1	0.83/8	0.92/4	0.43/22	0.28/22	0.24/22	0.22/22	0.18/22	0.14/22	0.30/22	0.28/22	0.29/22	0.29/22
Vinkovci	0.77/11	0.93/5	0.98/2	0.99/3	0.85/6	0.82/8	0.82/9	0.81/12	0.80/14	0.89/8	0.76/16	0.75/15	0.72/14	0.67/15	0.65/18	0.65/17
Vukovar	0.44/22	0.39/22	0.40/22	0.40/22	0.40/22	0.41/22	0.47/21	0.53/21	0.52/21	0.53/21	0.54/21	0.53/21	0.44/21	0.56/20	0.55/20	0.52/20
Pula	0.81/10	0.87/7	0.86/7	0.89/7	0.91/4	0.93/3	0.88/6	0.89/4	1/1	0.99/2	1/1	0.97/4	0.92/2	0.88/3	0.91/3	0.84/3
Dubrovnik	0.76/12	0.78/12	0.78/9	0.79/10	0.76/11	0.77/14	0.75/15	0.77/15	0.80/12	0.83/14	0.88/9	0.91/8	0.84/8	0.85/6	0.83/6	0.81/7
Čakovec	0.74/13	0.78/13	0.75/13	0.72/13	0.72/14	0.75/16	0.82/11	0.85/8	0.81/11	0.81/16	0.84/11	0.87/10	0.85/7	0.83/8	0.83/4	0.83/4
Mean	0.79	0.76	0.75	0.76	0.75	0.77	0.77	0.78	0.80	0.82	0.81	0.80	0.76	0.73	0.71	0.71
Median	0.76	0.78	0.75	0.75	0.74	0.78	0.81	0.81	0.81	0.84	0.83	0.81	0.76	0.74	0.73	0.70
Min.	0.44	0.39	0.40	0.40	0.40	0.41	0.43	0.28	0.24	0.22	0.18	0.14	0.30	0.28	0.29	0.29
Max.	1	1	1	1	1	0.99	0.99	1	1	1	1	1	0.96	0.95	0.92	1
Rank	5	11	14	12	16	9	8	7	4	1	2	3	13	19	20	21

Table 2. Relative efficiency scores and rankings of general hospitals, 1997-2021 (continued)

General hospital	Score/Rank									Score					Rank		
	2013	2014	2015	2016	2017	2018	2019	2020	2021	Mean	Median	Min.	Max.	St. dev.	Mean	Best	Worst
Zabok	0.82/5	0.84/3	0.83/9	0.81/8	0.86/6	0.80/6	0.85/6	0.69/6	0.64/12	0.78	0.80	0.61	0.96	0.09	9	3	19
Sisak	0.63/15	0.63/18	0.59/21	0.56/21	0.49/21	0.57/20	0.57/20	0.52/17	0.32/22	0.67	0.70	0.32	0.84	0.12	19	9	22
Karlovac	0.63/16	0.65/16	0.84/8	0.73/16	0.75/14	0.72/15	0.71/16	0.61/11	0.65/11	0.73	0.74	0.61	0.84	0.06	13	8	17
Ogulin	0.56/19	0.51/20	0.77/15	0.67/20	0.69/17	0.66/18	0.64/18	0.49/19	0.49/18	0.77	0.77	0.49	1	0.17	11	1	20
Varaždin	0.83/3	0.84/4	0.98/1	0.98/2	0.96/3	0.95/2	0.93/3	0.74/4	0.90/3	0.93	0.96	0.74	1	0.06	1	3	4
Koprivnica	0.85/2	0.78/7	0.76/16	0.72/17	0.72/15	0.70/16	0.67/17	0.57/14	0.61/14	0.86	0.91	0.57	1	0.13	4	1	17
Bjelovar	0.74/10	0.74/10	0.82/13	0.75/14	0.76/12	0.75/12	0.72/15	0.58/12	0.45/19	0.77	0.76	0.45	1	0.10	12	1	19
Gospić	0.53/20	0.78/8	0.95/3	1/1	0.99/1	1/1	0.98/2	0.77/2	0.91/2	0.70	0.73	0.41	1	0.20	17	1	21
Virovitica	0.69/11	0.66/15	0.77/14	0.72/18	0.76/11	0.78/8	0.76/9	0.64/9	0.70/8	0.77	0.76	0.64	0.94	0.09	10	5	18
Požega	0.67/14	0.70/13	0.82/11	0.75/13	0.70/16	0.74/13	0.76/10	0.56/15	0.63/13	0.72	0.70	0.56	0.84	0.07	16	10	17
Pakrac	0.69/12	0.71/12	0.87/4	0.79/10	0.67/19	0.68/17	0.79/7	0.47/20	0.55/17	0.72	0.69	0.47	1	0.13	15	1	20
Slavonski Brod	0.75/9	0.72/11	0.76/17	0.83/7	0.68/18	0.76/10	0.75/12	0.64/8	0.66/9	0.84	0.85	0.64	1	0.11	5	1	18
Nova Gradiška	0.60/18	0.59/19	0.63/20	0.69/19	0.59/20	0.65/19	0.61/19	0.51/18	0.57/16	0.67	0.65	0.51	0.91	0.11	20	6	21
Zadar	0.89/1	0.89/1	0.82/12	0.85/5	0.77/9	0.87/5	0.86/5	0.76/3	0.89/4	0.86	0.86	0.76	1	0.06	3	1	12
Našice	0.68/13	0.63/17	0.83/10	0.78/11	0.76/10	0.79/7	0.75/11	0.55/16	0.71/7	0.68	0.68	0.53	0.92	0.10	18	6	20
Šibenik	0.78/8	0.81/6	0.87/6	0.77/12	0.75/13	0.75/11	0.77/8	0.61/10	0.66/10	0.73	0.74	0.59	0.91	0.08	14	6	19
Knin	0.31/22	0.27/22	0.31/22	0.29/22	0.32/22	0.33/22	0.35/22	0.32/22	0.43/20	0.45	0.31	0.14	1	0.28	22	1	22
Vinkovci	0.62/17	0.67/14	0.69/18	0.92/4	0.99/2	0.93/4	0.91/4	0.70/5	0.76/5	0.80	0.80	0.62	0.99	0.11	7	2	18
Vukovar	0.49/21	0.42/21	0.68/19	0.73/15	0.88/5	0.56/21	0.49/21	0.38/21	0.42/21	0.51	0.49	0.38	0.88	0.11	21	5	22
Pula	0.82/4	0.82/5	0.86/7	0.80/9	0.76/10	0.77/9	0.73/14	0.67/7	0.75/6	0.86	0.87	0.67	1	0.08	2	1	14
Dubrovnik	0.78/7	0.74/9	0.87/5	0.85/6	0.79/7	0.73/14	0.74/13	0.57/13	0.61/15	0.78	0.78	0.57	0.91	0.07	8	5	15
Čakovec	0.79/6	0.85/2	0.97/2	0.94/3	0.90/4	0.95/3	0.99/1	0.87/1	0.95/1	0.84	0.83	0.72	0.99	0.08	6	1	16
Mean	0.69	0.69	0.79	0.77	0.75	0.75	0.74	0.60	0.65	0.75							
Median	0.69	0.71	0.82	0.78	0.76	0.75	0.75	0.59	0.64		0.76						
Min.	0.31	0.27	0.31	0.29	0.32	0.33	0.35	0.32	0.32			0.14					
Max.	0.89	0.89	0.98	1	0.99	1	0.99	0.87	0.95				1				
Rank	23	22	6	10	15	17	18	25	24								

Source: Author's calculations using DEA-Solver-Pro

Figure 1. Relative efficiency scores of hospitals – annual average scores
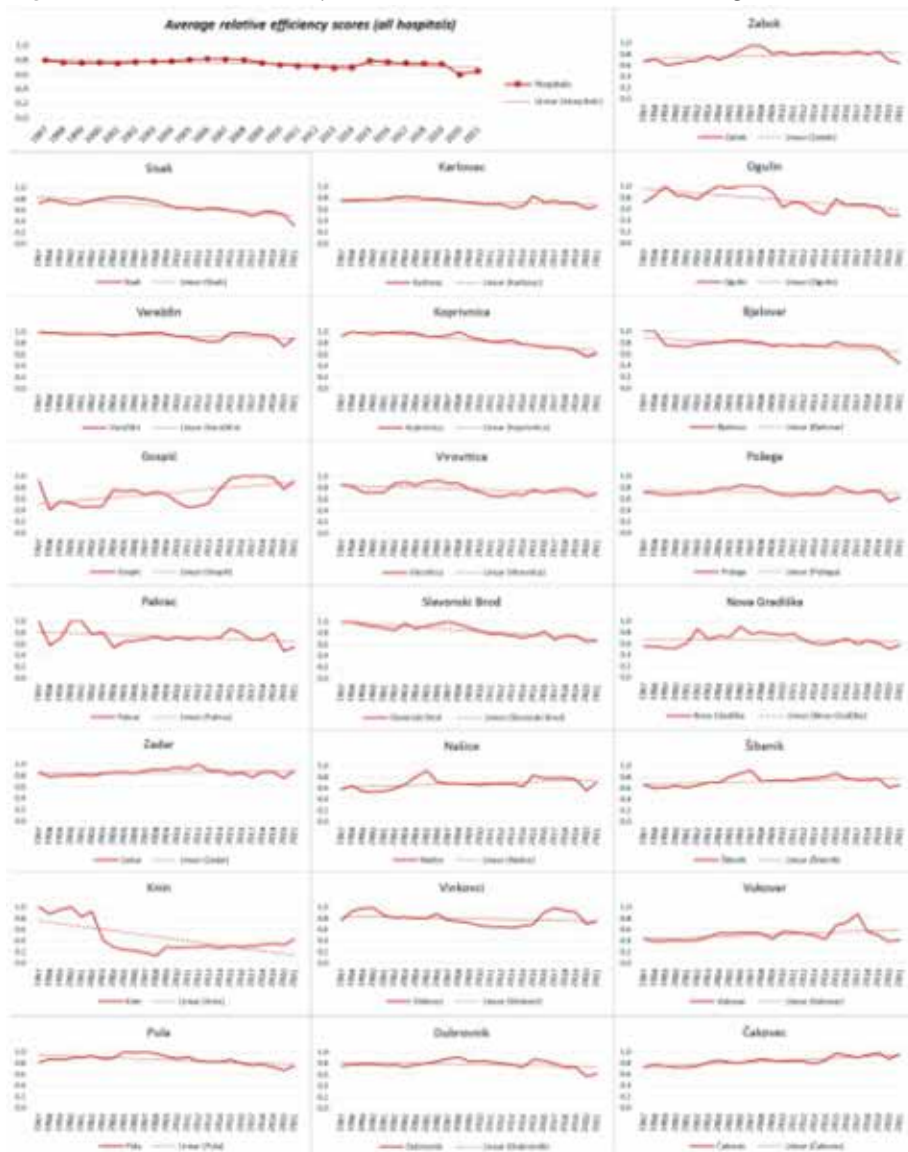
Source: Author's work based on DEA-Solver-Pro calculations

Figure 1 also shows the efficiency of each hospital in each of the observed years. Looking at trends over time, it can be concluded that the efficiency of most hospitals tends to decline. This is most pronounced in the case of Knin, whose efficiency amounts also have the highest standard deviation. On the other hand, the efficiencies of the hospitals that show a growth trend are not

continuously increasing but rather alternate between growth and decline in efficiency from year to year. The most prominent example is Gospić, which, along with Knin, has the highest standard deviation of efficiency. Based on this data, the first hypothesis of this research, which predicted a continuous growth of comparative efficiency from year to year for most hospitals, is rejected.

Generally speaking, the average efficiency score for each hospital is below one, indicating a certain degree of inefficiency for all of them. On average, Varaždin is the most efficient (0.93), and Knin is the least efficient (0.45). The worst efficiency score was achieved in 2008, also by Knin. At the same time, Ogulin, which has been efficient for more years than any other observed hospital, achieved an average efficiency of only 0.77 and was thus ranked only 11th.In studies where a set of entities is considered over a more extended period, a particular entity often fails to preserve its relative efficiency from year to year but is ranked very differently. This can be caused, on the one hand, by a fundamental weakening or strengthening of its performance, and on the other hand, by a significant improvement or deterioration of the performance and, consequently, the relative efficiency of other entities from the observed group. In both cases, the efficiency of the observed entity varies over time. This is the reason for the second hypothesis, which assumes that most hospitals are ranked differently yearly.

As can be seen from Table 2, the ranks of each hospital in different years are pretty diverse. This is most pronounced in the case of Knin, which is ranked from the first position (in 1997 and 2000) to the last position (continuously from 2003 to 2020), and in the case of Gospić, which is ranked from the first (in the period 2016-2018) to the penultimate position (in the periods 2001-2002 and 2010-2012). This confirms the second hypothesis of this research.

All observed variables affect efficiency and need to be improved, each to a certain extent. These improvements are differences between empirical and projected input and output values. There are, in total, 2,200 proposed improvements[6], and it would be unwieldy to list all of them. Therefore, they are averaged over the observed period, and the obtained values are given in Table 3.

These figures result in some valuable findings. First, inputs and outputs cause inefficiency, each to a different extent. The number of discharged patients is the

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[6] 22 entities x 4 variables x 25 years

most severe inefficiency source, with an average required increase of 29.32%. To become relatively efficient, in addition to the above, hospitals should increase bed utilization by an average of 18.01% and, at the same time, reduce the number of doctors by an average of 14.80%. In comparison, the number of beds should be reduced the least – by an average of 0.08%. Such dominance of outputs over inputs in the required changes results in part from the choice of the model orientation.

Additional evidence supporting the claim that the number of discharged patients has the most significant impact on efficiency can be seen by comparisons at the level of individual hospitals (Table 3). In this sense, it is interesting to compare the two most efficient and the two least efficient hospitals. In the first case, Pula is more successful than Varaždin by all indicators except for the number of discharged patients, and the average efficiency of Varaždin (0.934) is higher than that of Pula (0.862). Similarly, in the second case, Vukovar is less successful than Knin in the same three out of four indicators, but its average efficiency is higher.

The above findings necessitate the acceptance of the third hypothesis that the number of discharged patients impacts efficiency most.

Table 3. Proposed input and output improvements per hospital (%), 2007-2020

General hospital	Inputs		Outputs	
	Beds	**Doctors**	**Discharged patients**	**Bed utilization**
Zabok	-0.61	-9.84	28.58	13.84
Sisak	-0.89	-3.71	48.45	27.46
Karlovac	0.00	-11.10	36.29	13.22
Ogulin	-2.60	-14.73	28.66	18.39
Varaždin	-0.21	-23.12	6.97	15.61
Koprivnica	-0.15	-0.70	17.27	12.63
Bjelovar	0.00	-8.85	30.29	15.25
Gospić	0.00	-2.40	51.82	31.35
Virovitica	-1.39	-5.44	29.08	13.42
Požega	0.00	-13.00	38.91	12.56
Pakrac	0.00	-22.27	43.43	25.25
Slavonski Brod	0.00	-17.84	18.30	5.03
Nova Gradiška	0.00	-33.94	51.74	22.16
Zadar	0.00	-4.86	16.46	12.76
Našice	-1.28	-29.08	48.17	27.71
Šibenik	0.00	-28.11	38.15	12.32

		-0.65	-8.63	191.10	50.99
Knin		-0.65	-8.63	191.10	50.99
Vinkovci		-2.08	-13.15	26.48	12.11
Vukovar		-1.68	-32.76	103.00	71.73
Pula		0.00	-14.28	15.96	4.66
Dubrovnik		0.00	-16.42	27.54	7.81
Čakovec		-1.92	-13.24	19.53	2.70
Overall average changes		-0.50	-14.80	29.32	18.01
Average changes	Median	-0.08	-13.20	29.68	13.63
	Minimum	**0.00** (11 hospitals*)	**-0.70** (Koprivnica)	**6.97** (Varaždin)	**2.70** (Čakovec)
	Maximum	**-2.60** (Ogulin)	**-33.94** (Nova Gradiška)	**191.10** (Knin)	**71.73** (Vukovar)

Note: * Karlovac, Bjelovar. Gospić, Požega, Pakrac, Slavonski Brod, Nova Gradiška, Zadar, Šibenik, Pula and Dubrovnik
Source: Author's calculations using DEA-Solver-Pro

As already emphasized, reducing waiting lists is extremely important for the healthcare system in Croatia. Accordingly, the required reduction in the number of beds and the number of doctors should not be understood in terms of actual implementation but in the context of measuring efficiency concerning other hospitals. This means that a hospital recommended to reduce the number of doctors will not start laying off doctors, as this would increase waiting lists and reduce the quality of health service. Inefficiency in the number of doctors indicates that some other hospitals achieve the same outputs with fewer doctors, which is evidence of inefficient use of resources.

The causes of all the findings mentioned above should be investigated in further research at the level of individual hospitals to advance their operations according to the previously formulated recommendations.

4. CONCLUDING REMARKS

The 22 general hospitals in Croatia were empirically analyzed based on the data for four healthcare performance indicators. An output-oriented data envelopment analysis model with the assumption of variable returns to scale is used. To consider the need to monitor dynamic efficiency while simultaneously using a variable that cannot exceed a certain level, the model was upgraded with two extensions, combined with two models – the window analysis model and the bounded variable model. The relative efficiency evaluation was made based on the comparison of annual data for the period from 1997 to 2021.

The conclusions derived from the dynamic analysis are as follows. Firstly, the efficiency of most hospitals tends to decline, while the efficiencies of the hospitals that show a growth trend are not continuously increasing but alternate between growth and decline in efficiency from year to year. Consequently, the first hypothesis that predicted a continuous growth of comparative efficiency from year to year for most hospitals is rejected. Secondly, the efficiency ranks that differ by 3 to as much as 21 places for each hospital prove the second hypothesis which assumed that most hospitals were ranked very differently from year to year. Thirdly, the number of discharged patients proved to be the most prominent inefficiency source, thus confirming the third hypothesis pointing to this outcome. On the other hand, the number of beds influences efficiency the least. The key objective is to diminish established differences between general hospitals and advance their relative efficiency by increasing output due to more rational use of existing resources.

The analysis carried out in this study is based on evidence. The findings offer valuable information for discussion and further considerations of the same or similar healthcare institutions. Health policymakers and managers are allowed to review and reformulate the current health policy to adapt it to the needs of patients and harmonize it with the staffing of health institutions. The research can also be extended to clinical and specialty hospitals.

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MENTAL HEALTH LITERACY IN THE FUNCTION OF HEALTH CARE FOR THE MENTAL HEALTH OF THE POPULATION IN THE REPUBLIC OF CROATIA

Agneza ALEKSIJEVIĆ, Ph.D.
University of Rijeka, Faculty of Health Studies

E-mail: agneza.aleksijevic@uniri.hr

Marko ALEKSIJEVIĆ, student
Josip Juraj Strossmayer University of Osijek,
Faculty of Dental Medicine and Health Osijek

E-mail: marko.aleksijevic@yahoo.com

Abstract

By focusing on preventive actions through mental health evaluation, promotion and preservation, this paper aims to encourage reflection on investing in mental health support system by promoting this global challenge and priority because mental health conditions contribute to poor health, premature death, human rights violations, global and national economic losses.

The paper aims to investigate mental health teams' activities in each period, show the average length of hospital stay at the Department of Psychiatry – Day Hospital, and raise awareness of the importance of preventive interventions during each individual's path toward development.

Data were collected through a systematic review and meta-analysis of the Croatian Health Statistics Yearbooks from 2016 to 2021.

The research results point to services and activities of mental health and addiction prevention teams. Significantly more activities, 359,225 in total, were provided by the mental health and prevention team in 2019, and the fewest activities were provided in 2016, with a tendency to grow. The COVID-19 pandemic and restrictive measures in 2020 scaled-down activities to the level of 2018, but

as soon as 2021, a significant increase compared to 2020 can be noticed. The average treatment duration in day hospitals is significantly longer compared to other given years and amounted to 12.96 days for 20,714 patients, while the total number of treatment days amounted to 268,353 in 2020. The lowest recorded average treatment duration in day hospitals was 6.97 days for 37,303 patients, and the total number of treatment days amounted to 259,392 in 2016. Compared to other activities expressed in treatment days, the average treatment duration in psychiatric day hospitals is significantly longer.

The World Health Organization (WHO) calls on all stakeholders "to work together to deepen the value and commitment to mental health, reshape the environments that affect mental health and strengthen the systems that care for mental health." With the application of evidence-based tools, interest in and understanding of mental health is expected at the global level.

Keywords: mental health, population literacy, preventive actions

JEL Classification: I12

1. INTRODUCTION

"But, most importantly, be gentle with yourself. To be able to talk to others about your mental health, it is important to know yourself. To find yourself surrounded by your thoughts in silence and to feel what your body is telling you. Living an authentic life is an act of bravery. Look inside yourself and see who the person in the mirror is. If it does not work right away, give yourself time. They say that the most beautiful form of love is when you are patient with someone and give others the space to be themselves and let them know you are there. Now do the same for yourself."

Pogled u sebe CroMSIC project team
– Croatian Medical Students' International Committee

"Mental health conditions are increasing worldwide. Mainly because of demographic changes, there has been a 13% rise in mental health conditions and substance use disorders in the last decade (to 2017). Mental health conditions now cause 1 in 5 years to live with a disability. Around 20% of the world's children and adolescents have a mental health condition, with suicide the second leading cause of death among 15-29-year-olds. Approximately one in five people in post-conflict settings have a mental health condition" (WHO, 2023).

Mental health conditions can substantially affect all areas of life, such as school or work performance, relationships with family and friends and ability to

participate in the community. "Two of the most common mental health conditions, depression and anxiety, cost the global economy USD 1 trillion annually. Despite these figures, the global median of government health expenditure on mental health is less than 2%" (WHO, 2023).

Mental health care in Europe is based on shared values and principles, including universality, solidarity, availability and efficiency, and high quality and safety of health care. The fundamental value is the empowerment of citizens for active participation in the planning and implementation of activities in the field of health protection. The provision of services is being redirected from large institutions to services that can be provided at a local community level. Significant attention should be paid to the quality and uniformity of protection, especially in applying new measures, services or technologies, to avoid ethical problems, raise the level of trust and satisfaction of citizens and avoid an unfavorable cost-effectiveness ratio (Ministry of Health, 2022:22).

Mental health is included in sustainable development goals in achieving global development goals. The World Health Organization (WHO) initiative is to improve mental health policies, human rights, quality of interventions and services for people in need. The WHO announced this initiative in a program that will contribute to the Global Goals (GPW13) and the Sustainable Development Goals (SDGs) (Figure 1) (WHO, 2019).

Figure 1. The WHO Special Initiative for Mental Health Theory of Change
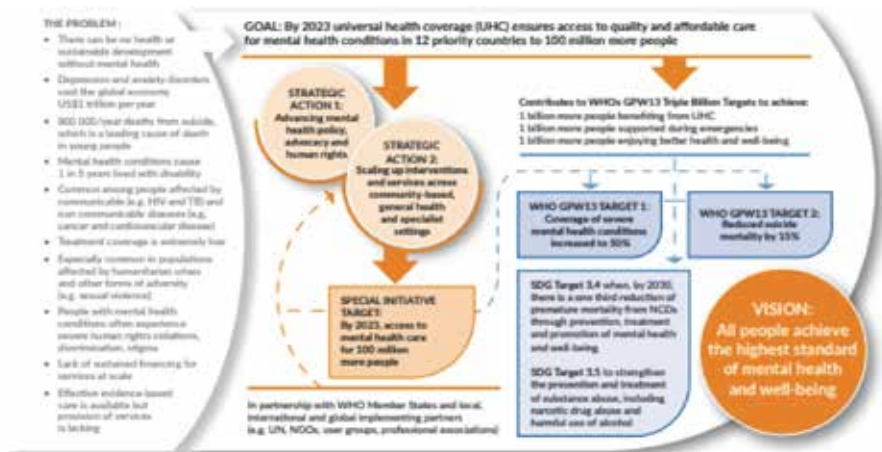
Source: WHO, 2019

More investments are necessary at all levels since effective treatment is unsatisfactory despite low treatment costs. "The gap between people who need care and those who have access to care remains significant." We need to empower communities and individuals so that all people achieve the highest standard of mental health and well-being. Two strategic actions will be implemented, each with different expected outputs, shown in the table (Figure 2) (WHO, 2019).

Figure 2. Two strategic actions

STRATEGIC ACTION 1: ADVANCING MENTAL HEALTH POLICIES, ADVOCACY AND HUMAN RIGHTS	STRATEGIC ACTION 2: SCALING UP INTERVENTIONS AND SERVICES ACROSS COMMUNITY-BASED, GENERAL HEALTH AND SPECIALIST SETTINGS
1. Globally, mental health is positioned high on the development and humanitarian agendas	1. Quality, affordable mental health care is scaled up across health and social services
2. Local champions, people who use mental health services, and their organizations are empowered to participate in the development and implementation of mental health policies, strategies, laws and services	2. Quality, affordable mental health care is integrated in relevant programmes (e.g. for HIV, gender-based violence, disabilities)
3. Mental health policies, strategies and laws are developed and operationalized based on international human rights standards	3. Mental health and psychosocial support is included for preparedness, response and recovery in emergencies
4. Media and community awareness about the importance of mental health across the life course is raised	4. Priority interventions for groups in positions of vulnerability (e.g. women, children, youth, older people, staff) are developed and implemented
5. Human and financial resources for mental health are brought in line with the needs	5. Implementation is documented, monitored and evaluated to improve services

Source: WHO, 2019

In 2018, there were 73 hospital beds for psychiatric care per 100,000 inhabitants in the European Union (EU). This corresponds to 14% of all hospital beds. In 2004, the first year for which data are available at the EU level, the number of hospital beds for psychiatric care per 100,000 inhabitants amounted to 79. Since then, the rate has been continuously decreasing. Among EU Member States, Belgium recorded the highest rate in 2018, with 135 psychiatric hospital beds per 100,000 inhabitants, followed by Germany (128; data for 2017) and Latvia (122). At the other end of the rankings, Italy recorded nine psychiatric beds per 100,000 inhabitants, Cyprus had 18 and Ireland 34 (Figure 3) (Figure 4) (Eurostat, 2020).

Figure 3. Hospital beds by type of care; Psychiatric care beds in hospitals

GEO / TIME	2020	2019	2018	2017	2016
European Union - 27 countries	:	73.12	73.19	73.72	74.16
European Union - 28 countries	:	:	68.49	69.17	69.73
Belgium	:	140.92	135.22	136.08	138.47
Bulgaria	:	57.14	56.84	58.01	56.22
Czechia	:	92.48	92.75	93.77	95.34
Denmark	:	51.63	48.21	48.73	39.72
Germany (until 1990 former t	:	136.60	129.67	128.15	127.54
Estonia	:	50.84	51.59	51.24	51.00
Ireland	:	32.89	33.57	34.13	34.28
Greece	:	71.45	73.92	73.60	70.75
Spain	:	36.05	34.10	36.05	35.52
France	:	81.77	82.69	83.77	85.93
Croatia	:	93.77	92.25	94.02	82.42
Italy	:	8.14	8.87	9.19	9.15
Cyprus	:	15.42	17.81	21.17	21.84
Latvia	:	119.13	123.46	125.11	127.58
Lithuania	:	97.42	97.62	99.14	100.60
Luxembourg	:	81.13	74.18	75.63	77.47
Hungary	:	84.37	84.77	87.00	86.81
Malta	:	89.67	105.03	114.06	121.96
Netherlands	:	80.11	86.40	93.59	97.41
Austria	:	88.68	72.69	74.85	74.66
Poland	:	63.28	63.23	65.14	65.93
Portugal	:	63.05	63.60	63.77	64.24
Romania	:	85.74	85.44	85.20	84.84
Slovenia	:	65.31	65.63	65.96	66.15
Slovakia	:	80.87	81.02	81.45	81.30
Finland	:	59.15	53.67	39.05	58.05
Sweden	:	40.59	40.94	42.68	43.24
Iceland	:	35.79	36.57	37.86	43.23
Liechtenstein	:	44.08	0.00	0.00	0.00
Norway	:	103.83	105.35	107.20	110.67
Switzerland	:	92.52	93.07	93.58	92.64
United Kingdom	:	:	36.90	38.45	38.72

Source: Eurostat, 2021

Figure 4. Hospital beds for psychiatric care
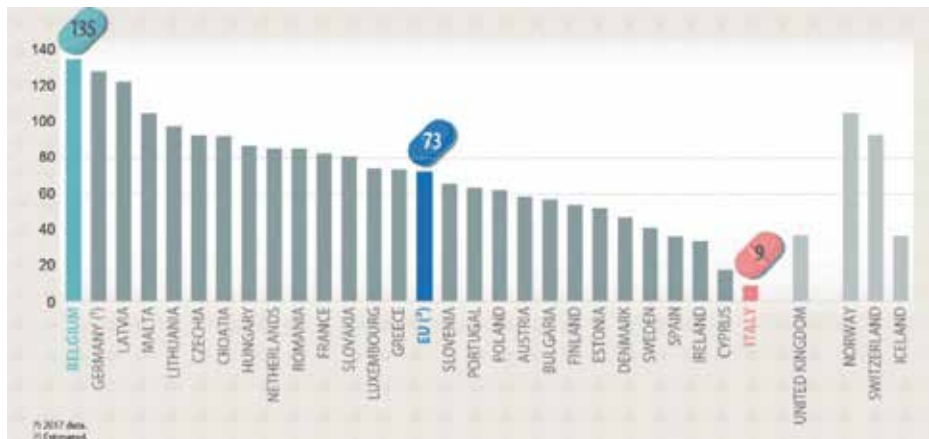
Source: Eurostat, 2018

According to the latest available data on the operation of inpatient institutions in 2021, the Republic of Croatia has 22,618 beds, 14,669 of which are acute and 7,949 are chronic. Of the total 22,618, 6,403 beds are available in general hospitals, 190 in inpatient clinics and health centers, 8,862 in clinical hospital centers, clinical hospitals and clinics, and 7,163 in particular hospi-

tals, spas and hospices. The total number of doctors in inpatient institutions is 7,406, while the number of beds per doctor amounts to 3.05. The average treatment duration amounts to 7.77. Bed utilization is 59.24%. The number of patients per bed is 27.84, while the turnover interval is 5.34.

The average treatment duration at psychiatry departments in the Republic of Croatia is 12.63, and the number of beds per 1,000 inhabitants is 0.26. For chronic mental illnesses, the average treatment duration is 48.20, and the number of beds per 1,000 inhabitants is 0.70.

2. LITERATURE OVERVIEW

Digital health creates opportunities for creating new effective models of mental health care – from addiction recovery to suicide prevention. Anthropological methodologies provide opportunities to examine the field of global mental health. Contextual needs of mental health with an emphasis on the lived experience of illness, engagement with communities and knowledge of contexts, structures and systems can be used by practitioners and patients to create new models of care in the service of equitable and accessible recovery, guided by different mental health needs and conditions, as well as limitations of digital health (Kozelka et al., 2021:1).

Exercise improves the transmission of neurotransmitters that positively affect mood. Serotonin and dopamine secretion are reduced in individuals suffering from depression symptoms. Thus, exercise represents a natural way to stimulate their secretion. Furthermore, joining groups allows people suffering from depression to be included in society, which creates positive feelings that are the exact opposite of the symptoms of depression. Researchers report that aerobic and anaerobic exercise have a positive effect on reducing depression symptoms. Specific evidence indicates that aerobic exercise is better than anaerobic exercise in reducing depression symptoms but emphasizes the importance of exercise duration and intensity. Persistence in moderate to vigorous intensity exercise is essential for optimal results. The evidence states that exercise not only reduces depression symptoms in healthy individuals but can be combined with cognitive therapy and drug therapy in people who are already ill. Since depression drugs are mainly based on serotonin (secreted more during exercise), reducing drug therapy for people who exercise regularly is possible. Such an approach has been recognized by many countries, among which Belgium and Great Britain

stand out the most. Namely, they introduced mandatory thirty-minute exercises in smaller groups within psychiatric institutions. A positive impact was noticed after just a few months, and drug therapy was reduced (Marić, Lovrić & Franjić, 2020:109-110).

"It is possible to produce an extensive array of indicators about mental health. The conclusion from examining these indicators is that there are many unexplained differences in mental health across the regions of England. Many of these indicators are closely linked to deprivation. Some indicators show a tack of difference across the country, and in many instances, service provision is inconsistent and does not always relate to need. In some cases, there was a worrying absence of data, e.g., data on ethnicity and offenders' mental health "(Wilkinson et al., 2008:897).

The health and well-being of children, pupils and students, along with education, is one of the primary areas that are the responsibility of all employees in the education sector. All individuals working in preschool institutions, schools and other educational institutions are responsible for supporting and developing the mental, emotional, social and physical well-being of children and students. It is necessary to provide employees in the education system with appropriate continuous education and professional development and to promote good practices of positive relationships and behavior (Ministry of Health, 2022:29).

Specifically, women, faculty and staff of color, and non-heterosexual individuals reported worse health outcomes. Across eight mental health indicators, students reported consistently worse mental health than their faculty/staff counterparts. Conclusions: This paper presents findings from a significant campus-wide physical and mental health surveillance initiative. Results indicate the need for targeted physical and mental health support and intervention among these demographic groups (Hawley, 2016:174).

This study captured broad physical and mental health indicators. Students, faculty, and staff in certain demographic groups were more likely to report significant problems associated with mental and physical health.

We conducted a qualitative content analysis of advertising material for mental health apps found online in the United States, the United Kingdom, Canada, and Australia in late 2016. Apps were included if they explicitly referenced mental health diagnoses or symptoms, offered diagnosis and guidance, or made health claims. We identified 61 mental health apps: 34 addressed predominant-

ly anxiety, panic, and stress (56%), 16 addressed mood disorders (26%), and 11 addressed well-being or other mental health issues (18%). Apps described mental health problems as psychological symptoms, a risk state, or a lack of life achievements. Mental health problems were framed as present in everyone, but everyone was represented as employed, white, and in a family. Explanations about mental health focused on abnormal responses to mild triggers, with minimal acknowledgment of external stressors. Therapeutic strategies included relaxation, cognitive guidance, and self-monitoring. Apps encouraged frequent use and promoted personal responsibility for improvement. Mental health apps may promote the medicalization of normal mental states and imply individual responsibility for mental well-being. Within the healthcare clinician-patient relationship, such messages should be challenged, where appropriate, to prevent overdiagnosis and ensure supportive health care where needed (Figure 5) (Figure 6) (Parker et al., 2018:338).

Figure 5. Framing of Mental Health Problems in Advertising Material of Mental Health Apps

Apps' framing materials claimed a mental health problem exists when...

One has a psychological issue, such as distressing symptoms (eg, anxiety, depression, panic, poor sleep) and/or lack of positive psychological states (eg, happiness, balance)

One is at risk of having a psychological issue that is due to a lack of mental fitness

One's life lacks some external feature of success (eg, academic or relationship success)

App = mobile application.

Source: Parker et al., 2018:340

Figure 6. Dominant Messages about Epidemiology and Management of Mental Health Problems

Characteristic	Message and App
Population: everybody	"[A]ll kinds of people who, in certain situations, or in certain periods of life are: feeling stressed; need motivation and lack energy; people with mild mental distress, such as depressive disorders, anxiety, stress, and low self-esteem." Mindfit
Causation	
Pathophysiology	"The fight or flight response...can easily go into hyperdrive, making you feel uncomfortable and anxious even when you aren't in any real danger." Mindfulness: Brain-based
Psychological maladaptation	"[H]abits of thought and behaviors that are negatively impactful." Mindfulness Daily
Apps and management	
Easy, effective, no risk of harm	"All you have to do is LISTEN and your brain will do the rest!" Anxiety Release based on EMDR
Importance of regular, ongoing use	"You can...fit several mini-sessions into your day." Meditation Studio
Personal responsibility for improvement	"Take action to improve your life." MoodKit – Mood Improvement Tools

App = mobile application; EMDR = eye movement desensitization and reprocessing.

Source: Parker et al., 2018:340

This mixed multi-methods study collected data pre and post-training and three to six months post-training. Validated questionnaires, rating scales and open-ended questions were used to measure self-efficacy in health care skills, attitudes towards mental illness, and knowledge and confidence in working in mental health. A subsample of participants was interviewed post-training about how they had used the knowledge and skills learned (Figure 7) (Maindonald et al., 2020:223).

Figure 7. Kirkpatrick's four Levels of Evaluation

Level of Evaluation	Evaluation Description	Evaluation Methods
Reaction	Participants' satisfaction with the training	Post-training questionnaires* Post-training interviews
Learning	Changes in participants' confidence, mental health-related stigma, healthcare skills Improved mental-health knowledge	Pre and post-training questionnaires* Post-training interviews
Behaviour	Application of learning to the workplace	Post-training interviews
Results	Satisfaction with care received by people experiencing a mental health crisis or their carers or relatives	Post-training interviews (staff views on impact on patients and carers as a proxy measure of patient/carer views)

Source: Maindonald et al., 2020:225

This training improved mental health-related knowledge, confidence and self-efficacy and reduced mental health-related stigma in professionals who provide urgent care to people in mental health crisis. Participants reported changes to their practice following training; this is important as care has been inadequate for this group. Workforce planners and leaders should consider implementing this or similar training widely (Maindonald et al., 2020:223).

The systematic literature review includes all quantitative and qualitative study designs that use a specific framework or model to evaluate the impact of a population-based action on mental health or well-being. Studies measuring mental health impact on a strictly individual level were omitted, for example, those which evaluated "mental health impact of cognitive behavioral therapy on depression." Examples of inclusion and exclusion details are outlined (Figure 8) (Cresswell-Smith et al., 2022).

Table 8. Examples of inclusion and exclusion criteria.

Study Focus	Included	Excluded
All population groups (i.e., all ages)	x	
English, Swedish or Finnish language	x	
Mental health or mental wellbeing impact assessment in all contexts	x	
Reports or books outlining specific frameworks for mental health or mental wellbeing impact assessment	x	
Any impact assessments which include mental health components	x	
Mental health/mental wellbeing impact assessment on individual level		x
Reports or books outlining general approach or need with no outline of specific framework.		x

Source: Cresswell-Smith et al., 2022

One hundred forty-five records were identified from six databases (Figure 9).

Figure 9. Flow diagram of the article selection process
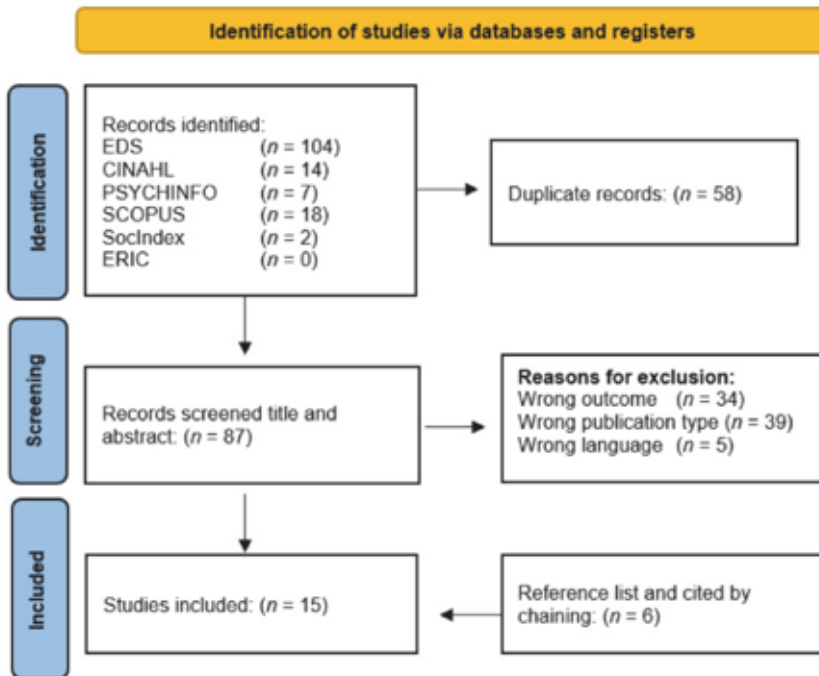
Source: Cresswell-Smith et al., 2022

This systematic review details how mental health Impact Assessment (IA) has been assessed in different circumstances. Developing accessible approaches

to mental health IA is timely considering the increased understanding of the influence of the daily environment on a population's mental health. Mental health IA frameworks offer concrete guidance on assessing the impact of broad actions. Findings from studies included in the current review highlight the need for including participatory approaches, which have the dual purpose of informing the IA evaluation and advocating for the need to attend to mental health (Cresswell-Smith et al., 2022).

"Digital mental health interventions are often touted as the global mental health crisis solution. However, moving mental health care from the hands of professionals and into digital apps may further isolate individuals who need human connection the most. This commentary argues that people, our society's greatest resource, are as ubiquitous as technology. Thus, we argue that research focused on using technology to support all people in delivering mental health prevention and intervention deserves greater attention in the coming decade" (Rudd & Beidas, 2020:1).

Croatia has opted to reorient mental health care in the community in which local communities play a significant role in encouraging positive mental health, prevention of mental disorders, treatment, rehabilitation and protection of mental health. The main goal of the Strategic Framework is to encourage the development and implementation of a comprehensive, integrated and effective mental health care system. Such a system includes a series of measures in each area mentioned above, which are the basis for creating action plans with local communities participating in their implementation. Various procedures are planned for all citizens in the area of improving mental health, prevention and timely recognition of mental health problems, such as increasing resistance to stress, increasing health literacy regarding mental health, combating stigmatization and discrimination against people with mental disorders, mental health protection at work (related to workplace stress) aimed at reducing the adverse effects of psychosocial stressors, including workplace burnout and prevention of workplace harassment, as well as timely recognition of mental health problems and encouraging the creation of healthy work environments (Štrkalj-Ivezić, 2022).

3. MATERIALS AND METHODS

We used publications by the Croatian Health Statistics Yearbook containing data and indicators on the work of health services in the function of mental

health in the health care system, as well as indicators on the mental health of the selected Croatian population groups. Data are collected from health institutions and general practitioner's offices from entire Croatia, regardless of the type of ownership and the type of health insurance of an individual patient. Mental health indicators indicate the current state and the monitoring of the movement of individual components and are the basis of the planning process at the national and local levels. Our realizations and conclusions were reached using inductive and deductive methods and analysis and synthesis methods.

4. RESULTS AND DISCUSSION

4.1. Overall activities of mental health and addiction prevention teams

"Mental disorders are characterized as psychological, biological and social dysfunction of an individual, and include an entire range of symptoms and disorders. They are defined according to the existence of sets of symptoms, and the criteria for the diagnosis are met when the sets of symptoms are relatively severe, long-lasting and accompanied by a decrease in functional ability or disability. Symptoms can exist even without fulfilling the criteria for clinical disorders as subclinical conditions "(Silobrčić-Radić & Švigir, 2022:1).

Of the total activities performed by mental health and addiction prevention teams in Croatia 2016–2021 period (2,025,398), the most activities were performed in 2016 – 315,851, and the fewest in 2018 – 333,113, with a tendency of growth during the given period, taking into account the period of the COVID-19 pandemic and restrictions on visits to institutions (Graph 1).

Graph 1. Activates of mental health care teams, addiction prevention, Croatia 2016–2021
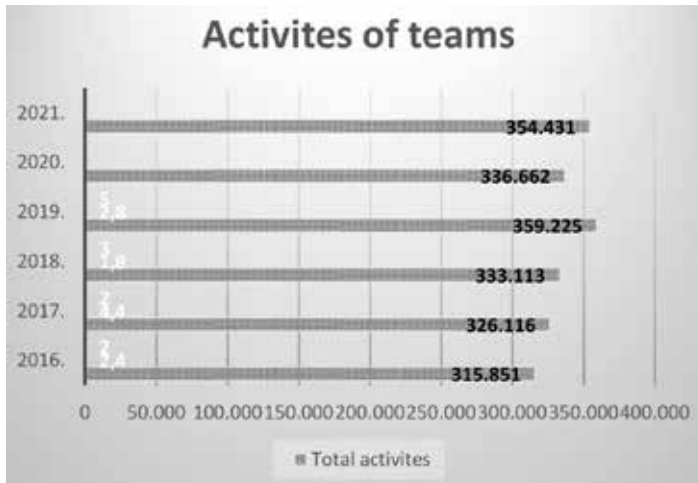
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Mental disorders caused by alcohol, schizophrenia, depressive disorders, mental disorders due to brain damage and dysfunction and physical illness and reactions to severe stress and adjustment disorders, including post-traumatic stress disorder (PTSD), as separate diagnostic categories, represent almost 60% of all causes of hospitalizations due to mental disorders. According to hospitalization treatment days, the leading diagnostic category is schizophrenia (Silobrčić-Radić & Švigir, 2022:2).

Of the total number of *Individual therapies* (1,413,697) in Croatia 2016–2021, the most therapies were administered in 2019 (253,191) and the fewest in 2020 (225,863) (Graph 2).

Graph 2. Activities of mental health care teams, *Individual therapy*, Croatia 2016–2021
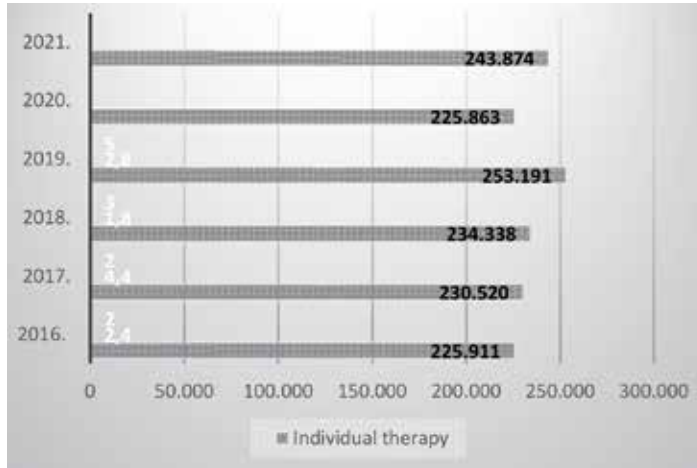
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

In the total number of registered illnesses and conditions at the primary health care level, mental disorders account for 4-5% (Silobrčić-Radić & Švigir, 2022:4).

Of the total *Family therapy* (61,050) in Croatia 2016–2021, most therapies were administered in 2017 (11,481), and the fewest in 2012 (9,090) (Graph 3).

Graph 3. Activities of mental health care teams, *Family therapy*, Croatia 2016–2021
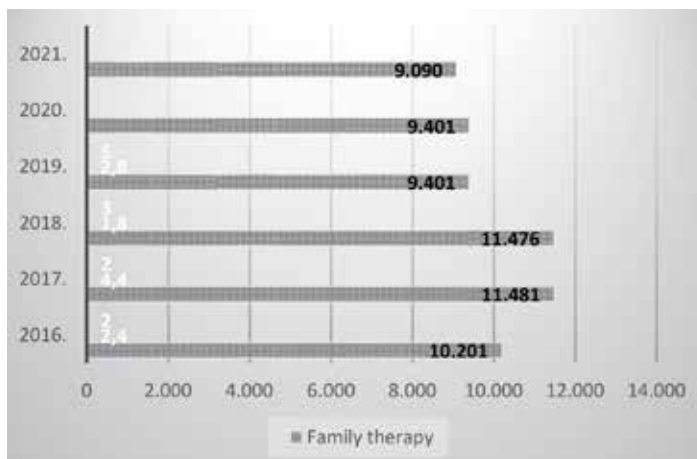
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Of the total *Psychotherapy* (194,270) in Croatia in 2016–2021, most therapies were administered in 2019 (34,690) and the fewest in 2017 (26,127) (Graph 4).

Graph 4. Activities of mental health care teams, *Psychotherapy*, Croatia 2016–2021
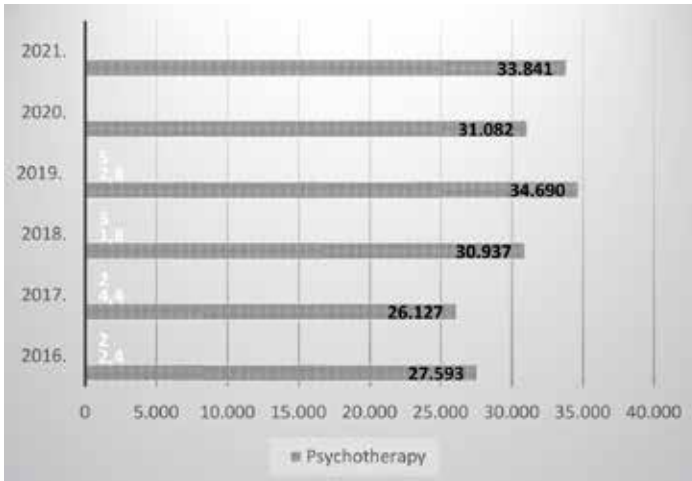
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Of the total *Group therapy* (12,463) in Croatia from 2016–2021, a significantly higher number of therapies were administered in 2019 (3,027) and the fewest in 2017 (1,399) (Graph 5).

Graph 5. Activities of mental health care teams, *Group therapy*, Croatia 2016–2021
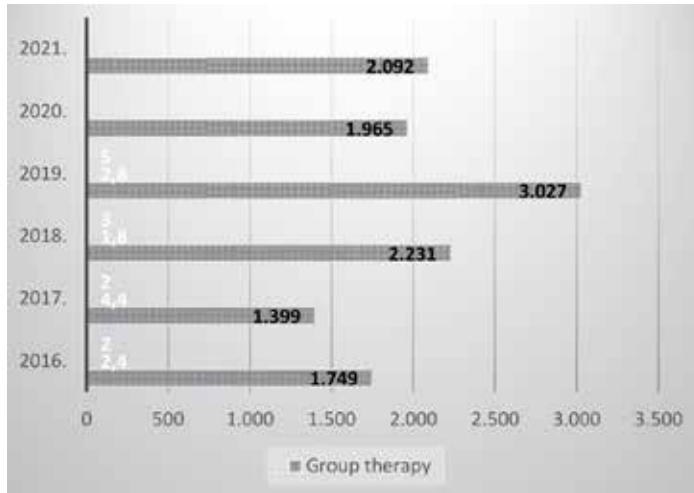
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Of the total *Interventions* (44,413) in Croatia 2016–2021, the most were administered in 2020 (13.768), with significantly less in 2017 (4,037) (Graph 6).

Graph 6. Activities of mental health care teams, *Interventions*, Croatia 2016–2021
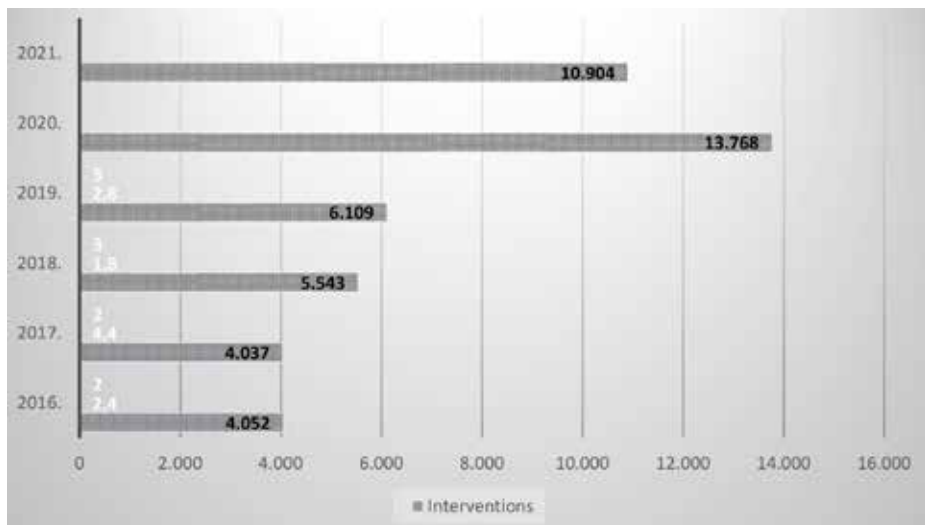
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Mental health literacy has proven to be one of the significant determinants of mental health, which can potentially improve the health of both an individual and the population (Muslić et al., 2020:324).

The research construct was first described in 1997 and included the knowledge and beliefs of an individual regarding mental health, i.e., mental disorders that help in their recognition, management or prevention (Jorm et al., 1997). Research in different countries, conducted with different methodological approaches, indicates insufficient knowledge at the level of the general population and specific age groups about mental health problems and mental disorders prevention and recognition, what forms of help are available and valuable, and how to provide first aid to people manifesting difficulties (Muslić et al., 2020:324). Of the total *Data processing and appraisal draw-up* (134,904) in Croatia 2016–2021, a significantly higher number were implemented in 2018 (29,765) and the fewest in 2016 (20,411) (Graph 7).

Graph 7. Activities of mental health care teams, *Data processing and appraisal draw-up*, Croatia 2016–2021
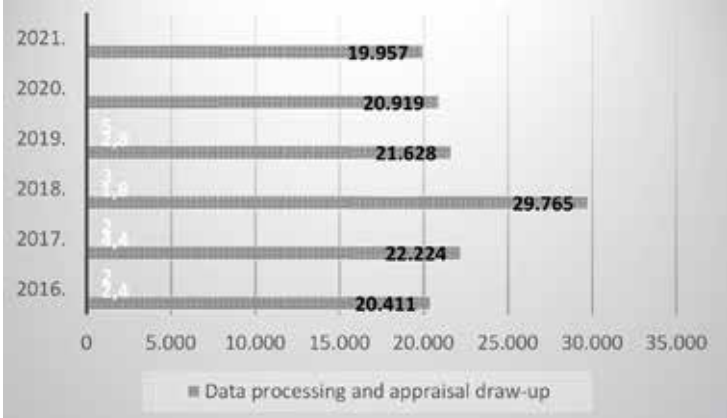
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Of the total *Preventive activities* (92,769) in Croatia 2016–2021, the most were implemented in 2021 (17,008), and the fewest in 2016 (13,010) (Graph 8).

Graph 8. Activities of mental health care teams, addiction prevention and out-patient treatment, *Preventive activities*, Croatia 2016–2021
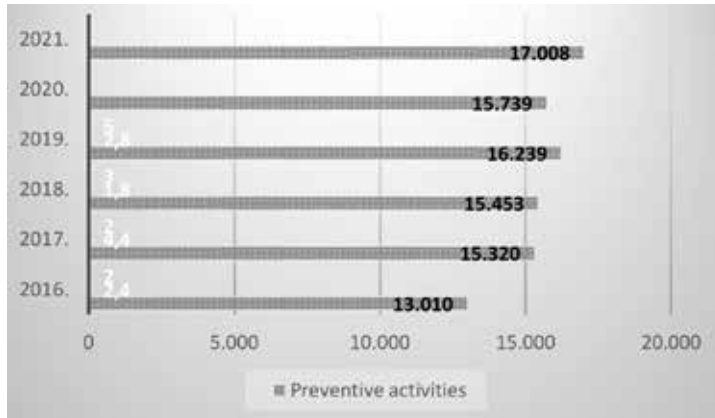
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Of the total *Media activities* (16,454) in Croatia 2016–2021, significantly more were implemented in 2020 (4,129) and significantly fewer in 2017 (2,098) (Graph 9).

Graph 9. Activities of mental health care teams, addiction prevention and out-patient treatment, *Media activities*, Croatia 2016–2021
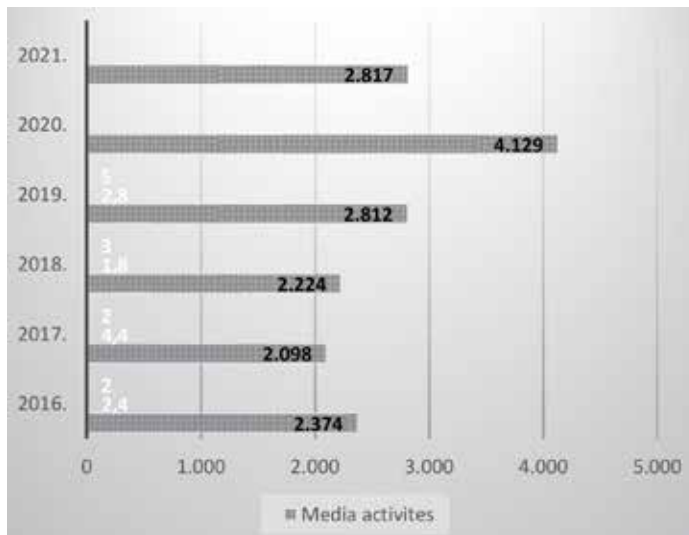
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Mental disorders are stigmatizing, cause great subjective suffering and significantly reduce the quality of life of the sufferers, as well as their environment. Their care leads to a direct economic burden on society. However, also an indirect one due to reduced productivity, sick leave and disability of those suffering from mental disorders (Silobrčić-Radić & Švigir, 2022:1). Of the total, *other activities vital for team functionality* (5,520), Croatia 2016–2021, significantly more were implemented in 2016 (1,306), with the fewest being implemented in 2018 (757) (Graph 10).

Graph 10. Activities of mental health care teams, addiction prevention and outpatient treatment, and *other activities vital for team functionality*, Croatia 2016–2021
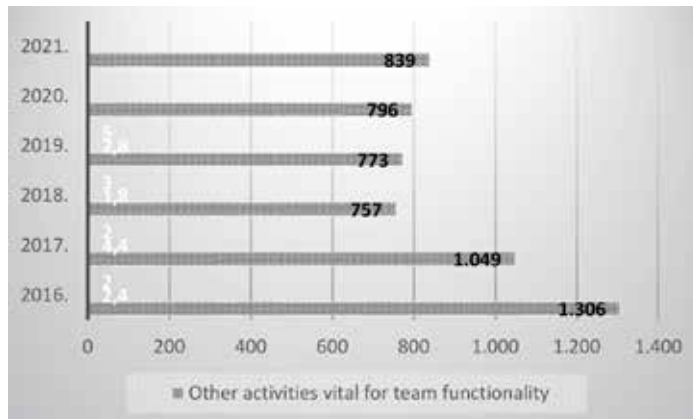
Of the total *other tasks* (67,212) in Croatia 2016–2021, the most were implemented in 2021 (14,010), and the fewest in 2016 (9,244) (Graph 11).

Graph 11. Activities of mental health care teams, addiction prevention and outpatient treatment, *Other tasks*, Croatia 2016-2021
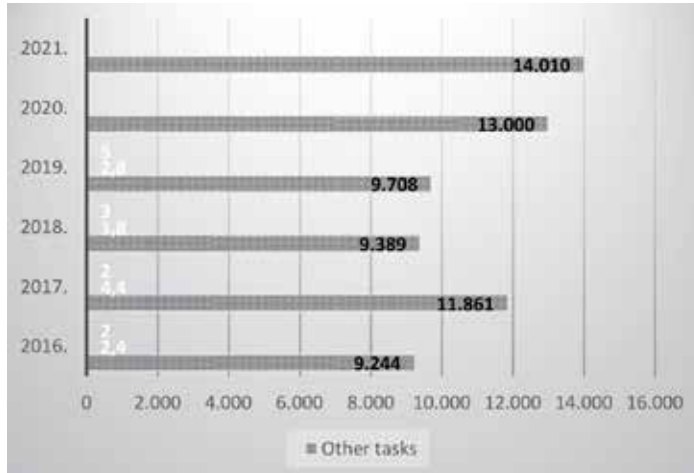
Source: by the author according to *Croatian Health Statistics Yearbook* 2016-2021

Of the total *Preventive examinations* (1,969,580) in Croatia 2016–2021, the most were implemented in 2018 (380,970), and the fewest in 2020 (271,698) (Graph 12).

Graph 12. Preventive Examinations in the Field of occupational medicine, Croatia 2016–2021
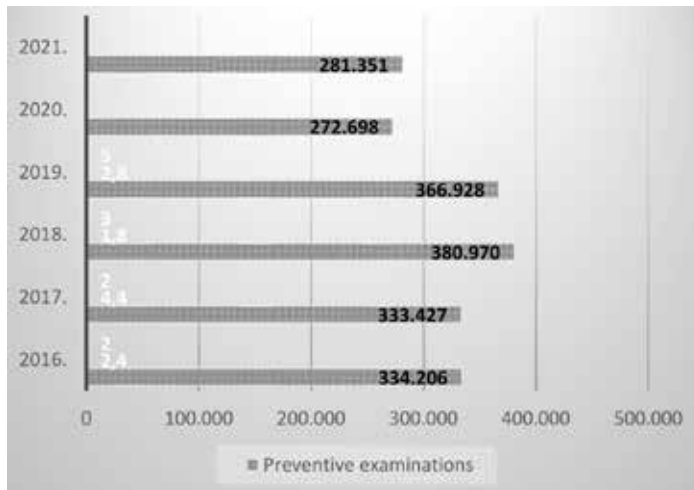
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

The need for the development and evaluation of mental health literacy programs has been emphasized over the past few years, with the primary objective being to create a foundation for good mental health, well-being, and a productive future, especially when it comes to children and young people (Bjørnsen et al., 2017:717).

"In the development of the programs and interventions, it is essential to adapt them to the target population and consider gender, age, and cultural differences as well as specific characteristics of the environment. These differences are also significant in the organization and development of the mental health system in order to make them more efficient, accessible, and culturally sensitive. Therefore, when developing a program, it is essential to identify specific goals and select content while considering science-based knowledge. The use of research methods and selection of instruments should therefore be guided by current knowledge in this area related to the specific target population and cultural environment"(Muslić et al., 2020:339).

4.2. Mortality according to selected causes list 2019–2021 – EUROPEAN SHORTLIST

According to data from the Croatian Bureau of Statistics, an increase in the number of deaths was recorded in 2021 compared to previous years (Graph 13). We also note an increase in mental and behavioral disorders in 2021 compared to previous years. Mortality indicators are crucial for assessing the population's health status, drafting health policies, evaluating national health programs, and for regional and international comparisons.

Graph 13. Mortality – Mental disorders in Croatia in the period 2016–2021
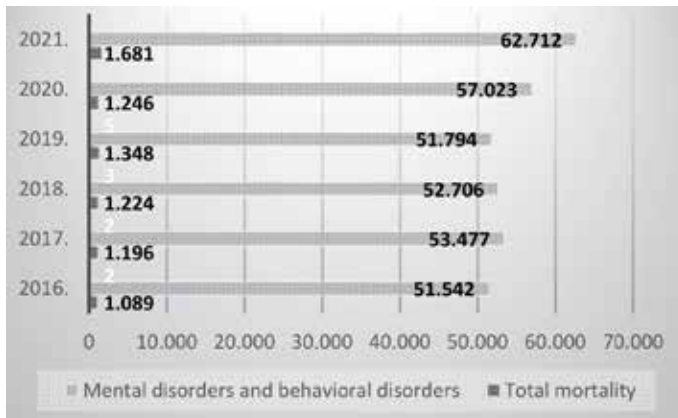
Source: by the author according to the *Mortality Report According to Selected Causes of Death*, 2016–2021

Mortality due to mental disorders, as the leading cause of death, accounts for approximately 1.5 – 2% of the total mortality in Croatia (Silobrčić-Radić & Švigir, 2022:4).

Considering the above, the severity of the problem, and the consequences that mental disorders have on society, it is necessary to take comprehensive and specific measures to promote and protect mental health and treat mental disorders. The need for a new strategic approach to mental health protection is also fuelled by several significant challenges to the mental health of the population in the modern world, such as demographic changes, especially in terms of increased representation of the elderly population and changes in the representation of mental disorders in overall morbidity. The burden of mental illness far exceeds the economic challenges. It significantly burdens caregivers, families, and the entire society (Ministry of Health, 2022:2).

4.3. Discharged patients and the number of treatment days in day hospitals in the period 2016–2021

The fundamental goals of the health policy are not only to extend life expectancy but also to improve the quality of life. In addition to further improving and developing health services, this includes promoting healthier lifestyles, reducing preventable health risks, and improving the quality of life of chronically ill and disabled people. Institutions that perform health care activities are state-owned, i.e., county-owned and privately owned health institutions. Clinical

hospital centers, clinical hospitals and state health institutes are state-owned. Counties own general and special hospitals, health centers, polyclinics, pharmacies, facilities for emergency medical assistance, home health care, and county public health institutes (Croatian Institute of Public Health, 2021:9).

Croatia's total number of beds in 2021 amounted to 22,618 (23,139 in 2020). The number of beds in all inpatient healthcare facilities per 1,000 inhabitants was 5.82 in 2021. According to the structure of beds per 1,000 inhabitants in 2021, there were 3.77 beds in acute care, 1.65 in general hospitals, and 2.28 in clinical hospital centers, clinical hospitals and clinics. There were 2.04 beds available per 1,000 inhabitants for chronic care. According to the available annual reports, 629,776 hospitalizations were recorded in the inpatient departments of Croatian hospitals in 2021 (581,093 in 2020), including hospitalizations due to childbirth, abortion and hospital rehabilitation (Croatian Institute of Public Health, 2021:199) (Graph 14).

The list of doctors employed at hospitals also includes the total number of doctors employed at other diagnostic and specialist consulting services and hospital and day hospital departments.

Graph 14. Number of beds and doctors in the period 2016–2021
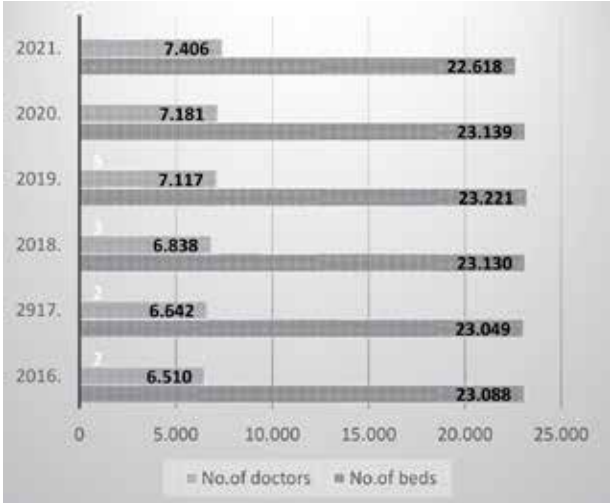
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

By comparing the annual reports for the given period, we observe that the highest number of discharged patients (Psychiatric Day Hospitals) amounted

to 37,203 in 2016, with a downward trend considering the period of the COVID-19 pandemic. A total of 518,806 hospitalizations with 1,332,637 treatment days were recorded. The highest number of hospitalization days was recorded in 2021 (311,498) (Graph 15) (Graph 16).

Graph 15. Discharged patients (Psychiatric Day Hospital) in the period 2016–2021
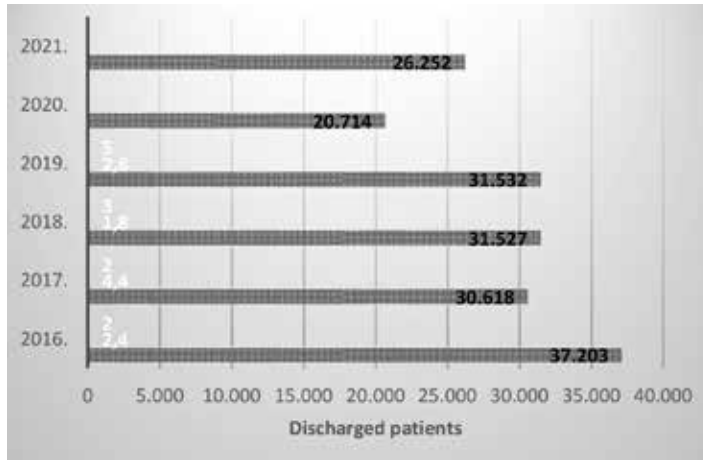
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Graph 16. Number of hospitalization treatment days (Psychiatric Day Hospital) in the period 2016–2021

Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

According to the International Classification of Diseases and Related Health Problems (ICD10) of the World Health Organization, tenth revision, 2nd Croatian edition, 2012, the group of Mental Disorders and Behavioural Disorders (codes F00-F99) includes the following subgroups:

- F00-F09   Organic, including symptomatic mental disorders
- F10-F19   Mental and behavioral disorders due to psychoactive substance use
- F20-F29   Schizophrenia, schizotypal and delusional disorders
- F30-F39   Mood [affective] disorders
- F40-F48   Neurotic, stress-related and somatoform disorders
- F50-F59   Behavioural syndromes associated with physiological disturbances and physical factors
- F60-F69   Disorders of adult personality and behavior
- F70-F79   Mental retardation
- F80-F89   Disorders of psychological development
- F90-F98   Behavioural and emotional disorders with onset usually occurring in childhood and adolescence
- F99   Unspecified mental disorder) (Silobrčić-Radić & Švigir, 2022:1)

There were significantly more discharged chronic mental patients in 2021, 235 of them with 3,014 treatment days and an average treatment duration of 12.83 days. The longest average treatment was recorded in 2019., 48.60 days for 45 patients (Graph 17).

Graph 17. Number of discharged chronic mental patients in the period 2018–2021 (Psychiatric Day Hospital) (data for 2016 and 2017 not available)
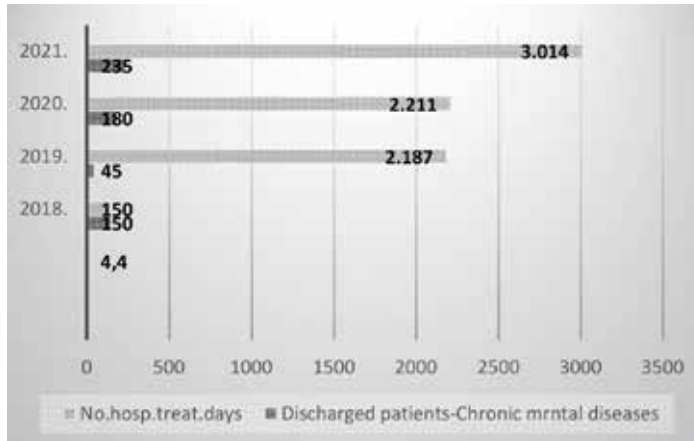
Source: by the author according to *Croatian Health Statistics Yearbook* 2018–2021

In Croatian hospitals, 6,235,190 hospitalization treatment days were realized in 2016, which amounts to an average of 8.50 treatment days per hospitalization (6,401,804 days of hospital treatment were realized in total in 2015, which amounts to an average of 8.56 treatment days per hospitalization).

In 1990, the average treatment duration amounted to 15.37 days. The average treatment duration decreased in general hospitals, inpatients and outpatient maternity hospitals from 12.3 in 1990 to 6.64 in 2016 (Croatian Institute of Public Health, 2016:211).

According to the received annual reports, 4,890,967 hospitalization treatment days were realized in Croatian hospitals in 2021, which means an average of 7.77 treatment days per hospitalization (in 2020, 4,676,614 hospitalization treatment days were realized in total, which amounts to an average of 8.05 treatment days per hospitalization) (Croatian Institute of Public Health, 2016:211) (Graph 18).

Graph 18. Average treatment duration in the period 2016–2021
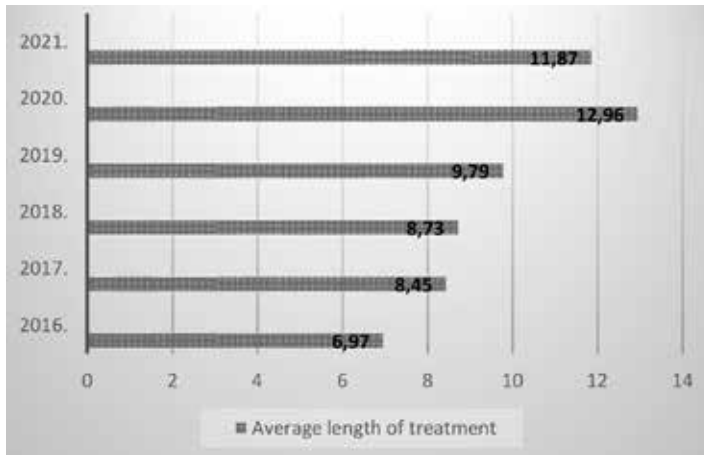
In recent years, the group of mental disorders accounts for approximately 6% of hospital morbidity in terms of the number of hospitalizations while simultaneously being the leading group regarding the number of hospitalization treatment days. From 1995 – 2020, the number and rate of hospitalizations oscillated. The overall rate and the rate for men had been increasing until 2008, after which it has been showing a downward trend, while the rate for women has been continuously increasing. In 2020, the total rate and the rates for both sexes dropped significantly. A significant drop in hospitalizations in 2020 was recorded in Croatia for all diagnostic entities, which is essentially a consequence of the impact of the COVID-19 pandemic on the use of healthcare services (Silobrčić-Radić & Švigir, 2022:26).

4.4. Preventive examinations in occupational medicine in Croatia in the period 2016–2021

Mental disorders constitute just single or multiple episodes in the lives of many citizens, and individuals can recover from these episodes when treated in a system that promotes recovery and respects human rights. Unfortunately, many will not seek help due to the stigma and lack of recognition of mental health problems. Recovery will stagnate or be impossible primarily due to the lack of preventive and treatment services in the community and exposure to prejudice and discrimination, which will cause many to be socially excluded.

That is why communities must encourage the development of services in the community and implement programs to fight against the stigma and discrimination of people with mental disorders (Štrkalj-Ivezić, 2022). In Croatia, the most preventive examinations in occupational medicine were carried out in 2018, a total of 380,970, with 8,623 cases of diagnosed illnesses or conditions in the mental health/illness (Graph 19).

Graph 19. Preventive examinations in the field of occupational medicine and illnesses and conditions diagnosed in the period 2016–2021
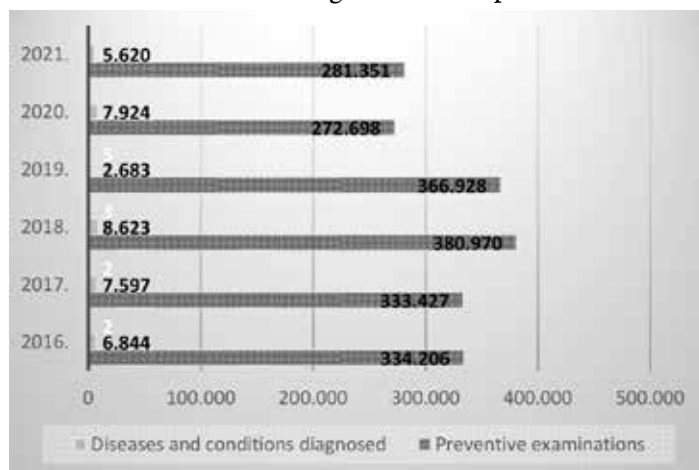
Source: by the author according to *Croatian Health Statistics Yearbook* 2016–2021

Mental health in the community is achieved through the cooperation of different sectors of society and the interconnection of services within and outside the health sector to achieve the best results for the mental health of an individual, family and society. In the area of prevention and timely recognition of mental health problems, measures include early detection of mental disorders, including screening for domestic violence, alcohol and drug abuse, depression and suicide prevention, mental health improvement, provision of psychological assistance in primary health care and better cooperation between general practitioners and mental health specialist services (Štrkalj-Ivezić, 2022).

Prevention within the framework of mental literacy of citizens and employees also contributes to disability prevention. In the Register of Persons with Disabilities (last published data, as of September 2021), there are 143,147 individuals registered as those whose causes of disability or comorbid diagnoses

contributing to the degree of functional impairment are from the group of mental impairments and 3,648 individuals whose diagnoses fall within the autism spectrum. These diagnoses represent approximately 25% of all causes of disability. Furthermore, the most common functional impairments in individuals with disabilities are mental disorders. Diagnoses that completely or significantly disable an individual are most often from the groups of organic and symptomatic mental disorders (30,470 individuals) and schizophrenia, schizotypal and delusional disorders (28,650 individuals) (Silobrčić-Radić & Švigir, 2022:4).

5. CONCLUSION

Mental health is part of every individual's general health and is the basis of strength and security for an individual, family and the entire community. An individual with good mental health is satisfied, positive, able to start a family and be happy in the family, accepts other people, can create and maintain friendships, is productive in the workplace and copes well with life's challenges. Mental health disorders are a real health challenge we approach the same way as a physical health problem. It is one of the most critical public health problems in the world and our country due to its frequent occurrence and increasing frequency, thus impairing the quality of life of a patient and his/her family. Statistics on the number of patients, the causes of incapacity to work, hospital treatment, and causes of mortality place mental disorders at the top of the list of the most common illnesses. Hospitalizations due to mental disorders have been increasing for the past 15 years. This paper suggests we should consider promoting the importance of preserving, strengthening, and improving mental health by applying healthy lifestyles and including them in educational and recreational programs. We need to work on increasing the knowledge of experts on empowering and strengthening capacities on the importance and interaction of physical and mental health through encouraging physical activity for improvement and socialization. The improvement and protection of mental health are essential for the entire social community since it improves the quality of citizens' health, contributing to personal satisfaction, social inclusion, and productivity of the overall community. Improving mental health literacy includes activities and interventions that we can implement and do implement in the community and including the following: talking about mental health to raise the level of knowledge and awareness, activities aimed at people with mental health prob-

lems and activities and interventions aimed at recovery and rehabilitation to raise quality of life. Mental health literacy of educational workers is also essential so that they can notice difficulties and changes in behavior through acquiring knowledge and skills and changes in attitudes towards professional help. This reduces the need for health care and encourages economic and social development with an emphasis on further monitoring the mental makeup of the population and research that will constitute the guidelines for further work.

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EUROPEAN UNION FUNDS IN THE SERVICE OF GROWTH AND DEVELOPMENT OF THE CROATIAN ECONOMY

Helena NIKOLIĆ, Ph.D.
University of Zagreb, Faculty of Economics and Business, Zagreb

E-mail: hnikolic@efzg.hr

Abstract

The upheaval of the Croatian economy occurred with Croatia's entry into the European Union. Financial and structural support of one of the most dominant international organizations ensured the end of the long-standing unsuccessful struggle with recession. Programs for economic development and structuring played a significant role in creating stable and sustainable growth. Structural funds were essential because they enabled the revitalization and development of entrepreneurship and crafts. Qualitative research was conducted as a focus group of five entrepreneurs who have used EU funds in the past eight years to obtain a full effect, purposefulness, and consequences of EU projects' contribution to Croatian business people and national development. Their experiences implementing EU projects were generated, and an analysis was made. The research resulted in the following conclusions: the accessibility and comprehensibility of EU projects are not entirely adequate since the local institutions and public do not inform and educate enough about the opportunities provided by the funds. In addition, the procedure within projects can be very complex, bureaucratic, and technically demanding, but with their engagement, entrepreneurs experience numerous opportunities that stimulate their growth and development.

Consequently, their success was reflected in the prosperity of the Croatian economy. The efficiency of EU projects is indisputable, as is the benefit of EU membership, based on which Croatia gained a significant economic position. The research contributed to understanding EU projects and their implementation and determining their significance for the domestic economy. However,

in future research, the intention is to investigate the development of new entrepreneurs through projects and the background of media (non)engagement in the promotion of projects and to improve the basis for research in terms of the number of respondents as well as the duration of the focus group meeting.

Keywords: *EU funds, EU projects, Croatian economy, sustainable development*

JEL Classification: *P42, P45*

1. INTRODUCTION

Economic progress and social welfare are based on the ability to increase productivity and growth. A key factor for secure well-being and successful coping with the upcoming challenges lies in innovations that require a systematic, cross-sectoral, and multi-layered approach. Also, novelties must be characterized by a significant increase in the use of new technologies that ensure greater efficiency. Implementation of innovation policy, and thus intervention in research and development, is traditionally justified by market failures (Wyrwa, 2020). Therefore, the process is complex and multidimensional and requires the design and use of a wide range of instruments that can be divided into those that facilitate the spread of innovations, favor the steps of creating and implementing new knowledge, and act as support mechanisms.

Consequently, a new global wave of disruptive innovations has emerged (Kumaraswamy et al., 2018). They cut across different scientific disciplines, technological solutions, and economic sectors, offering radically new combinations of products, processes, services, and business models. They also have the potential to open new markets around the world completely. Considering all the above, there are particular measures for innovations at the EU level (Kastrinos & Weber, 2020). Their fundamental role is to improve conditions and create a prosperous environment for development so that actors in the innovation ecosystem can freely exchange new ideas and technologies and effectively turn them into products and services that enable the EU to achieve its goals (Kuhlmann, 2001).

Guided by current needs, the EU formed a versatile and comprehensive strategy based on socioeconomic and environmental problems while maintaining the principle of subsidiarity. The goal was to create an economy with an information society that welcomes entrepreneurship, creates space for research

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and innovation, and has the capacity for integration (Granier & Renda, 2012). In the simplest terms, the priorities were innovations, entrepreneurship, synergy and competitiveness. The planned prosperity is expected in three areas: (i) *smart growth* – the development of an economy based on innovations, information and communication technologies and the initiation of young people in the context of education and easier integration into the labor market, (ii) *sustainable growth* – the promotion of a more efficient economy in terms of the use of resources in a more environmentally friendly and competitive way, (iii.) *inclusive growth* – encouraging an economy with a high level of employment which ensures social and territorial cohesion (Tomljanović, 2017). The final effect should be reflected in supporting a solid industrial base capable of facing global market competition and resulting in sustainable development. Achievement is ensured by focusing on those areas in which cooperation between member states and institutions of the European Union can contribute to the best results and the most efficient use of available financial instruments (Pasimeni & Pasimeni, 2016).

A strong focus on smart and sustainable development in operational programs paved the way for more intensive participation in strategic areas. There is an intense presence of a modern, ecologically conscious and technologically charged environment, social innovations, professional mobility, acceptance of risk as a normal part of business, and recognition and creation of economic perspectives (Häring, 2015). In Croatia, the importance of these areas is recognized as an urgent need if the development of sustainable regional communities with a significant contribution to the national economy wants to be achieved. With a robust financial and investment influence, through participation in the cohesion policy, Croatia had the opportunity to significantly change the structure of its public investments, successfully use the financial resources offered by the EU funds and, consequently, increase their effects on the country's long-term competitiveness. Large infrastructure projects, support for small and medium-sized enterprises, funds for research, development and creation of new products and services, as well as other activities that support energy efficiency and contribute to the sustainable management of regional development, have improved the economic image of Croatia and ensured its market positioning and successful combat in the market battle (Maldini, 2016). Implementing innovative investment projects has a positive effect on the development of companies.

On the other hand, companies without proactivity can very easily lead their business into big problems. Namely, in an open and variable market economy, innovation development is critical for shaping a competitive position in one's industry. In addition, it was found that, in the absence of financial support from the EU, almost half of the companies will not be able to implement innovations, and this mostly applies to small companies (Kersan-Škrabić & Banković, 2008). However, they are perceived as the driving force of every national economy and the source of enormous creative potential (Bachtrögler & Hammer, 2018). Therefore, the issue of innovations carried out in companies using EU financial support should be considered an important topic for entrepreneurship development (Sabato et al., 2015). In principle, only knowledge-based economies will be the beneficiaries of economic growth and development. Accordingly, high technologies and innovative solutions in synergy with globalization and internationalization play a dominant role in developed economies. Given that Croatia is about to enter its first decade of membership in the EU, the paper seeks to investigate the impact of European funds on the Croatian economy in the past period. Within this, the emphasis is placed on the entrepreneurs who used the funds, their view on the perspectives they provide, the efficiency of their implementation, the problems they encountered, and the adequacy of the conditions set.

2. FINANCING THROUGH EUROPEAN UNION FUNDS

Cohesion policy aims to create prerequisites for developing all European regions, especially those that lag the integration's average GDP per capita. European Union funding programs strengthen regions' social and economic cohesion and reduce inequalities (Staehr & Urke, 2022). Monetary funds are spending plans determining the EU's priorities for seven years. They include European structural and investment funds such as European Regional Development Fund, European Social Fund, Cohesion Fund, European Fund for Strategic Investments, European Agricultural Fund for Rural Development, European Maritime and Fisheries Fund, etc. (Solis-Baltodano et al., 2022). Although there is a comprehensive legislative framework (the Common Provisions Regulation), each fund has special rules. Program users can acquire grants and guarantees or receive loans (Zerbinati, 2012). Absorption is essential to the

European integration process, especially for the new EU member states antici-pating receiving significant money from the EU budget. However, the available funds are not indiscriminately available to the members. Their success depends on the "absorptive capacity", that is, the country's ability to use its capacities and resources to take funds and use them according to the project plan (Kersan Škrabić & Tijanić, 2017). The programs refer to current market issues and the macro and microenvironment situation for the economy to recover and gain resilience (Maduro et al., 2018). More than half of the cohesion policy funding is allocated to less developed European regions to reduce economic, social and territorial differences and reach the satisfactory level of development expected in the full integration (Bachtler et al., 2018).

For many years, agriculture made up the bulk of stimulus funding. In the period when Croatia joined the EU, the long-term budget was allocated to sus-tainable growth and natural resources (39%), economic, social and territorial cohesion (34%), competitiveness for growth and jobs (13%), administration (6%), global Europe (6%) and security and citizenship (2%) (McCarthy, 2018). European structural and investment funds now evoke ideas based on solid eco-nomic, market and transport infrastructure. However, culture is not excluded either. An enviable amount of money is intended to improve the cultural infra-structure. The funds deal with two specific domains of cultural policies: the first relates to cultural content and creative industries, and the second to the critical role of culture in urban regeneration, landscape attractiveness, tourism, entre-preneurship, economic development, social integration and innovation. The role of the community is particularly emphasized within the framework of activities that promote a self-aware and fully employed citizenry and the development of a democratic and sustainable society (Delgado Moreira, 2000).

In many parts of Europe, the EU has become a significant investor in eco-nomic development (Rodriguez-Pose & Dijkstra, 2021). Member states can use financial instruments to support promising local areas and business entities if they are analogous to the program's priorities. Financial instruments are suit-able for financially sustainable projects, i.e., those expected to generate sufficient income or savings to repay the support received. Ultimately, every business ven-ture should follow the direction of a smart, green, connected and social Europe that serves as a Europe of Citizens (Lianos, 2021; Moşteanu, 2020).

From 2014 to 2020, the European Union spent almost a third of its budget. Most were spent on transport and energy (58,5%), which will likely continue as a trend given the Ukrainian crisis. Investments in research and innovation (41.1%), low-carbon economy (39.6%), employment (37.3%), environmental efficiency (35.2%), vocational training (33.4%), SMEs (33.2%) and social inclusion (33.1%) are also highlighted. A minor investment was made in ICT, and the risks of climate change becriod cohesion did not focus on these areas to a significant extent in the observed period. That is, crucial sectors' development and sustainability were foregrounded. However, these two areas are the most represented in the new plan from 2021 to 2027 since the global development focus is placed on them (OECD, 2018).

3. INVESTMENT AND STRUCTURAL DEVELOPMENT OF CROATIA

The European Union contributed and helped Croatia in many sectors through its investment and structural policies. In the challenging conditions of the Croatian economy, the funds are an exceptional opportunity for accelerated income convergence with the rest of the EU member states. Croatia was forced to implement a series of bold reforms in order to create the foundations for long-term growth and development. This meant: (i.) increasing domestic production, (ii.) increasing employment, wages and pensions, (iii.) increasing exports, (iv.) reducing debt and (v.) increasing investments (Jurčić, 2015). Additionally, in order to follow the provisions of the European strategy, the Ministry of Economy of the Republic of Croatia has defined a strategic plan aimed at: (i) a competitive and efficient, knowledge-based economy adapted to the economic environment of the European Union, (ii) development of innovations, improvement of industry competitiveness, strengthening of the energy system and management of mineral raw materials, (iii) creation of prerequisites for economic growth while ensuring equal market competition for all economic entities (iv) development and standardization of trade and the internal market (Tomljanović, 2020).

The problems of ensuring sustainable development have become quite important in transforming modern economic systems into the global economic space (Sostar, 2021). Every country strives to provide support in the sphere of socioeconomic development. In this context, support for rural areas plays

a vital role because it increases the standard of living, encourages employment of the population in rural areas, and ensures appropriate levels of competitiveness in the agricultural sectors. Implementing various EU-funded projects is intended to strengthen the Croatian economy and achieve a sustainable, circular economy and practices. Entrepreneurship played and still plays an important role in economic and social development. Encouraging entrepreneurship through business zones is an excellent regional policy tool (Boldeanu & Tache, 2016). Croatia's investment and structural development are achieved through the competitiveness of the regional economy. A related measure is defining and implementing clear criteria for establishing and financing entrepreneurial zones that develop entrepreneurial infrastructure and contribute to a positive migration balance and a more favorable educational structure. Croatia has more entrepreneurial zones in the central part than the coastal area. However, through regional policy and structural and investment funds, efforts are being made to improve regions lagging in competitiveness (Horlings & Padt, 2013).

From 2014 to 2020, more than 10.7 billion euros were allocated to Croatia from structural and investment funds for regional development, cohesion policy, the development of agriculture and other sectors that will encourage youth employment. If we look closer at the distribution of funds, we can see that the dispersion is very pronounced. Significant funds were invested in the competitiveness of small and medium-sized enterprises, environmental protection and resource efficiency, research, educational and development activities in various business segments, social inclusion and vocational training, building infrastructure networks, technical assistance and information and communication technologies. Incentives for sustainable and quality employment, surviving the crisis, and effective public administration were not neglected (European Commission, 2020). Observing the implementation process and the distribution of financial resources from the European Union funds in the Republic of Croatia from 2015 to 2021, it is evident that the funds increased linearly. The special growth recorded since 2019 is visible in the Croatian economy, the increase in GDP that year and the prosperity that the Croatian economy has experienced after many years. Regardless of the emergence of the pandemic in 2020, Croatia did not record significant economic losses and continued to use the European Union's funds even more. The natural disasters of 2020 and 2021 also significantly impacted the direction of funds and reconstruction planning in many parts of Croatia (Figure 1).

Figure 1. ESIF 2014-2020: Implementation Progress (total cost) for Croatia
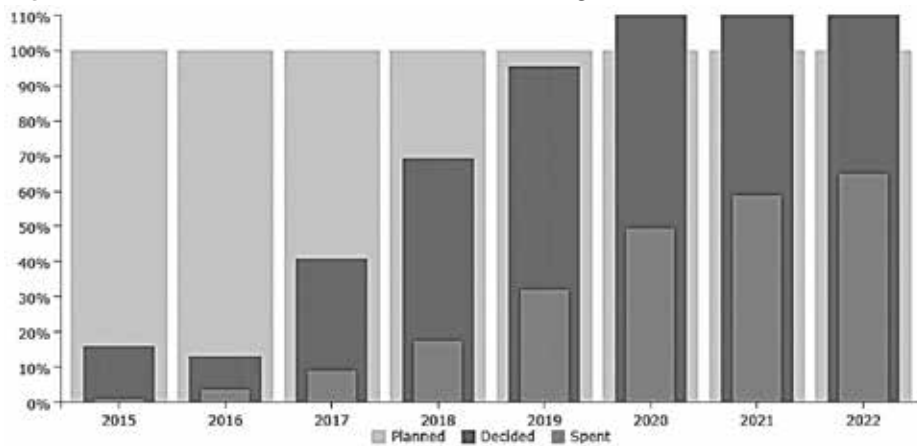
Source: European Commission, Cohesion open data platform
* Planned - Total program budget; Decided: Financial resources allocated to selected projects (portfolio of projects); Spent: expenditures reported by selected projects.

4. THE INFLUENCE OF EUROPEAN UNION FUNDS ON THE CROATIAN ECONOMY

The Croatian economy has a relatively short independent history. Until the 1990s, it had no autonomy to adopt its economic systems, and it joined European and world integrations relatively late. The economy was intended to be built on a well-designed export strategy, which in theory, was understood as a critical solution for solving pressing problems. However, poor implementation resulted in a growing commodity deficit, external debt, slow restructuring and negative macroeconomic indicators. The crisis of 2008 further disfigured the domestic economic picture. Croatia joined the European Union while a good part of the world was recovering from a recession.

On the other hand, real growth rates in Croatia were non-existent. Still, the long-term recession finally ended in 2015, and the positive outcome can undoubtedly be attributed to the effect of the EU. The recovery was driven by strong growth in foreign demand and an increase in private consumption. Growth in GDP and disposable income was established, and strong export results were supported by foreign interest in Croatian service activities and increased added value of Croatian products. The recovery of private investments was accompanied by substantial corporate deleveraging, while state investments were affected using EU funds (Table 1).

Table 1. Croatian Economic and social indicators (2012-2019)

	2012	2013	2014	2015	2016	2017	2018	2019
GDP growth (annual %)	-2.3	-0.4	-0.3	2.5	3.5	3.4	2.9	3.5
Private consumption	-2.9	-1.0	-0.7	1.2	3.3	3.6	3.5	3.6
Government consumption	-0.8	0.5	-1.9	0.6	1.7	2.0	2.9	3.3
Gross investments in fixed capital	-4.6	-1.0	-4.0	1.6	4.6	3.4	4.1	7.1
Total export (billion $)	22.34	23.47	24.95	22.97	24.58	27.69	30.82	31.59
Total export (annual % growth)	-1.5	2.5	7.4	10.3	7.0	6.9	3.7	6.8
Total import (billion $)	23.25	24.65	25.17	22.86	23.99	27.34	31.34	31.78
Total import (annual % growth)	-2.4	3.2	3.5	9.4	6.5	8.4	7.5	6.5

Source: World Bank (2020), Macroeconomics, Trade and Investment Global Practice and Poverty Global Practice, Ministry of Finance of the Republic of Croatia (2012-2019)

When considering the rise of the Croatian economy based on macroeconomic indicators, it is clear that EU support in the context of institutional delegation and financial injection is in the background. All the help and support resulted in reflection on competitiveness, long-term growth and development, increased international activity, the construction of a more sustainable system and the prosperity of the Croatian economy.

5. ANALYSIS OF EUROPEAN UNION PROJECTS IN THE REPUBLIC OF CROATIA IN THE PERIOD FROM 2013 TO 2020

5.1. Methodology

The purpose of this research is to study the extent to which Croatian entrepreneurs are familiar with European projects and the intensity of participation in some of the projects or programs of the European Union in the period from 2013 to 2022. Also, it was investigated how satisfied the respondents are with the influence and assistance of the EU and whether they think that Croatia made a good decision by joining the EU. What represented the starting doubt was the existence of satisfaction among Croatian companies with this kind of management and organization, or the attitude that Croatia would better organize projects for growth and development without the financial support that the EU contributes. Based on the researched literature, the assumed starting point, and the present doubts, three research hypotheses were defined:

- ✦ H1: *EU projects are easily accessible and understandable to entrepreneurs.*

- ✦ H2: *The EU provides numerous opportunities and encourages the growth and development of the Republic of Croatia, which is evident from the good organization and success of EU projects.*

- ✦ H3: *The Republic of Croatia is in a much better economic position since it became part of the EU.*

The conducted research is descriptive; that is, it is qualitative research. A focus group collected data on five entrepreneurs who could use EU funds in the specified period. These were three small and two medium-sized privately owned companies that operate on the domestic market but are also internationally oriented. The questions were specific and aimed at giving straightforward answers to obtain the most concise results for this sample. When collecting data, special attention was paid to consistency, validity, completeness, and objectivity. The examination was conducted twice, in June and July 2022, for 45 minutes each and consisted of 10 questions. When presenting the research results, the respondents' identity was kept secret.

The methodology included the use of the following: (i) the method of analysis through the author's formation of conclusions based on the acquired knowledge about the actualization of EU funds among Croatian companies and their rationalization and standardization; (ii) the method of induction due to the presented general conclusions about the influence of the received EU funds on Croatian economic growth and development based on individually analyzed cases, (iii) the method of deduction which defined conclusions about specific knowledge through general knowledge and collected attitudes, (iv) the method of comparison which contributed to the formation of conclusions by comparing similar knowledge possessed by the respondents which were presented through the research and (v) method of description, by which all items of interest (EU funds, EU projects, Croatian economy, sustainable development) were described.

5.2. Focus group results

All respondents believe that EU funds were initially exotic in Croatia. Faced with the recession and considerable problems in business, of which the problem with liquidity and lack of financial resources was the leading one, funds were imposed as an ideal solution. Chaotic was present everywhere – unstable rela-

tions, limited business, and fear of risk within corporations; corruption, disordered, inefficient and non-synergistic system on the domestic market; strained relations between business partners due to unfulfilled expectations and low competitiveness on a global level accompanied by the low added value of products and services and insufficient technological level of development. External help was necessary, but it was a question of the ability of Croatian companies to meet the high standards and requirements imposed by funds and programs in a bureaucratic sense. Procedures were complicated, financial resources were not easy to obtain, few succeeded, and no experts dealt with the implementation of much-needed projects. It was tough, but fortunately, the situation has visibly changed today because the domestic market has become aware of the importance of completing every single step to obtain financial resources from funds to improve business and ensure prosperity and long-term sustainable growth and development. Nowadays, entrepreneurs do not write projects themselves but engage experts – specialized agencies – who deal with the procedures and coordination with local authorities responsible for project implementation. The most popular are structural and investment funds, based on which the Croatian economy profits the most. Namely, in recent years, particular emphasis has been placed on entrepreneurship and developing small and medium-sized enterprises since they account for more than 90% of the economy. Even though the long-term recession hit entrepreneurs more than citizens and many Croatian companies went bankrupt, one interviewee pointed out that until ten years ago, receiving support and education for self-employment was unimaginable because entrepreneurship in Croatia was not understood and approved. The willingness to accept risks was not up to par, even though the business climate at the time was much needed and unfavorable, and the collapse further strengthened the non-competitiveness of Croatian companies. The salvation of the Croatian economy came precisely from membership in the EU, without whose support, revitalization would not have been possible.

For a breakthrough in business through financing from funds, an important aspect is communication. Therefore, to obtain financial resources for the execution of the project, communication must be clear at every step. It was pointed out that no one is willing to invest in a poorly explained and planned project. Entrepreneurs often make mistakes here because they think a good idea is priceless. In principle, the problem of Croatian companies has always been superficial strategies that are not adequately, professionally, and thoroughly worked out in the initial step.

To make matters worse, even those poorly defined strategies were never implemented because companies could not stick to the plan and program. Building a company on shaky foundations means you cannot expect long-term success and sustainable development. The EU and the funds have also introduced significant changes in this s, which helped Croatian companies to continue their business on the international market. Namely, optimism is welcome, but the idea does not create finances or bring support from funds or institutions. Systematicity is necessary for the project to be approved, so each component must be researched, verified, and detailed.

Building on the issue, it was pointed out that in the process of implementing projects, there is much waiting, bureaucracy, and paperwork that must be filled out and submitted accurately. A stable and systematic business ensures survival in short-term turbulent, and uncertain times. Thought when an entrepreneur is faced with many tasks and responsibilities in daily business, it is straightforward to make a mistake and/or predict the wrong direction. Therefore, the best way to implement any project is to engage people, which has often not been the practice. Croatian entrepreneurs shied away from cooperation, partnership, sharing their own business and involving third parties in business and decision-making processes. Although it is profitable to engage qualified people who coordinate the project, because it is not easy to get funds, nor is the project process a matter of formality.

Moreover, participating in the competition to obtain funds does not guarantee success. Uncertainty about the outcome of the project deepens short-term frustrations. In addition, the project requires complete dedication, and fear arises when energy, time and work must be shared simultaneously if left to themselves. Evolution in business thinking took place and significantly improved the performance of domestic companies. The importance of education as the best initial step for every entrepreneur with an affinity for financial resources from funds was also established. The projects look attractive but require a lot of effort, work, and knowledge, so it is best to stick to your domain. In this sector, professionalism is guaranteed, and expand your business.

The discussion also raised the question of the media and trust in e-institutions. The fact that the funds are not propagated so much in the media is resented, which results in a very present saga with deadlines and ignorance that the resources are available. In Croatia, much money from the funds is not used

because people do not follow tenders and deadlines or simply do not know this is even possible. It is a common opinion that funds exist only for agriculture and tourism. Of course, that is not true. For example, the European Social Fund is focused on the development of society. Socially responsible companies can create great projects but are unaware of them. Information is, therefore, crucial. It is not easy to keep up with all the current events, but it is the entrepreneur's task to inform himself or at least to have a team of people in charge of monitoring the offer of funds and the conditions set. In this regard, changes have taken place so that Croatian companies have become more agile, more ready for changes, taking the initiative and open to training.

It has been pointed out several times that funds are a very profitable way to "boost" companies and businesses. Regardless of the sector, a good project can save the company, elevate it, upgrade, and improve it. Croatia is a country with numerous potential and resources that are, for the most part, unused. If an entrepreneur can use a particular potential or resource by implementing a profound idea with the support of EU funds, then it is the best possible investment. A business that is based on work, order, and discipline, not just ideas, is a business that is undoubtedly going to pay off in the end, both for personal growth and development and for the national economy. The responsibility is significant because the EU also expects results. If outcomes are absent, the money must be returned, or sanctions will follow. The pressure is excellent, but the benefits are much greater. Every entrepreneur welcomes financial support, especially when it is an investment of several million euros, but what if it is a wrong business decision? In what way will it be justified and returned? A very difficult situation that is not desirable at all. For this reason, there is complex paperwork, processes and proving the usefulness and sustainability of the project, which Croatian companies reluctantly accept because of a higher goal – gaining experience, testing their limits and potential, their growth and development, and achieving the essential elements for successfully competing in a complex and demanding environment.

6. CONCLUSION

The point of the Union, as a community, is integration into a collective that functions efficiently and economically according to the principle of fairness. In other words, it is necessary to take care of each unit's macro and micro fac-

tors. Based on experience, thorough approach and adequate implementation of imagined strategies, the European Union has developed adequate instruments for creating the basis for growth and development, as well as successfully dealing with moments of crisis. Ultimately, those mentioned above implied sustainable development, greater competitiveness, and intensified influence at the international level. EU funds were established with the same purpose and have contributed to positive changes and intensive investment in prospective areas, guided by the principle of ensuring growth through sharing, mutual aid, and perseverance. Croatia entered the European Union in a period of endless struggle with the effects of the global economic crisis. It was membership in the Union that resulted in solving complex problems of a financial and structural nature. The help and support of the revitalization programs played a significant role in the domestic economy. For Croatia to continue to be profiled as stable and promising, European help will also be much needed in the future.

The research was qualitative on a deliberate sample of five entrepreneurs who used EU funds for their companies in the last eight years. The hypothesis that projects are easily accessible and understandable to everyone (H1) has been rejected since the media does not talk about it enough, and the public is not educated about the possibilities of EU funds and project implementation. However, the other two hypotheses (H2: The EU provides numerous opportunities and encourages the growth and development of the Republic of Croatia, which is evident from the good organization and success of EU projects and H3: The Republic of Croatia is in a much better economic position since it is part of the EU) are proved. The EU provides numerous opportunities and encourages the growth and development of the economy. However, research has shown that projects can be complex, administratively demanding, and time-consuming.

The key results from this research show that the availability and implementation of EU projects in Croatia should be exposed more in the media since entrepreneurs are generally not sufficiently well informed, and the available information is not comprehensible. In order to prevent this, it is necessary to hire more professional staff who will deal with information and marketing engagement. Another key thing is education. Entrepreneurs should constantly educate themselves on their initiative, but the European Union could also start numerous education courses for entrepreneurs, especially inexperienced ones. The third thing is organization. Entrepreneurs must have a clear idea and plan for the implementation of the project in order for it to be approved and ultimately

succeed. Good organization is the key to success, implying that all project segments are planned in advance and thoroughly analyzed.

The limitations of this research are the small sample of respondents, the limited time frame of the focus group meeting and the subjectivity of the respondents themselves. Also, their education, information and communication are questionable. That is, their expertise cannot be established with certainty. In addition, since it was a focus group, it was impossible to examine all opinions in detail and cover all research areas. Considering the presented limitations, the recommendations for further research include the following: qualitative research on this topic would be best conducted with in-depth interviews with more respondents. This way, respondents would have more space to express their opinions and experiences. Also, it would be interesting to investigate new entrepreneurs' navigation and business development through projects and delve deeper into the issue of low media interest in projects and funds within the European Union. In other words, to see how much of a role the political dimension plays and how big a gap it creates between public knowledge and the system.

The European structural and investment funds have helped Croatia increase its capacity, improve its workforce and implement innovations, new technologies and practices to expand, improve and successfully compete in the market. The funds played a significant role in encouraging the entrepreneurial climate and regional development, based on which they significantly improved the Croatian economy. European programs deal with small and medium-sized enterprises, non-governmental organizations, the environment, agriculture, and social work, putting them high on the usefulness scale. Many Croatian entrepreneurs use EU funds and programs, slowly but surely creating a more modern, technologically advanced, and competitive Croatia. Trends show that development, innovations, and research will continue to be carried out with a focus on implementation in entrepreneurship, which shows good indicators for continued successful growth.

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INFLUENCE OF INCENTIVE COMPENSATION ON EMPLOYEE TURNOVER IN A MILITARY ORGANIZATION

Slobodan ČURČIJA
Croatian Defense Academy, Zagreb

E-mail: slocurcija@gmail.com

Davor ĆUTIĆ, Ph.D.
Croatian Defense Academy, Zagreb

E-mail: davorcutic@gmail.com

Abstract

Previous research on civilian employees' compensation has offered evidence of its influence on the effectiveness of human resources from employee turnover. Studying this topic on the population of military employees also seems exciting and challenging to consider. The reason for this lies primarily in decreasing interest in military professions, more job offers on the labor market, and the separation of the military system from researching the members of military structures.

In light of the above, this paper examines the impact of incentive compensation on employee turnover within the Republic of Croatia military organization. The empirical research was conducted on a sample of 120 employees of a military organization in order to analyze the impact of the subject. With this in mind, the influence of incentive compensation on employee turnover is observed through two groups of independent variables. The first cohort of independent variables refers to the transactional aspects of compensation, for instance, life insurance benefits, additional health insurance benefits, traveling allowances, etc. The second independent variable group includes relational award elements, such as advancement opportunities, development and training possibilities, work-life balance, workplace culture, etc. The research results showed that besides traditional relational elements, factors such as the mentally

stimulating nature of work, supportive supervisors, and thorough performance reviews also affect employee turnover. Regarding transactional aspects of compensation, the most impactful are often Christmas and holiday allowances, long service awards, and tax advantages.

This research paper also examines reasons for high employee attrition from civilian organizations.

1. INTRODUCTION

The design of a compensation system that fully supports the organizational strategic plans and activities is necessary to develop competitive advantages in the global economy. In this sense, compensation management ensures the recognition of employees' contributions to the organization's success through strategies, policies, and processes involving financial and non-financial incentives. This method is tailored to meet the organization's and its constituents' requirements. As a result, a general objective of fair, equitable, and consistent compensation is established. Furthermore, one of the most effective ways to motivate and retain employees is to reward high performance adequately. Compensation management is essential to human resource management, indicating its importance (Pattrick & Mazhar, 2019).

Military organizations should be no exception when applying and utilizing incentive compensation, which simultaneously supports human resource management policies in the defense sector and contributes to the national security strategy (Asch, 2019). The role of compensation systems is significant for attracting, retaining, and motivating the highest quality talent, desperately needed for the long-term viability of military forces. Similarly, its report from the 2020 Department of Defense (2020) highlights the compensation of US military members as one of the most sizable components of its budget.

This paper examines the influence of incentive compensation on reducing employee turnover in the military organization. Following the research subject, the primary hypothesis has also been derived that this paper intends to prove and reads as follows: The incentive compensation model impacts the reduction

of employee turnover. In consideration of the influence of incentive compensation on employee turnover in civilian organizations, the authors of this article use the research of renowned foreign and local experts like Armstrong and Brown (2006), Galetić (2020), and specialized organizations such as SHRM, WorldatWork and CIPD. Furthermore, for observation purposes of the influence of incentive compensation on employee turnover in the military organization, papers by the authors Asch (2019), Kapp and Torreon (2020), Marone (2020), Switzer (2020) were used, and organizations like RAND, Congressional Research Service, US Department of Defense, Office of the Under Secretary for Defense of Personnel and Readiness et al. Besides, due to the availability of data, the authors of this paper also use examples of incentive compensation for employees from military organizations in the USA and Canada. An integral part of this article is also quantitative research conducted in the Republic of Croatia on the population of employees of the military organization, i.e., officers who perform the duties of teachers in the military education system, as well as of students of the officer's levels of education. The fact that no research has been conducted in the Republic of Croatia on the influence of the incentive compensation model on the reduction of employee turnover in military organizations has also justified the implementation of such research. In addition, after analyzing the available data, a considerable difference in the established compensation programs between the military personnel of the USA, Canada and the Republic of Croatia could be seen.

2. INCENTIVE COMPENSATION SYSTEMS - SUPPORT FOR THE ACHIEVEMENT OF ORGANIZATIONAL GOALS

Organizations are formed and exist to carry out a specific mission. To do so, they must attract and employ people with the necessary knowledge, skills, attitudes, and abilities. Attracting and retaining such people requires appropriate rewards. Therefore, organizations develop and implement a reward system to direct employees' attention to specific behaviors required to achieve desired results. These behaviors range from regular attendance to meeting specific standards, i.e., employee contribution through innovations that increase productivity. Rewards must meet specific employee requirements to be effective in stimulating desired behaviors. However, designing an appropriate reward system is ex-

ceptionally demanding because employees differ in knowledge, skills, and competencies and their performance in various organizational and lifestyle roles. Thus, the organization's reward system will include everything the employee deems valuable and desirable and all the employers can offer in exchange for the labor (Naidu & Satyanarayana, 2018).

A broader classification of incentive plans distinguishes between financial and non-financial rewards. Financial rewards are typically a combination of base salary, contingent pay, and benefits, encompassing all financial rewards an employee receives for their performance. Direct financial compensation in the form of a base salary represents a stable source of income, providing security to employees. In contrast, indirect financial compensation, such as various benefits, will significantly impact the sense of belonging to the organization (Klindžić & Galetić, 2020). Interestingly, Kato and Kauhanen (2018) cite contingent pay as a direct financial reward and a primary tool for incentivizing economic behavior, subsequently leading to improved business performance. On the other hand, indirect financial rewards can be defined as types of incentive compensation that are not directly correlated with job performance and typically include PTO (paid time off), health benefits, and retirement plans (Figure 1).

Figure 1. Financial rewards
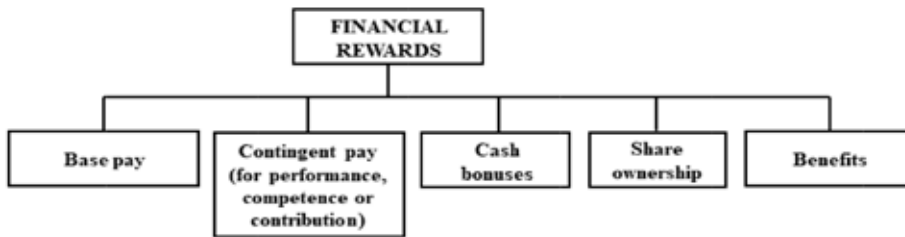
Source: the authors according to Klindžić & Galetić, 2020

Another essential element of the compensation system pertains to non-financial rewards, primarily focused on meeting employees' needs for various forms of recognition within the organization, including larger responsibility, more autonomy, personal development, and work-life balance. Additionally, these rewards can be extrinsic, such as recognition, or intrinsic, arising from the nature of the work itself, and for over fifty years, behavioral scientists have described this compensation element as critical for enhancing job performance for over fifty years (Galetić, 2020). Furthermore, employers and employees can

perceive non-financial rewards as impactful. For instance, as a tool, employers establish and nurture stronger connections with their workforce with minimal capital investment. Most non-financial rewards, e.g., skill development programs, enhance productivity and lead to increased profits. At the same time, employees who engage in such initiatives often have higher chances for career advancement and for creating conditions that pave the way for promotions or bonuses (Bester, 2022) (Figure 2).

Figure 2. Non-financial rewards
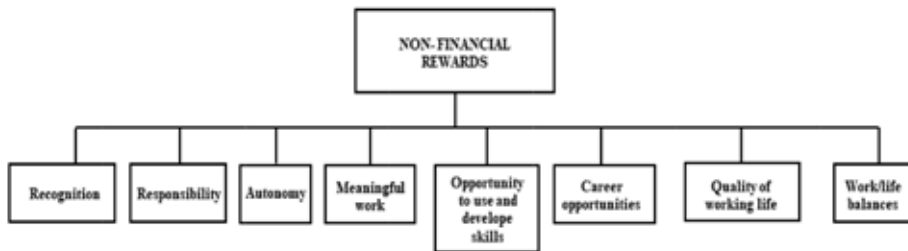
Source: the authors according to Galetić, 2020

When retaining employees with specialized skills and remaining competitive in volatile markets, most modern organizations find that developing the concept of total reward is the solution. A total reward is an approach to reward management that emphasizes the importance of considering all aspects of the employment relationship that are important to employees, not just pay and benefits (Cotton, 2022). Furthermore, it seeks to integrate the reward's financial and non-financial aspects into a cohesive whole. In addition, the total reward approach recognizes the realization of the right to the monetary aspect of the reward (pay and benefits). Besides, it also recognizes the significance of providing employees with work-related rewards and opportunities to advance their skills and careers. Interestingly, Armstrong and Brown's (2006) comprehensive rewards model encompasses transactional (base salary, performance-related pay, and benefits) and relational rewards (learning and development, recognition and status, mentally stimulating work, job security, and work environment) (Figure 3).

Figure 3. Armstrong & Brown's total reward model

Transactional Rewards	Base Pay	Total Remuneration	Total Rewards
	Pay for Performance		
	Employee Benefits		
Relational Rewards	Training and Development	Non-Financial/Intrinsic Rewards	
	Recognition		
	Challenging Job		
	Job Security		
	Work Environment		

Source: the authors according to Armstrong & Brown, 2006

The Towers Perrin Total Reward Model divides rewards into four quadrants in a matrix, with the upper two representing direct and the lower two representing indirect rewards. Direct or transactional rewards refer to compensation and benefits, while indirect or relational rewards, which further support direct ones, touch on learning and development and the work environment. The model can also be viewed from an individual and collective perspective and divided into the left and right sides of the matrix (Armstrong & Taylor, 2014) (Figure 4).

Figure 4. The Towers Perrin Total Reward Model

Source: the authors, according to Armstrong & Taylor, 2014: 366

The Nienaber Total Reward Model (Hole & Hotz, 2016) is based on integrating the previously depicted models and many of their respective reward categories (Figure 5).

Figure 5. The Nienaber Total Reward Model

Source: the authors, according to Hoole & Hotz, 2016

3. REWARD PRACTICE IN A MILITARY ORGANIZATION

The purpose of establishing a compensation system within a military organization is derived from its contribution toward the end goal of attracting and retaining personnel. An adequate compensation system has the purpose of helping achieve three different human resource management goals, which include the following (Asch, 2019):

- The compensation policies should be designed following human capital programs in order to ensure appropriate work and advancement incentives for military personnel

- The compensation structure should establish a solid groundwork for effective employee review systems which recognize and motivate top-performing individuals and enable the retention and advancement of deserving military personnel based on their contributions while simultaneously also propelling underperforming employees to depart from the military organization

- the objective of the military compensation systems is to inspire military personnel to remain in service long enough for all the extensive investments made in their training, development, and active-duty operations,

to be wholly remunerated. At the most opportune time for the military organization, human resource management and compensation systems must incentivize military personnel to transition out of active service.

The military staff compensation models are based on a set of principles that encompass effectiveness and efficiency during both war and peacetime, clarity, equality, and adaptability to technological advancements, tactical changes, supply and demand dynamics, and alternations of the operational environment (Office of the Under Secretary of Defense for Personnel and Readiness, 2018).

The compensation systems for military personnel can also be observed from a "sentimental" standpoint, considering they are frequently a benchmark for a country's appreciation towards its military and, therefore, often reflect its willingness to protect its borders and the interests of its citizens. In addition, military compensation represents the most significant component of a country's defense budget, e.g., pay and other benefits expenses represent one-third of the US defense budget. Policymakers repeatedly express concern that these costs might negatively impact the identified requirements for the modernization of the armed forces (Office of the Under Secretary of Defense (Comptroller), Chief Financial Officer, 2017a).

Investigating military reward systems reveals that several competent ministries of defense do not disclose publicly the methods used to compensate military employees. The US Department of Defense is one of the exceptions, displaying the military organization's reward system in various reports and specialized web portals. It should be noted that this highly comprehensive and elaborate system incorporates financial, non-financial, and deferred compensation elements. Furthermore, it should be emphasized that compensation varies based on rank, years of service, geographic location, and dependent family member status (Kapp & Torreon, 2020).

An analysis of the fiscal 2019 US budget for its military personnel indicates that base pay comprised 45.5% of the budget, housing allowances accounted for 15.6%, retirement costs constituted 12.8%, meal allowances made up 5.3%, healthcare costs for military retirees accounted for 4.9%, expenses related to permanent change of station and other personnel costs represented 4.6%, salary supplements accounted for 4.1%, and miscellaneous expenses accounted for the remainder (Asch, 2019).

Basic pay, allowances paid for military personnel's housing and food, other types of allowances, pay supplements, bonuses, and tax advantages comprise the essential elements of the cash reward package. On the other hand, basic noncash benefits involve health care, severance pay for involuntary separation from service, and education benefits. It is worth noting here that the health care program, for example, covers active-duty members of the armed forces, retirees, members of the National Guard and Reserves, family members, as well as others such as some former military spouses, family members of the deceased members of the military, as well as the medal of honor recipients. Furthermore, deferred compensation for US military employees includes a savings plan, pensions for veterans, military retiree health care, veterans' health benefits, and other deferred benefits (Department of Defense, 2023). A savings plan represents a distinct investment combination involving contributions from employees and employers, serving as a supplement to the retirement benefits of military personnel (Department of Defense, 2020). Figure 6 illustrates the primary compensation components for active-duty members in the US military.

Figure 6. Major Compensation Elements Provided to All Active-Duty Personnel

Name of compensation element	Description
Basic pay	Provided to all service members. Rate of payment varies based on rank and years of service.
Basic allowance for housing (BAH)	Service members based in the United States and not provided with government housing receive BAH. Rates vary based on service member's rank, location, and whether or not the service member has dependents.
Basic allowance for subsistence (BAS)	All service members receive BAS except in limited circumstances when they are required to eat government-provided meals (e.g., enlisted personnel in basic training). The BAS rate varies based on officer or enlisted status; enlisted receive higher BAS than do officers.
Medical and dental care	All service members and their family members are eligible for medical care under the TRICARE system. This system provides free medical and dental care to the service member, and free or low-cost medical and dental care to the service member's dependents.
Annual leave	All service members are entitled to 30 days of annual leave per year (includes leave taken on weekends, holidays, or other regular days off). Typically, a maximum of 60 days may be accrued, although under certain circumstances up to 120 days may be accrued. Leave in excess of the allowable limit is forfeited at the end of the fiscal year.
Life insurance	Service members' Group Life Insurance (SGLI) is available to all service members, though they may opt to not purchase it. Provides up to $400,000 in life insurance coverage and $100,000 traumatic injury coverage for the service member; up to $100,000 in coverage for spouse is also available.
Commissary	Subsidized grocery stores on military bases around the world. The Defense Commissary Agency estimates average savings of about 26% compared to commercial stores, though the savings would be less if compared only to discount chains.
Exchange	Retail stores (furniture, electronics, clothing, jewelry, etc.) on military bases around the world. They do not receive direct subsidies like commissaries, but do receive some indirect subsidies in the form of waived or reduced costs for utilities, rent, and base services.

Source: the authors according to Kaap & Torreon, 2020

The fundamental principle of establishing the military pay system involves comparing salaries with civilian counterparts for equivalent positions. However,

experts in the field have observed that comparing compensation between military and civilian organizations is not always a straightforward and "like-for-like" comparison (Asch, 2019). Namely, the nature of work performed in military and civilian organizations differ significantly, with military personnel often carrying out activities in life-threatening conditions. In contrast, relocations of military staff to various domestic and international locations are considered integral parts of their professional careers. Additionally, active-duty military personnel are at the disposal of their employers 24 hours a day, seven days a week, excluding approved vacation time which can, for whatever, be interrupted or terminated if necessary. On the other hand, a career in the military does offer intangible rewards, such as the opportunity and satisfaction of serving one's country, while at the same time also gaining valuable training and skills which do qualify an individual for careers outside of the military as well.

Making comparisons between the civilian and military compensation programs can be very challenging due to differences in some key constituent elements. For instance, the military compensation system encompasses a range of non-financial and significant deferred benefits (e.g., military pensions), which account for around 50% of total compensation versus 33% of the total within civilian organizations. For military service to be appealing from a compensation point of view, especially when it comes to attracting volunteers and potential new hires and retaining individuals with broadly sought education/skills, the incentive compensation needs to be closely comparable to the composition and benefit levels offered by civilian businesses (Asch, 2019).

4. EMPLOYEE TURNOVER

Employee turnover can be defined as the situation when the human capital quits voluntarily (e.g., resignation, retirement, etc.), which can further be divided into functional (desertion of the low-performing workforce) and dysfunctional (departure of high-performing individuals) or is asked to leave the company (involuntarily), and ideally quickly replaced by a qualified new employee. Therefore, employee turnover has a negative effect on the organizations but at the same time, and especially when including more specific data (e.g., % of total metric driven by over-hiring), it is typically a solid indicator of the effectiveness of human resource policies within a particular consortium. By attempting to understand better the motivating factors behind employee turnover, policymak-

ers and employers should be able to launch more successful retention initiatives aimed at reducing turnover rates and improving general stability and profitability within an organization/entity (Maxwell, 2021). On a national level, the normalization of turnover levels can influence the stability of economic sectors, so governments have closely monitored the metric. For instance, the European Commission incorporates employee turnover magnitudes in its annual employment report on employment trends (EC, 2022).

Human resources experts often talk about the early warning signs pointing to the possibility of employee departure (Tyler, 2021). Correspondingly, key indicators can include:

- important life changes
- lack of upward mobility
- specific teams characterized by above-average turnover rates
- reduced communication efforts
- more frequent absences

Moreover, an industry report analyzing employee engagement and retention metrics indicates that more favorable benefits and higher compensation levels are most often (in 36% of instances) the primary motivation for opportunistic job changes in 36% of instances. This is followed by better work-life balance (in 25% of cases), greater recognition (16%), a more favorable working environment (8%), closer alignment of values between an organization and prospective employee (5%), and a few other reasons, including flexibility when it comes to paid time off (Maurer, 2021).

Another significant factor contributing to employees leaving a company is a negative rapport with an immediate supervisor, leading to decreased work engagement.

Another report examining topics of work culture and compensation cites that voluntary attrition is often caused by several deficiencies within organizations, including the combination of (Jansen, 2022):

- The lack of compensation transparency, e.g., if an employer fails to explain its compensation structure and progression clearly, employees may get a sense that they are unfairly compensated
- flexibility/work-life balance, e.g., due to the inability to coordinate effectively and affordable with daily work/career demands, 50% of men and

46% of women surveyed are contemplating the prospect of permanently quitting their jobs

- insufficient organizational commitment towards diversity, equality, and inclusion (e.g., the research shows that certain groups, such as women and members of the LGBT population, are more prone to experiencing discrimination, exclusion, and various other workplace obstacles during their careers), (Maxwell, 2021)

- the absence of employer focus on employee wellbeing, including mental health prioritization

Over the last few years, the COVID-19 pandemic has been a pronounced cause of disruption to the traditional work environment. Initially, it resulted in many organizations carrying out headcount reduction programs to cut costs amidst tight liquidity conditions, so job security took precedence over work flexibility and compensation among employees (Hailey & Jacobs, 2022). On the other hand, after a period of uncertainty, and due to governments injecting money into national economies, the pandemic ended with illogical historically low unemployment rates and talent scarcity across most professions. The conditions gave rise to favorable conditions for employees, which could demand as flexible as ever working conditions (e.g., "work from home" as a permanent solution) and higher compensation levels. The circumstances have reversed to a notable degree over the last quarter of 2022 and into 2023, as the world is bracing for the potential recessionary or mildly recessionary environment in the second half of 2023.

In all industries, employee turnover has been identified as having a negative effect on organizational effectiveness (Čurčija, 2022). As a result, turnover increases the workload and demands on the remaining employees, which can lead to frustration, physical and mental breakdown, and additional effort on the part of the workers. Due to turnover, the organization incurs substantial financial expenses related to candidate acquisition, selection, education and training, salaries, and severance pay.

Interestingly, employee turnover is undoubtedly present within military organizations worldwide as well. The research examining causes for dissatisfaction and staff attrition in the Canadian armed forces (CAF) lists several potential triggers (Yeung et al., 2019: 141):

- The effects of military life on the spouse/partner, as well as on children

- dissatisfaction due to the absence of stimulating, meaningful, and engaging work, frequent reassignments to various geographic locations
- discontent with military specialty occupations and/or assigned duties
- dissatisfaction with compensation
- displeasure with career management and/or frequent schedules for new reassignments
- lack of fairness and equality in the workplace

Upon analyzing the findings of the studies mentioned above, it becomes evident that the key reasons for military personnel departing the service exhibit a high degree of consistency across each study. These reasons can be categorized into three primary groups:

- assignment-related factors, encompassing the location of the assignment, the qualitative nature of work, and upward mobility prospects
- workload, which typically refers to the volume of assigned work and the corresponding level of burden
- the caliber of higher-level supervisors, e.g., their leadership qualities and transparency (Beriault, 2021)

4.1. Turnover among the military personnel of the US Armed Forces

The research on predicting turnover among military personnel across all central organizational units of the US Armed Forces sought to uncover the reasons behind attrition during the initial 36 months of service. One of the findings revealed that the estimated costs in 2019, stemming from early departures of military staff (e.g., recruitment costs, training expenses, salaries, and benefits), totaled $258 million in the Navy and $562 million in the US Army (Marrone, 2020). The results also indicate that about 60% of departures from or continuations of military service can be foreseen by observing the individual characteristic of staff at the time of enlistment in the armed forces. Moreover, the study reveals that the relationship between specific characteristics may change over time but remains consistent across different organizational units. By analyzing various demographic data, reports show that attrition rates are more pronounced in the Army compared to the Navy and Marine Corps components of the military. In addition, the findings derived through analysis of

employment/service contracts reveal that these contract characteristics can be a significant source for predicting turnover. Correspondingly, it is essential to consider the specificities of different contracts, e.g., the Air Force has only a few military occupational specialty aspects represented in their service contracts (Marrone, 2020).

While the US Air Force has been facing a significant employee turnover, the same negative effect has been present with the US Army, especially regarding the younger officer population (Switzer, 2020). Even though, unlike the Air Force pilots who possess technical skills that are very much in demand by the airline industry, the Army personnel typically lacks such tangible competencies that are directly transferable to other organizations, with developed leadership and management abilities, they are still highly sought after by many employers outside of military-related industries. Confronted with inadequate human resource management policies (e.g., inadequate compensation) and often more enticing civilian opportunities, younger military officers were leaving in large numbers. The scarcity of junior officers raised concerns about the selection quality for promotion among this group of military personnel (Switzer, 2020). Furthermore, it is essential to mention that the US armed forces have faced an inability to predict precisely enough attrition of military pilots. For instance, after completing ten years of service, it is challenging to foresee which pilots will leave the Air Force upon being reassigned to a new duty station.

Consequently, the inability to anticipate the departure of pilots creates considerable instability within the air force. A study conducted in 2019 identified five primary factors that influenced 1936 active pilots to leave the service (Switzer, 2020). These elements encompass the following:

+ difficulty in maintaining a work-life balance
+ inability to choose service location
+ ancillary work responsibilities and tasks
+ the abundance of available civilian job opportunities
+ total compensation and benefits

Moreover, the US Navy has also been confronted with employee turnover and its effects. A study conducted on a sample of 25 prospective officers revealed that about 70% are in some phase of preparation for transitioning to careers in the civilian sector. The same study also highlights that these officers are often experiencing fatigue due to extended periods away from home, chal-

lenging and fast-paced work environments, and perceived loss of autonomy in command among officers at the colonel level. Other elements that could potentially influence the decision of Navy personnel to leave active service mainly revolve around the reduced quality of life, lengthy deployments, and uncertainty related to deployment schedules (Snodgrass, 2014).

5. EMPIRICAL RESEARCH ON THE IMPACT OF THE INCENTIVE COMPENSATION MODEL ON THE REDUCTION OF EMPLOYEE TURNOVER IN A MILITARY ORGANIZATION

5.1. Research methods

The development of the research instruments is presented through a structured questionnaire. Notably, the questionnaire was designed to gather opinions on statements related to a broader study of the impact incentive-based compensation systems and military education may have on the effectiveness of human resources management in a military organization. It consists of 91 questions, out of which 27 directly pertain to the research subject of this study (eight questions cover general and demographic information, while the other nineteen include statements about the influence of incentive-based reward models on reducing employee turnover in the military organization). Most of the questions regarding the impact of incentive-based compensation on employee turnover were formulated by the authors or adopted from other sources, e.g., the research by the authors Scott and McMullen (2012), as well as internal materials from organizations such as the Chartered Institute for Personnel Development and the Society for Human Resource Management.

In this study, the independent variable pertains to incentive-based compensation, while the dependent variable is employee turnover. Accordingly, the study examined the impact of incentive-based compensation on employee turnover by considering two independent variables. The first group of independent variables focused on those commonly mentioned in the literature, such as transactional aspects of compensation, including benefits like life insurance, health insurance, supplementary, commute allowances, etc. In addition, other independent variables were incorporated, e.g., Christmas bonuses, annual bonuses based on years

of service, and tax incentives. A total of 9 different variables were analyzed. The second cohort of independent variables pertained to relational aspects of compensation, such as advancement opportunities, development and growth prospects, teamwork and collaboration, required level of professionalism, qualitative performance evaluation, stimulating nature of work, supervisor support, etc. A total of 10 independent variables describing the impact of relational rewards on employee turnover were observed, and the participants were asked to express their thinking on a Likert scale. Their responses were coded using numbers from 1 to 5, with 1 representing the code for the lowest and 5 for the highest modality of intensity.

A thorough analysis of the eligible population of military personnel revealed that officer-related data would carry significant importance due to their diverse managerial roles within the organization. Considering their managerial responsibilities, officers at different levels actively structure employee rewards. Accordingly, the empirical research encompassed a population of instructors within the military education system and participants from officer training programs, and the research sample comprised 120 officers. The study was conducted at the Croatian Defense Academy "Dr. Franjo Tuđman" in Zagreb, during the first quarter of 2020, with the approval of the Assistant Secretary of Defense of the Republic of Croatia, responsible for human resource management.

To begin with, the availability of instructors and officer training program participants was determined, along with their respective group sizes. Subsequently, a timeline for conducting the survey was established, and a meticulous selection of research locations and schedules was completed, considering the enhanced COVID-19-related protocols. The survey was administered in person by the surveyor to each group of respondents. After receiving 120 questionnaires, the data collection phase was concluded, and the data were subjected to statistical analysis using SPSS. Statistical methods such as descriptive analysis, t-test, factor analysis, cluster analysis, and logistic regression were also utilized in this research.

This empirical research is based on a model that explores the relationship between incentive-based compensation (independent variable) and employee turnover reduction (dependent variable) in a military organization. Figure 7 illustrates the model, which examines the impact of incentive-based rewards, including relational and transactional aspects, on reducing and mitigating attri-

tion in the military. The preparation of the initial model drew upon materials from authors Asch (2019), Kaap and Torreon (2020), as well as the US Department of Defense (2023).

Figure 7. Initial Model of Incentive Compensation in the Function of Reducing Employee Turnover in a Military Organization
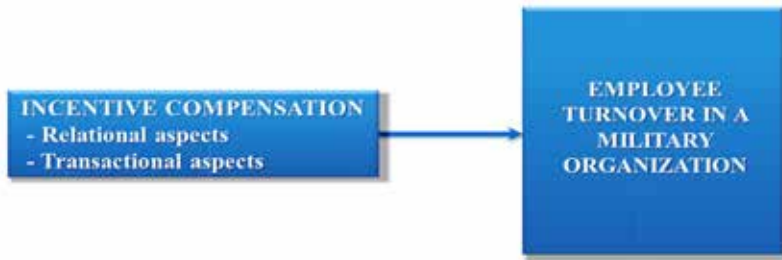
Source: the authors

5.2. Data Analysis and empirical research results

The results of quantitative research are presented in three sections. First, descriptive statistics were used to describe respondents' general and demographic information. The sample was then used to conclude the population using the t-test, one of the methods of inferential statistics. For this purpose, a test of the proportion of officers who responded from a unique population was conducted. The hypothesis was finally tested using factor analysis, cluster analysis, and the logit regression method.

The first section of the research results consists of general and demographic data, such as gender, age structure, level of professional education, the personal rank of the respondent, time spent in personal rank, length of service in the military organization, position held by the respondent, and time spent in the current post. In this paper, only the respondents' gender and level of professional education will be presented.

Figure 8. Gender distribution
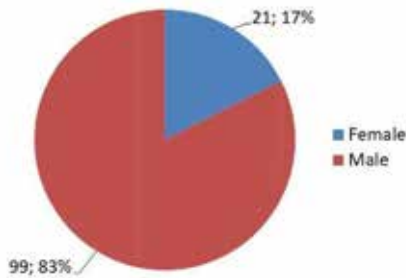
The image in question represents a research sample of 120 respondents, including 21 females (17%) and 99 males (83%).

Figure 9. Professional education level
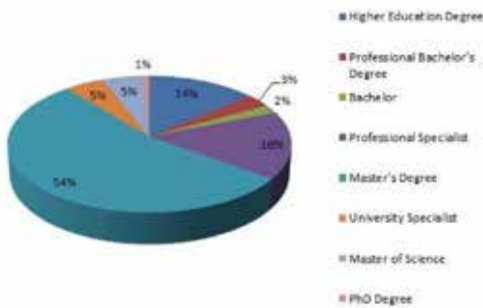
Figure 9 shows that more than half of respondents hold master's degrees (54%), compared to 16% of professional specialists. It is worth noting that 14% of respondents hold a higher education degree, with an equal number of university specialists and Master of Science (5% each).

According to Table 1, the statements concerning the impact of indirect rewards on reducing employee turnover have the highest percentage of agreement among the unique population of officers.

Table 1. Test results for the proportion of respondents in a special officer population - variables B1–B19.

Statement	m	$\hat{p} = m/n$	p_0	$1 - p_0$	Standard error	
B1	53	0.441667	0.38	0.62	0.033088	1.863734
B2	47	0.391667	0.33	0.67	0.032053	1.923877
B3	58	0.483333	0.42	0.58	0.033645	1.882413
B4	40	0.333333	0.28	0.72	0.030607	1.742507
B5	39	0.325	0.27	0.73	0.030264	1.817358
B6	37	0.308333	0.25	0.75	0.029517	1.976229
B7	34	0.283333	0.23	0.77	0.028687	1.859134
B8	34	0.283333	0.23	0.77	0.028687	1.859134
B9	40	0.333333	0.28	0.72	0.030607	1.742507
B10	68	0.566667	0.51	0.49	0.034077	1.662898
B11	97	0.808333	0.75	0.25	0.029517	1.976229
B12	83	0.691667	0.63	0.37	0.032912	1.873702
B13	83	0.691667	0.63	0.37	0.032912	1.873702
B14	85	0.708333	0.65	0.35	0.032514	1.794102
B15	82	0.683333	0.62	0.38	0.033088	1.914105
B16	88	0.733333	0.68	0.32	0.031799	1.677221
B17	63	0.525	0.46	0.54	0.033975	1.913193
B18	57	0.475	0.41	0.59	0.033527	1.938727
B19	90	0.75	0.69	0.31	0.031527	1.903124

Source: the authors

Statements B11 – *a sense of pride and belonging affects your staying in a military organization* (more than 75% of the unique population), B19 – *teamwork and cooperation with other employees affects your staying in a military organization* (more than 69% of the unique population), and B16 – *a challenging job affects your staying in the military organization* (more than 68% of the unique population). B14 – *the opportunity for advancement affects your staying in the military organization* (more than 65% of the unique population), B12 – *working conditions affect your staying in the military organization* (more than 63% of the unique population), B13 – *the required level of professionalism influences your staying in the military organization* (more than 63% of the unique population), and B15 – *the opportunities for advanced training and development influences your staying in the military organization* (more than 62% of the unique population). Statements B17 – *there is a balance between work in the military and the organiza-*

tion of private life (more than 46%) and B18 – *the support you receive from your superiors affects your staying in the military organization* (more than 41%) have a lower percentage of agreement of respondents from the unique population. The analysis of the findings for this auxiliary hypothesis reveals that the unique population of employees has a much lower proportion of agreement with the statements regarding the influence of direct rewards and benefits on the reduction of employee turnover. The results for statements B1 – *the amount of your pay is set relatively compared to other employees* (more than 38%), B2 – *there is a match between your pay and the work invested* (more than 33%), B9 – *Christmas and holiday bonuses affect your staying in a military organization* (more than 28%), and B4 – *long-service awards affect your staying in a military organization* (more than 28%), as well as B5 – *the amount of severance pay for retirement affects your staying in a military organization* (more than 27%), confirm those mentioned above. Furthermore, it is essential to note that the unique population of employees has a lower percentage of agreement with the following statements: B6 – *life insurance benefits affect your staying in the military organization* (more than 25%); B7 – *supplemental health insurance benefits affect your staying in the military organization,* and B8 – *compensation for transportation insurance affects your staying in the military organization* (more than 23%).

A comprehensive analysis of the results obtained from factor analysis identified variables with significant factor loadings, indicating their influence on reducing employee attrition. Variables with high factor loadings on factor 1 – *non-financial rewards affect the retention of employees in the military organization,* and factor 3 - *financial rewards and benefits impact the retention of employees in the military organization,* as shown in Table 2.

Table 2. Variables with high factor loadings on Factor 1 and Factor 3

FACTOR 1 - Non-financial rewards affect the retention of employees in the military organization (MO)		
B3/30	The recognition and rewards you receive for your work affect your staying in the military organization	0.56379
B13/40	The recognition and rewards you receive for your work affect your staying in the military organization	0.60945
B14/41	The required level of professionalism affects your staying in the MO	0.71742
B15/42	The opportunities for development and advanced training affect your staying in the MO	0.62351
B16/43	Challenging work affects your staying in the MO	0.73348
B18/45	The support you receive from your superiors affects your staying in the MO	0.55917
B19/46	Teamwork and cooperation with other employees affect your staying in the MO	0.68186

FACTOR 3 - Financial rewards and benefits influence the retention of employees in the military organization		
B6/33	Life insurance benefits affect your staying in the MO	0.74033
B7/34	The benefits of supplementary health insurance affect your staying in the MO	0.84621
B8/35	The transportation insurance allowance affects your staying in the MO	0.75678
B9/36	Christmas and holiday bonuses affect your staying in the military organization	0.81836

Source: the authors

Analyzing the factor analysis results, it is also possible to conclude that financial and non-financial rewards and benefits impact employee retention in a military organization. The subject analysis results show a high positive correlation between factor 1 – *non-financial rewards influence employee retention in the military organization* and variables that express attitudes about the impact of the incentive reward model on reducing employee turnover. Variables such as challenging work (0.73348) and opportunities for advancement (0.71742) are particularly prominent among them. On the other hand, the impact of financial rewards and benefits on employee retention is evident by the existence of a high positive correlation between factor 3 – *financial rewards and benefits affect employee retention in a military organization* – and variables that express attitudes regarding the influence of the incentive model rewards for reducing employee turnover. Among these variables are supplemental health insurance benefits (0.84621), Christmas and holiday bonuses (0.81836), transportation insurance benefits (0.75678), and life insurance benefits (0.74033).

When the impact of the incentive reward model on reducing employee turnover is examined, it is evident that respondents in the second and third clusters are most influenced by factor 3 – *financial rewards and benefits affect employee retention in the military organization*. In addition to the preceding, members of the fourth cluster are most influenced by factor 1 – *non-monetary rewards affect employee retention in the military organization*. Cluster 2 characteristics are shown in Table 3, Cluster 3 in Table 4, and Cluster 4 in Table 5, with a description below the tables.

Table 3. Cluster 2 characteristics

Variables	Arithmetic mean	Standard deviation	Variance
Factor 1	0.12772	0.59917	0.35901
Factor 2	0.62488	0.67460	0.45508
Factor 3	0.73169	0.60431	0.36519
Factor 4	-0.04100	0.83770	0.70174
Factor 5	0.14667	0.98554	0.97130

Source: the authors

The second cluster involves 44 respondents (36.67%). Ten women and 34 men are among the officers in the second cluster. They are 44.65 years old on average. A master's degree is the most common level of professional education (in 59.09% of cases), and their officer rank is usually lieutenant colonel (29.55%) or first lieutenant (27.27%).

Factor 3 – *motivation by financial rewards and benefits affects the staying in the military organization*, which includes questions B6 – B8 (*life insurance benefits affect your staying in the military organization, supplementary health insurance benefits affect your staying in the military organization, and compensation for transportation insurance affects your staying in the military organization*) and B9 – *Christmas and holiday bonuses*, have the most significant impact on the respondents of the second cluster.

Table 4. Cluster 3 characteristics

Variables	Arithmetic mean	Standard deviation	Variance
Factor 1	-1.11426	1.54285	2.38039
Factor 2	-1.30596	1.07031	1.14556
Factor 3	0.58505	0.86031	0.74013
Factor 4	0.24908	1.14892	1.32002
Factor 5	-0.38812	0.88222	0.77831

Source: the authors

Members of cluster 3 are, on average, 50 years old (37.5%), with a master's degree being the most common (56.25%). The majority of respondents (75%) agree or strongly agree with statements B6 – B9 (*life insurance benefits affect your staying in the military organization, supplementary health insurance benefits affect your staying in the military organization, and transportation insurance benefits affect your staying in the military organization*) and B9 – *Christmas and holiday bonuses affect your staying in the military organization.*

Cluster 4 characteristics are shown in Table 5.

Table 5. Cluster 4 characteristics

Variables	Arithmetic mean	Standard deviation	Variance
Factor 1	0.69969	0.61169	0.37417
Factor 2	-0.14975	0.77062	0.59385
Factor 3	-0.68939	0.83664	0.69996
Factor 4	0.62231	0.58794	0.34567
Factor 5	-0.32512	0.96499	0.93121

Source: the authors

The fourth cluster has 34 respondents (28.33%). There are five women and 29 men, with an average age of 47.35 years. A master's degree (44.12%) is the most common level of professional education. Members of this cluster are most affected by factor 1 – *non-monetary rewards affect employee retention in the military organization*, which includes variables B3 and B4 (*recognition and rewards you receive for your work affect your staying in the military organization*), B13–B16 (*the required level of professionalism affects your staying in the MO; the opportunities for advancement affects your staying in the MO; the opportunities for development and improvement affects your staying in the MO; challenging work affects your staying in the MO*), and B18–B19 (*support that you receive from your superiors affects your staying in the MO; teamwork and cooperation with other employees affect your staying in the MO*). Members of the fourth cluster agree or strongly agree with the statements in these variables. All percentages of agreement are very high, and the statements with which the majority of respondents agree or agree are as follows:

- B16 – *challenging work affects your staying in the military organization* (97.06%)
- B14 – *the opportunities for advancement affect your staying in the military organization* (91.18%)

The logit regression method was also used to verify the hypothesis mentioned above. A logit regression was calculated for each variable pC_i, i=1,2,…,20 in which one of the variables B_i, i=1,2….,19 was an independent variable (statements that the incentive reward model affects to reduce employee turnover). A total of 380 equations were calculated, and the results are listed in 19 tables only for those equations where the independent variable was significant at a

5% significance level. The expected increase in the probability ratio P(Y=1) to P(Y=0) for a unit increase in the independent variable was calculated for each regression. The results of the logistic regression method indicate a notable impact of transactional rewards (e.g., service anniversary awards, retirement severance payments, traveling allowances, life and health insurance benefits, annual performance bonuses, etc.) on decreasing employee turnover. At the same time, it was also observed that relational awards (e.g., teamwork and collaboration, supervisor support, learning and advancement opportunities, required level of professionalism, working conditions, stimulating work assignments, etc.) have a meaningful effect on mitigating employee turnover.

6. DISCUSSION AND CONCLUSION

6.1. Discussion

A detailed incentive compensation model for military organization employees was developed after the research and the results. The study's findings made it possible to determine unequivocally which elements of incentive compensation should be used to reduce military employee turnover. Figure 10 illustrates the elaborated incentive compensation model.

Figure 10. Model of incentive compensation designed to reduce employee turnover in a military organization
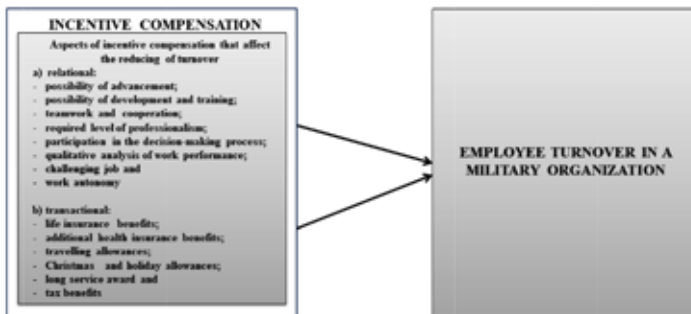
Source: the authors

This incentive reward model is intended to emphasize the impact of intrinsic and extrinsic aspects of compensation on employee turnover reduction in a military organization. Building upon this, it is essential to highlight the significance of intrinsic rewards in decreasing employee turnover within a military organization. These include engaging and stimulating work responsibilities, opportunities for career progression, effective teamwork and collaboration with other military staff, development and growth prospects, the required level of professionalism, involvement in decision-making processes, work autonomy, and thorough performance evaluation. Furthermore, through its extrinsic components, incentive compensation helps to reduce military employee turnover. This includes supplementary health insurance benefits, Christmas and holiday bonuses, traveling allowances, and life insurance benefits. The impact of financial compensation components in reducing employee attrition is also manifested through service anniversary awards and tax incentives. Consequently, the obtained results have confirmed the proposed hypothesis.

6.2. Conclusion

The empirical research conducted on a sample of military personnel unveiled several intriguing findings. Firstly, developing an incentive compensation model is one of the possible solutions for mitigating employee turnover in civilian and military settings. In this process, the motivating nature of the compensation model should not be overlooked, as it aims to reduce attrition within the military organization. Such a model integrates individual compensation elements into a functional whole/cohesive framework. This entails designing a compensation system for military personnel that recognizes both components of overall compensation, transaction (with benefits) and relations. Namely, relying on just one of the abovementioned aspects is no longer adequate, and it is essential to emphasize that employee turnover can be effectively reduced only through a combined approach to incentive compensation. This is of utmost importance for the military organization as implementing relation rewards elements, such as teamwork and collaboration, the required level of professionalism, career advancement and continuous learning opportunities, should reduce the number of personnel seeking to leave. When stimulating work assignments, involvement in decision-making processes and thorough performance evaluation are included, real conditions are created for decreasing turnover among military staff. Secondly, increasing the proportion of transactional compensation elements also

reduces employee turnover within a military organization. This includes traditional aspects such as life and supplemental health insurance and bonuses in the form of holidays (e.g., Christmas), annual bonuses, and service anniversary awards. It is worth noting that tax incentives are highlighted by military personnel as a form of financial reward that contributes to reducing attrition.

Interestingly, the theoretical research reveals the reasons for employee turnover within a military organization to remain the same. These reasons can be categorized into three major categories: frequent deployments to different duties, heavy workload, and incompetent leadership (Beriault, 2021). In addition, military staff, especially the officer population, encounter less flexible human resource management policies and the abundant presence of more lucrative civilian employment opportunities, which discourages them from extending their active service contracts. Consequently, the military organization faces the challenge of recruiting new personnel. At the same time, civilian organizations are also not immune to the challenges posed by employee turnover.

It is widely acknowledged that voluntary attrition has disruptive effects on organizational efficiency across all industry and economic sectors. Correspondingly, employee turnover amplifies the workload for the remaining staff, which can result in frustration, physical and mental exhaustion, and additional strain on workers. In addition, employee turnover entails substantial financial costs for organizations, manifested in expenses related to candidate acquisition, selection, education and training, salaries, and severance pay (Čurčija, 2022). This is also applicable to a military organization, evidenced by the findings indicating that, in 2019, due to unexpected military personnel turnover, the US armed forces totaled $820 million in costs (recruitment, training, salaries, and benefits), $258 million within the Navy and $562 million in the Army branch (Marrone, 2020). Consequently, these effects hamper the execution of planned missions and negatively impact combat readiness, especially among the more junior officers serving as unit commanders at lower levels and operational commanders in the Navy and Air Force. The shortage of junior officers raises concerns about future promotion selection within this group of military personnel, eventually leading up to a smaller population of highly qualified candidates set to take over the highest military ranks (Switzer, 2020).

The relatively small sample size can be labeled as the limitation of this study. Therefore, future research on human resources management in military organi-

zations would benefit from a larger sample of participants, and it should include not only officers but also other military personnel, such as soldiers and non-commissioned officers, who constitute the backbone of every military organization. Additionally, future studies should include the highest levels of military leadership to ensure a comprehensive understanding. This management level is directly involved in human resource management processes within the military organization. It should, therefore, be interested in designing a compensation system that aims to reduce military employee turnover.

Furthermore, a potential limitation of empirical research is that certain statements within the research instrument rely on subjective opinions provided by the participants, particularly when assessing the impact of specific aspects of incentive compensation on reducing military personnel turnover. However, due to the absence of prior studies in the Republic of Croatia focusing on decreasing military staff turnover through incentive compensation models, there is a lack of experiential data that could enhance objectivity in the design and implementation of empirical research. Finally, this study creates room for further research, and it would be intriguing to compare actual data on employee turnover with an analysis of the factors contributing to their decision to leave the military organization.

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COMPARING THE FEATURES AND CAPABILITIES OF ARCORE, ARKIT, AND VUFORIA: AN ANALYSIS OF THEIR POTENTIAL FOR CREATING AUGMENTED REALITY EXPERIENCES

Damir TOMIĆ
Josip Juraj Strossmayer University of Osijek,
Faculty of Education

E-mail: tomic.damir.dj@gmail.com

Vjekoslav GALZINA
Josip Juraj Strossmayer University of Osijek,
Faculty of Education

E-mail: vgalzina@foozos.hr

Abstract

Augmented reality (AR) is a rapidly growing field with many applications, from entertainment and gaming to education, industry, and medicine. Several platforms are available for building AR experiences, including ARCore, ARKit, and Vuforia. In this article, we compare the features and capabilities of these three platforms in order to evaluate their potential for creating AR experiences. We analyze the supported devices and operating systems, the tools and frameworks provided for development, the quality and accuracy of the AR experiences created with each platform, and the pricing and licensing options. Our analysis shows that while all three platforms offer a range of features and capabilities for building AR experiences, they differ in terms of the specific devices and operating systems they support and their specific features and capabilities.

Keywords: AR, ARCode, ARKit, Vuforia, augmented reality

JEL Classification: O3

1. INTRODUCTION

Augmented reality (AR) is a technology that enhances the real world with digital information, allowing users to interact with virtual objects in the physical environment (Azuma, 1997). It can potentially revolutionize various fields, including entertainment, education, medicine, and more.

AR combines real-world imagery with computer-generated graphics and data (Carmigniani & Furht, 2011). Users can view the enhanced content through various devices, including smartphones, tablets, and specialized AR headsets. These devices use sensors, such as cameras and GPS, to track the user's location and orientation and to recognize objects and surfaces in the environment. The AR software then uses this information to overlay digital content on the user's real-world view.

AR has a wide range of applications. In entertainment, it has been used in games like Pokémon Go, which overlays virtual creatures on the player's surroundings. In education, AR can create interactive learning experiences (Wang et al., (2018), allowing students to visualize and manipulate complex concepts more engagingly. AR can assist with training, diagnosis, and even surgery in medicine. For example, AR can display medical images, such as CT scans, on a patient's body, allowing doctors to see inside the patient's body without making an incision.

One of the earliest and most famous examples of AR is the Pokémon Go game, which uses a smartphone's GPS and camera to overlay virtual creatures on the user's surroundings. Other examples include AR in museum exhibits, where visitors can use tablets to view additional information about the artifacts on display, or in the manufacturing industry, where AR can assist with assembly and maintenance tasks.

The concept of augmented reality (AR) has been around for decades. However, it was not until the advent of smartphones and other mobile devices with advanced cameras, sensors, and processors that AR began to gain widespread attention. Here is a brief history of AR:

The 1960s: The term "augmented reality" was coined by computer scientist Ivan Sutherland in his seminal paper "The Ultimate Display" (Sutherland, 1965), in which he described a system that would allow users to interact with virtual objects in a natural environment.

The 1970s-1980s: AR research and development continued to advance, with notable milestones including the development of the first head-mounted display (HMD) for AR by Steve Mann in the 1970s (Mann, 1998), and the first AR application for mobile devices, the Virtual Fixture, developed by Louis Rosenberg in the 1980s (Rosenberg, 1992).

The 1990s: AR began to gain more widespread attention with the development of AR systems for the military, such as the Virtual Cockpit, which was developed for the U.S. Air Force in the 1990s (Milgram et al. (1995).

The late 2000s: AR began to gain more mainstream attention with the release of AR games and applications for smartphones, such as Layar, an AR browser released in 2009 (Layar, n.d.), and Pokémon Go, an AR game released in 2016 that became a global phenomenon (Niantic, Inc., n.d.).

The 2010s: AR continued to grow in popularity, with the release of ARKit by Apple in 2017 (Apple, n.d.) and ARCore by Google in 2018 (Google, n.d.), which made it easier for developers to create AR applications for iOS and Android devices, respectively.

The 2020s: AR has continued to evolve, with the development of AR glasses and other wearable AR devices, as well as the increasing use of AR in various industries, such as retail, education, and medicine.

2. LITERATURE REVIEW

The literature review on augmented reality (AR) will be presented in Table 1., including papers discussing the state-of-the-art use in medical education and training, manufacturing, military training, physical rehabilitation, tangible user interfaces, education, entertainment, and design, as well as the technical challenges and future directions of AR research. The review aims to examine AR's current knowledge and understanding, highlighting its various applications and the challenges and opportunities involved in its development and use.

Table 1. Augmented reality - Literature review

Authors	Paper and summary
Perifanou, Economides & Nikou, 2023	The study "Teachers' Views on Integrating Augmented Reality in Education: Needs, Opportunities, Challenges and Recommendations" explores teachers' views on integrating augmented reality (AR) in education through a questionnaire answered by 93 educators worldwide. The main requirement for effective teaching with AR is a set of digital skills that can support student-centered pedagogies in an appropriate infrastructure. The main benefits and opportunities were interactive teaching and learning, increased interest and engagement, and a better understanding of complex concepts. Barriers reported include the lack of AR educational applications, the cost of buying and maintaining AR equipment and resources, the lack of teachers' and students' digital skills, classroom management issues, and security and ethical issues. The study highlights the need to raise teachers' awareness of AR's added value in education and teachers' continuous professional development. Implications and future research recommendations on integrating AR in education are discussed.
Zabihi Kolaei, Hedayati, Khanzadi, & Ghodrati Amiri, 2022	"Challenges and opportunities of augmented reality during the construction phase" is a paper that analyzes 50 articles to assess the applications, implementation, and acceptance and non-acceptance factors of augmented reality (AR) technology in the construction phase of Architecture, Engineering, and Construction (AEC) projects. The results show that while AR has potential benefits, it is not yet fully mature, and there are conflicts in the research that require further study. The review provides suggestions for future research to address challenges and gaps in the field.
Mystakidis, Christopoulos & Pellas, 2022	The paper "A systematic mapping review of augmented reality applications to Support STEM Learning in higher education" is a systematic mapping review of the use of augmented reality (AR) in higher education to support the learning of science, technology, engineering, and mathematics (STEM) subjects. The review analyzed 45 articles published in international peer-reviewed journals from 2010 to 2020. The review found a lack of research across the STEM spectrum, particularly in technology and mathematics, and a scarcity of location-based and markerless AR applications.
Ong, Siew & Nee, 2023	The paper "Augmented Reality in Maintenance: A Review of the State-of-the-Art and Future Challenges "reviews the state-of-the-art use of augmented reality (AR) in maintenance. The authors examine the various applications of AR in maintenance, including inspection, repair, and maintenance training. They also discuss AR's current challenges and future potential in this field. The authors summarize the current research in AR in maintenance and outline future directions for research and development.
Tang et al., 2020	The paper "Augmented Reality in medical education: a systematic review " presents a systematic review of augmented reality (AR) use in medical education and training. The authors conducted a literature search to identify relevant studies and analyzed their findings to determine the effectiveness of AR in medical education. They found that AR can be an effective tool for medical education and training, improving knowledge retention and performance in various tasks such as anatomy learning and surgical simulation. However, the authors also note that more research is needed to fully understand AR's potential in medical education and identify best practices for its use.
Frigo, da Silva & Barbosa, 2016	Paper "Augmented reality in aerospace manufacturing: A review "reviews augmented reality (AR) use in manufacturing. The authors discuss the various applications of AR in manufacturing, including training, maintenance, and assembly tasks, and the benefits and challenges of using AR in these contexts. The authors also discuss the technical aspects of AR in manufacturing, such as tracking and display technologies, and highlight future research directions.

Authors	Paper and summary
Boud et al., 1999	In the paper "Virtual Reality and augmented reality as a training tool for assembly tasks.", the authors discuss the use of virtual reality (VR) and augmented reality (AR) as training tools for assembly tasks. The authors present a study examining the effectiveness of these technologies in improving task performance compared to traditional training methods. The study results are discussed, and the authors suggest that VR and AR have the potential as training tools in industrial and manufacturing settings.
Lu, Shpitalni & Gadh, 1999	The paper "Virtual and augmented reality technologies for product realization " discusses using virtual and augmented reality technologies for product design and development. The authors examine these technologies' potential benefits and challenges and explore their use in the product realization process.
Edge, 2008	In the paper "Tangible user interfaces for peripheral interaction ", the author provides an overview of the tangible user interface (TUI), which allows users to interact with computers through physical objects. The authors discuss the history and principles of TUI, as well as the technical challenges and opportunities involved in developing TUI systems.
Raajan et al., 2014	In the paper "A Review on Augmented Reality Technologies ", the authors review augmented reality (AR) technologies, systems, and applications. The authors discuss the history and principles of AR, as well as the technical challenges and opportunities involved in developing AR systems. They also review the various applications of AR in different domains, such as education, entertainment, and industry, and discuss the future directions of AR research.
Avila-Garzon et al., 2021	In the paper "Augmented Reality in Education: An Overview of Twenty-Five Years of Research", the authors review the use of augmented reality (AR) in education. They discuss the various applications of AR in education, such as language learning, science education, and training, and the benefits and challenges of using AR in these contexts. The authors also discuss the technical aspects of AR in education, such as tracking and display technologies, and highlight future research directions.
Billinghurst & Kato, 2002	In the paper "Collaborative augmented reality ", the authors provide an overview of state of the art in augmented reality (AR). AR technology allows users to see and interact with virtual objects and information in the real world. The authors discuss the history of AR, its applications, and the technical challenges involved in developing AR systems.
Rios & Paredes-Velasco, M. (2021).	In the paper "Using augmented reality in programming learning: a systematic mapping study, " the authors conduct a systematic mapping study to identify and analyze the research on using augmented reality (AR) in education. The authors found that AR has been used in a wide range of educational contexts, including language learning, science education, and training, and has been shown to affect learning outcomes positively. However, the authors also note that more research is needed to fully understand AR's potential in education and identify best practices for its use.
Azuma, 1997	In the paper "A Survey of augmented reality", the author surveys augmented reality (AR). This technology allows users to see and interact with virtual objects and information in the real world. The author discusses the history of AR, its applications, and the technical challenges involved in developing AR systems. The author also discusses the potential benefits and limitations of AR, as well as future research directions.

Source: Survey results by authors

Based on articles (Table 1.), augmented reality (AR) technology has many applications and is used in various fields such as education, manufacturing,

military training, and physical rehabilitation. The articles discuss the potential benefits of AR in these contexts, such as improved knowledge retention and performance, increased efficiency and productivity, and enhanced training and rehabilitation outcomes.

The articles also mention some technical challenges and considerations involved in the development and use of AR systems, such as tracking and display technologies, and highlight the need for further research to fully understand AR's potential and identify best practices for its use.

In addition to its practical applications, AR raises some ethical considerations, such as privacy, transparency, and control issues. It is essential to consider these issues carefully to ensure that AR's benefits are realized while minimizing any potential risks or negative impacts.

News articles can be a valuable source of information for a scientific review because they can provide a general overview of a topic, including its current state and potential future developments. News articles can also highlight key issues and challenges surrounding a topic and provide examples of its use in practice. However, it is essential to critically evaluate the credibility and reliability of news articles, as they may not always present well-researched and accurate information.

The literature from news articles reviews on the potential of augmented reality (AR) technology to transform various industries and professions will be presented in Table 2., based on five articles discussing the use of AR in fields such as gaming, education, medicine, and retail. The table will examine the potential benefits of AR and the challenges and ethical considerations surrounding its use. It will also consider the importance of carefully considering the risks and benefits of AR and addressing any ethical concerns that may arise.

Table 2. Augmented reality - Literature review (news articles)

Publisher	Paper and summary
TechRadar, 2018	"Augmented Reality: 10 Ways It is Changing the World" describes augmented reality (AR) as a technology that overlays digital information onto the physical world, and it is being used in a variety of fields, including gaming, education, medicine, retail, marketing, military training, construction, maintenance, entertainment, and art. Some of the specific ways AR is used include creating immersive gaming experiences, enhancing the shopping experience, training soldiers, visualizing and planning building projects, helping technicians troubleshoot equipment, creating interactive and immersive live events, and creating interactive and immersive art installations.
Fast Company, 2018	"How Augmented Reality is Changing the Way We Work" (2018) discusses the potential for AR to transform various industries and professions. The article describes how AR can improve training and education, increase productivity, and enhance customer experiences.
Forbes, 2022	"The Future of Augmented Reality: 5 Predictions for 2022 and Beyond" (2022) discusses future developments in AR technology. The article predicts that AR will become more prevalent in various fields, such as education, entertainment, and retail, and that AR devices will become more affordable and widely available.
Wired, 2017	"The Ethics of Augmented Reality: Privacy, Transparency, and Control" (2017) discusses the ethical considerations surrounding the use of AR, including issues of privacy, transparency, and control. The article describes AR's potential risks and benefits and how these issues can be addressed.
eLearning Industry, 2019	"Augmented Reality in Education: Benefits and Challenges" (2019) discusses the potential for AR to be used in education and the challenges that need to be overcome to incorporate AR into educational settings effectively. The article describes the benefits of AR in education, such as increased engagement and motivation, and the challenges, such as cost and technical issues.

Source: Survey results by authors

Based on the five articles, it appears that augmented reality (AR) technology has the potential to transform various industries and professions and is being used in various fields, including gaming, education, medicine, and retail. The articles discuss the potential benefits of AR, such as increased engagement and motivation, improved training and education, increased productivity, and enhanced customer experiences.

The articles also mention some challenges and ethical considerations surrounding the use of AR, such as issues of privacy, transparency, and control, as well as technical and cost issues.

Overall, it seems that AR has the potential to be a powerful and transformative technology with a wide range of applications. However, it is essential to carefully consider the potential risks and benefits and address any ethical concerns.

Augmented reality (AR) is the real-time integration of digital information with the user's environment. ARCore, ARKit, and Vuforia are three popular AR platforms developers can use to create AR experiences. In this analysis, we will compare the features and capabilities of these platforms to evaluate their potential for creating AR experiences.

ARCore is a software development kit (SDK) developed by Google that allows for creating AR applications on Android. It was first announced in 2017 and includes motion tracking, environmental understanding, and light estimation (Google, 2017).

ARKit is a similar SDK developed by Apple for creating AR experiences on iOS. It was first released in 2017 and includes world tracking, plane detection, and lighting estimation (Apple, 2017).

Vuforia is an AR platform developed by PTC Inc. that allows for creating AR applications on various platforms, including iOS, Android, and Windows. It includes image recognition, 3D object detection, and AR animations (PTC, 2021).

In terms of features and capabilities, all three platforms offer a range of tools for creating AR experiences. ARCore and ARKit offer motion tracking and environmental understanding, which allow for integrating digital content with the physical world. Vuforia offers additional features such as image recognition and 3D object detection, which can trigger AR experiences based on detecting specific images or objects.

Overall, all three platforms can potentially create powerful and engaging AR experiences. The choice of platform will depend on the specific needs and goals of the project, as well as the target platform (iOS, Android, etc.).

3. METHODOLOGY

Comparing the features and capabilities of ARCore, ARKit, and Vuforia would require the following:

Conduct a comprehensive review of the technical specifications, developer documentation, and other resources related to ARCore, ARKit, and Vuforia; Compare the features and capabilities of each SDK, including tracking capabilities, image recognition, and the ability to create 3D objects and animations;

Compare the performance of each SDK in terms of stability, accuracy, and frame rate; Gather feedback from users who have experienced AR experiences created using each of the SDKs and compare their satisfaction levels and preferences; Evaluate the strengths and weaknesses of each SDK and draw conclusions about their potential for creating high-quality AR experiences.

3.1. ARCore

ARCore is a software development kit (SDK) developed by Google that allows for creation of augmented reality (AR) applications on Android. It was first announced in 2017 and is designed to be used with Java/OpenGL, Unity, or Unreal.

One of the main features of ARCore is motion tracking, which allows the phone to understand its position and orientation concerning the physical world. This enables AR content to be anchored to specific points in the environment, allowing for a more seamless integration of digital content with the real world.

ARCore also includes environmental understanding, which allows the phone to detect and understand the environment's layout. This can enable AR content to interact with real-world objects, such as placing a virtual chair on a physical table.

In addition to motion tracking and environmental understanding, ARCore also includes light estimation, which allows the phone to estimate the ambient light in the environment. This can be used to create more realistic AR experiences by adjusting the lighting of virtual objects to match real-world lighting conditions.

Overall, ARCore is a powerful platform for creating AR experiences on Android devices. Its combination of motion tracking, environmental understanding, and light estimation allows for creating immersive and interactive AR experiences.

Examples of ARCore's capabilities and potential use cases:

3D mapping: ARCore can create a 3D model of the environment, allowing for the placement of virtual objects in the real world that can interact with the environment. This could be used for furniture placement in home design or visualization of products in a retail setting. (IKEA Place is an app that allows

users to see how furniture from IKEA would look in their home before they buy it. The app uses ARCore to create a 3D model of the user's environment and place virtual furniture in it).

Motion tracking: ARCore can track the device's movement, allowing virtual objects to remain fixed in the real world as the device moves. This could be used for gaming or providing information about a real-world location as the user moves through it. (Pokémon GO is a popular mobile game that uses ARCore for motion tracking. As players move around in the real world, their device's camera shows a live view of their surroundings, and virtual Pokémon characters appear on the screen as if they were there),

Environmental understanding: ARCore can detect horizontal and vertical surfaces, allowing virtual objects to be placed on tables, floors, or walls. This could be used for virtual paint samples in a home improvement store or for placing virtual exhibits in a museum. (Google's Measure app uses ARCore to allow users to measure objects and distances in the real world using their device's camera. The app detects horizontal and vertical surfaces, allowing users to place virtual measuring tapes on them to get an accurate measurement).

Light estimation: ARCore can estimate the ambient light in a scene, allowing virtual objects to be lit and shaded appropriately. This could create realistic virtual makeup looks or provide proper lighting in design visualizations.

There are many other potential use cases for ARCore and augmented reality. Some other examples could include training and education, virtual try-ons for clothing and accessories, and interactive experiences at events and attractions. (Sephora Virtual Artist is an app allowing users to try different makeup looks using ARCore. The app estimates the ambient light in the scene, allowing the virtual makeup to be lit and shaded appropriately, so users can see how it would look in different lighting conditions).

3.2. ARKit

ARKit is a software development kit (SDK) developed by Apple for creating augmented reality (AR) experiences on iOS. It was first released in 2017 and is designed to use the iOS 11 software development kit (SDK).

One of the main features of ARKit is world tracking, which allows the device to accurately track the position and orientation of the device concerning

the physical world. This enables AR content to be anchored to specific points in the environment, allowing for a more seamless integration of digital content with the real world.

ARKit also includes plane detection, which allows the device to detect flat surfaces in the environment. AR content can be placed on real-world surfaces, such as a virtual coffee cup on a physical table.

In addition to world tracking and plane detection, ARKit also includes lighting estimation, which allows the device to estimate the ambient light in the environment. This can be used to create more realistic AR experiences by adjusting the lighting of virtual objects to match real-world lighting conditions.

ARKit is a powerful platform for creating AR experiences on iOS devices. Its combination of world tracking, plane detection, and lighting estimation allows for creating immersive and interactive AR experiences.

Examples of ARKit's capabilities and potential use cases:

3D object tracking: ARKit can track the position and orientation of 3D objects in the real world, allowing virtual objects to be placed on or around them. This could be used for virtual try-ons for clothing and accessories or to provide information about real-world objects as the user interacts. (IKEA Place is an app that allows users to see how furniture from IKEA would look in their home before they buy it. The app uses ARKit to track the position and orientation of 3D objects in the real world, allowing users to place virtual furniture on tables, floors, or other surfaces).

Scene understanding: ARKit can analyze the real-world environment and detect horizontal planes, such as tables or floors, allowing virtual objects to be placed on them. It can also estimate the ambient light in a scene, allowing virtual objects to be lit and shaded appropriately. This could be used for virtual furniture placement in home design or for providing proper lighting in design visualizations. (ColorSnap is an app that allows users to match paint colors to real-world surfaces. The app uses ARKit to detect the color of the surface and provide a corresponding paint color match. It can also estimate the ambient light in the scene, allowing users to see how the paint color would look in different lighting conditions).

Motion tracking: ARKit can track the device's movement, allowing virtual objects to remain fixed in the real world as the user moves around. This could

be used for gaming or providing information about a real-world location as the user moves through it. (The Pokémon GO app uses ARKit for motion tracking. As players move around in the real world, their device's camera shows a live view of their surroundings, and virtual Pokémon characters appear on the screen as if they were there).

Face tracking: ARKit can track the movements of the user's face, allowing for the creation of interactive AR experiences that respond to facial expressions. This could be used for things like animated masks or filters in social media apps or for providing augmented reality makeup try-on. (Face Swap is an app that uses ARKit's face tracking capabilities to allow users to swap faces with other people or characters in photos and videos. The app can track the movements of the user's face and apply them to the face of the other person or character, creating a realistic and interactive face swap experience).

There are many other potential use cases for ARKit and augmented reality. Some other examples could include training and education, interactive museum exhibits, and location-based AR experiences at events and attractions.

3.3. Vuforia

Vuforia is an augmented reality (AR) platform developed by PTC Inc. that allows for creating AR applications on various platforms, including iOS, Android, and Windows. It includes various features and tools for creating AR experiences, such as image recognition, 3D object detection, and AR animations.

One of the main features of Vuforia is image recognition, which allows the application to detect and recognize specific images in the environment. This can trigger AR experiences, such as displaying additional information about a product when a user points their phone at its packaging.

Vuforia also includes 3D object detection, which allows the application to detect and recognize 3D objects in the environment. This can be used to enable AR experiences that interact with real-world objects, such as displaying a virtual car model when a user points their phone at a physical car.

In addition to image recognition and 3D object detection, Vuforia also includes AR animations, which allow developers to create animated AR experiences. This can bring AR content to life, such as creating a virtual character that moves and speaks.

Vuforia is a comprehensive AR platform with various features and tools for creating immersive and interactive AR experiences. Developers widely use it across a variety of platforms and industries.

Examples of Vuforia's capabilities and potential use cases:

Image recognition: Vuforia can recognize specific 2D images, such as logos or product packaging, and trigger an AR experience when the camera detects the image. This could provide product information or interactive promotions when users point their device at a product on a store shelf. (Blippar is an app that uses Vuforia's image recognition capabilities to trigger AR experiences when the user points their device at a specific image or product. For example, if a user points their device at a magazine cover, they might see a video or other interactive content appear on their screen).

Object recognition: Vuforia can recognize specific 3D objects, such as toys or appliances, and trigger an AR experience when the camera detects the object. This could be used to provide instructions or interactive content when a user points their device at a specific object. (The Mars 2030 Experience is an app that uses Vuforia's object recognition capabilities to provide an immersive AR experience when the user points their device at a physical model of the Mars rover. The app recognizes the rover model and displays a virtual version on the screen, allowing users to explore the rover and learn about its features and capabilities).

Text recognition: Vuforia can recognize and interpret the text in the real world, such as labels or signs, and trigger an AR experience based on the text content. This could be used to provide translations or additional information when a user points their device at a sign in a foreign language. (Word Lens is an app that uses Vuforia's text recognition capabilities to provide real-time text translations in the user's environment. For example, if a user points their device at a sign in a foreign language, the app will recognize the text and display a translation in the user's native language).

Environment recognition: Vuforia can recognize specific real-world locations or environments, such as specific stores or landmarks, and trigger an AR experience when the camera detects the location. This could provide location-specific information or interactive experiences when a user visits a specific location. (The Pokémon GO app uses Vuforia's environment recognition capabilities to trigger AR experiences when the user is at specific real-world locations.

For example, a user at a park might see virtual Pokémon characters appear on their screen as if they were really there).

Vuforia has many other capabilities and potential use cases beyond these examples. Some other areas where it could be used include education, training, and industrial applications.

4. RESULTS AND DISCUSSION

It is evident from Table 3., all three of these AR SDKs offer similar core features, such as motion tracking, environmental understanding, and light estimation. However, Vuforia offers additional features, such as image and object recognition, which can be helpful for certain types of AR experiences. In terms of programming languages, all three SDKs support popular game engines like Unity and Unreal Engine, making it easy for developers with experience in these engines to create AR applications.

When comparing the features and capabilities of ARCore, ARKit, and Vuforia, it is essential to consider each SDK's specific features and capabilities and how they can be utilized to create augmented reality (AR) experiences. Here is a summary of the key features and capabilities of each SDK and their potential for creating AR experiences:

ARCore:

Motion tracking: ARCore's ability to detect and track the position and orientation of the device as it moves allows for virtual objects to be placed and moved in the real world naturally. This is important for creating immersive AR experiences anchored to the physical environment.

Environmental understanding: ARCore's ability to detect the size and location of flat surfaces like tables and floors allows virtual objects to be placed on and interact with them. This can be used to create AR games or applications that involve virtual objects realistically interacting with the real world.

Light estimation: ARCore's ability to detect the overall lighting of an environment allows for virtual objects to be correctly lit, which can enhance the realism of the AR experience.

ARKit:

Motion tracking: Like ARCore, ARKit's motion tracking feature allows virtual objects to be placed and moved in the real world naturally. This is important for creating immersive AR experiences anchored to the physical environment.

Environmental understanding: ARKit's ability to detect the size and location of flat surfaces allows for virtual objects to be placed on these surfaces and interact with them. This can be used to create AR games or applications that involve virtual objects realistically interacting with the real world.

Light estimation: ARKit's light estimation feature allows for virtual objects to be correctly lit, enhancing the AR experience's realism.

Vuforia:

Motion tracking: Vuforia's motion tracking feature allows virtual objects to be placed and moved in the real world naturally. This is important for creating immersive AR experiences anchored to the physical environment.

Environmental understanding: Vuforia's ability to detect the size and location of flat surfaces allows for virtual objects to be placed on these surfaces and interact with them. This can be used to create AR games or applications that involve virtual objects realistically interacting with the real world.

Light estimation: Vuforia's light estimation feature allows for virtual objects to be correctly lit, enhancing the AR experience's realism.

Image recognition and tracking: Vuforia's image recognition and tracking feature allows AR experiences to be triggered by specific images or objects. This can be used to create AR applications that provide information or additional content when a specific image is scanned or recognized.

Object recognition and tracking: Vuforia's object recognition and tracking feature allows virtual objects to be placed and tracked on specific real-world objects. This can be used to create AR experiences that involve virtual objects interacting with specific physical objects.

Text recognition: Vuforia's text recognition feature triggers AR experiences with specific words or phrases. This can be used to create AR applications that provide information or additional content when specific words or phrases are recognized.

Overall, all three of these AR SDKs have a wide range of capabilities that can be utilized to create various AR experiences. The specific features and capabilities that are most important will depend on the specific goals and needs of the AR application being developed.

In conclusion, ARCore, ARKit, and Vuforia are all software development kits (SDKs) that allow developers to create augmented reality (AR) applications. They offer a range of features and capabilities that can be utilized to create immersive and interactive AR experiences.

ARCore and ARKit are both focused on mobile AR and are available on Android and iOS devices, respectively. Both offer similar core features, including motion tracking, environmental understanding, and light estimation.

Vuforia is a cross-platform AR SDK available on various platforms, including iOS, Android, and Windows. In addition to the core features offered by ARCore and ARKit, it includes additional features such as image recognition and tracking, object recognition and tracking, and text recognition.

Overall, the best AR SDK for creating AR experiences will depend on the specific goals and needs of the AR application being developed and the platform it will be deployed on. All three of these AR SDKs have a wide range of capabilities that can be utilized to create various AR experiences.

Table 3. Feature comparison table or ARCore, ArKit, and Vuforia

AR platform	Developed by	Available on	Key features	Additional features	Programming languages supported
ARCore	Google	Android devices	Motion tracking, environmental understanding, light estimation	None	Java/C++, Unity, Unreal Engine
ARKit	Apple	iOS devices with an A9 chip or later	Motion tracking, environmental understanding, light estimation	None	Swift, Objective-C, Unity, Unreal Engine
Vuforia	PTC Inc.	iOS, Android, Windows	Motion tracking, environmental understanding, light estimation	Image recognition and tracking, object recognition and tracking, text recognition	C++, Java, Unity, Unreal Engine

Source: Survey results by authors

5. CONCLUSION

ARCore is a software development kit (SDK) for Android devices that allows developers to create augmented reality (AR) experiences. Some key features of ARCore include support for motion tracking, environmental understanding, and light estimation. It also provides tools for building AR applications, including support for 3D graphics, spatial audio, and animations. ARCore is compatible with a wide range of Android devices running Android 7.0 Nougat or later.

ARKit is a similar SDK for iOS devices, providing many of the same features as ARCore. It also includes support for horizontal plane detection and image recognition, allowing for creating more immersive AR experiences. ARKit is compatible with iOS devices running iOS 11 or later.

Vuforia is an AR platform that provides tools for building AR experiences on various devices, including smartphones, tablets, and digital eyewear. In addition to features such as motion tracking and environmental understanding, Vuforia also includes support for image and object recognition and 3D graphics and animations. It offers a range of pricing options, including a free version with limited capabilities and paid versions with additional features and support.

Overall, all three platforms provide a range of tools and features for creating AR experiences, including support for motion tracking, environmental understanding, and 3D graphics. However, they differ in terms of the devices and operating systems they support and the specific features and capabilities they offer. ARCore and ARKit are both tailored to specific mobile operating systems, while Vuforia supports a broader range of devices but may require a paid subscription for access to certain features.

In conclusion, ARCore, ARKit, and Vuforia are three popular platforms for creating augmented reality (AR) experiences. Each platform offers a range of features and capabilities that can be used to create immersive and interactive AR experiences. All three platforms have the potential to create powerful and engaging AR experiences. The choice of platform will depend on the specific needs and goals of the project, as well as the target platform (iOS, Android, etc.).

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UNDERSTAND THE INFLUENTIAL ROLE OF EDUCATION ON YOUNG PEOPLE

Željka KADLEC, Ph.D.
Virovitica University of Applied Sciences,
Department of Economics

E-mail: zeljka.kadlec@vuv.hr

Martina JUKIĆ, MSc.
Virovitica University of Applied Sciences,
Department of Economics

E-mail: martina.jukic@vuv.hr

Abstract

Knowing that education, according to the United Nations, is one of the critical factors in the application of sustainable development, it is essential to enable various forms of education on sustainable development. Through this, it will be possible to encourage intrinsic motivation, empathy, solidarity and responsibility, especially among students as the selected target group of this research. This paper examines students' attitudes toward sustainable development and presents inputs and outputs at the Virovitica University of Applied Sciences. Therefore, the paper's primary goal is to determine the impact of the course on sustainability as a form of student education on increasing their awareness and the importance of applying sustainable development. The research uses a quantitative method in which a questionnaire was used to examine the attitudes of students at the Virovitica University of Applied Sciences, which made it possible to assess the subjective perception of sustainable development. For the interpretation of quantitative data, conclusions will be determined based on the collected information using the described method. The research's primary results will show students' perceptions and how the awareness of students' sustainable development changes before and after taking the courses, and what the perception of students who do not have the opportunity to learn about sustainability. The empirical contribution of the work is reflected in the strengthening

of awareness of the importance of applying the concept of sustainable development. At the same time, the applicative contribution can be seen in the review of limitations in the form of education about sustainable development and for sustainable development, as well as opportunities for improvement in the form of introducing additional training and courses and strengthening activities and discussions on sustainable development within courses on sustainable development.

Keywords: *sustainable development, sustainable awareness, education, students*

JEL Classification: *I20, I29*

1. INTRODUCTION

Achieving a balance between different aspects, such as ecological, economic, and social, enables the long-term profit of all stakeholders and their environment. The application of the concept of sustainability finds its starting point in the Triple Bottom Line concept (planet, people, profit). It includes several measures and procedures that can be applied at different levels (global, national, regional, and local). The concept of sustainable development tends to be applied on a global level. However, it can be seen that there are differences in the understanding of the importance and application of the concept of sustainable development between more economically developed countries (MEDC) and less economically developed countries (LEDC), especially the difference between education available in the mentioned countries and sustainable development. The main goal of sustainable development is the conscious use of resources that will meet the expectations and meet the needs of current society and future generations. A crucial part of applying the concept of sustainability is education and raising awareness. Therefore, education is a critical response to such changes.

This paper aims to present theoretical assumptions about sustainable development and to determine the importance of applying the concept of sustainable development and the influence of education on young people. This paper shows what sustainable development represents to students, its components with which they are familiar, and ultimately what a higher education institution does to educate them about this concept. The theoretical background of the work presents clarifications about sustainable development, educational

guidelines for the sustainable development of young people, and the direction in which the development of young people's awareness of sustainable development is moving. Through empirical research at the Virovitica University of Applied Sciences, the obtained results were collected and presented, which served as the interpretation of the theoretical and empirical parts of the work. Then a conclusion was given on the importance of education in sustainable development.

2. CONCEPT OF SUSTAINABLE DEVELOPMENT

According to Tafra-Vlahović (2009), organizations are increasingly unable to justify their existence only by their economic success, nor could their responsibility be limited to shareholders, as Friedman advocated. During this period, a view on the management of organizations developed in parallel that is based on corporate social responsibility, which is part of the business strategy and harmonizes with the business interests of corporations. This refers to the concept of stakeholders advocated by R. Edward Freeman (1984), who defined them as "any individual or group that influences the achievement of goals and is influenced by them". In 1994, John Elkington developed the Triple Bottom Line (TBL) concept in the hope of transforming previous (mainly financially oriented) business practices into a deeper reflection on capitalism and the future of organizations, looking at the key categories of the TBL concept - people, planet and well-being (The University of Wisconsin, 2021). The Triple Bottom Line concept becomes the basis for studying socially responsible business and the subject of discussion in the modern age. At the same time, organizations should adapt their activities and operations and inform and involve internal and external stakeholders to influence the development of individual organizations, the entire economy, and social awareness.

The reconstruction of the world devastated in the twentieth century was the main aim of several countries. The consequences of World War II brought with it the emergence of various organizations whose primary mission and vision was to improve the living conditions of people who went through horrors but also to restore and provide an opportunity for a better tomorrow to those who are yet to come in the future. Peace, education, and economic development became the agenda by which countries that wanted to experience development were guided. All these associations have brought with them the beginning of a significant change: globalization. The unification of the world and the creation

of a global village provided advantages and disadvantages. The opening up of the market has allowed for easy fluctuation in production processes. However, it has also brought the consequences of the overexploitation of resources and the pollution of the environment. As a result of the strengthening of care for the environment and society, the United Nations mentions in its beginnings the importance of raising awareness of sustainable development. During its Conference on Environment and Development in Rio de Janeiro in 1992, the United Nations presented a definition of sustainable development where the main components are equality and fairness, i.e., they presented the goal of sustainable development as a harmonious life for people who care about the future. In the same year, Agenda 21 was presented, representing the action plan of various organizations in the field of environmental protection (AGENDA 21, 1992).

In order to create as much value as possible for the organization over a more extended period, organizations are increasingly turning to sustainable business, where it is necessary to introduce appropriate activities into the policy and strategy of the organization, which brings numerous advantages and increased profitability (Boić et al., 2012). The sustainability of the organization is expressed by social, economic, and ecological sustainability, which is researched by numerous authors (e.g., Boić et al., 2012; Črnjar & Črnjar, 2009; Bartoluci et al., 2015; Ćulum et al., 2008; Marrewijk, 2003; Čatić et al., 2008; Ruiz-Lozano & Wigmore-Alvarez, 2012; Rončević & Rafajac, 2012; Artaraz-Minon et al., 2019; Afrić Rakitovac, 2017; Pavić-Rogošić, 2009, Buzov et al., 2020).

Sustainable development was first used in the "World Conservation Strategy" of 1980. In the Agenda 21 document, sustainable development focuses on social, ecological, and economic factors, biotic and abiotic resources, and alternative activities' long-term and short-term advantages and disadvantages. Sustainable development aims to achieve progress and prosperity for present generations while ensuring that future generations can develop and live in a safe and secure environment (AZOO, 2011).

In 2005, the Economic Commission for Europe (UN/ECE) adopted a strategy for sustainable development called "The United Nations Economic Commission for Europe Strategy for Education for Sustainable Development" for all countries to promote education and sustainable development. Her goals are:
1. "ensure that political, regulatory, and operational frameworks support ESD;

2. promote sustainable development through formal, non-formal, and informal learning;
3. to provide teachers with the expertise to incorporate sustainable development into their teaching;
4. ensure access to appropriate tools and materials for ESD;
5. promote research on ESD and its development;
6. "Strengthen cooperation for ESD at all levels within the UN/ECE region" (UN, 2005).

The United Nations conference in New York in 2015 led to a global development agenda called Agenda 2030, which contains 17 global targets (Table 1.).

Table 1. Global Goals of sustainable development

Goal 1: Eradicate poverty everywhere and in all forms.
Goal 2: Eradicate hunger, achieve food security and improved nutrition, and promote sustainable agriculture.
Goal 3: Health: To ensure a healthy life and promote well-being for people of all generations
Goal 4: To ensure inclusive and high-quality education and to promote opportunities for lifelong learning
Goal 5: Achieve gender equality and empower all women and girls.
Goal 6: Ensure access to drinking water for everyone, sustainably manage water, and ensure hygienic conditions.
Goal 7: Ensure access to reliable, sustainable, and modern energy at affordable prices for all
Goal 8: Promote inclusive and sustainable economic growth, full employment, and decent work.
Goal 9: Build adaptive infrastructure, promote inclusive and sustainable industrialization, and encourage innovation.
Goal 10: Reduce inequality within and between countries.
Goal 11: Make cities and settlements inclusive, safe, adaptable, and sustainable.
Goal 12: To ensure sustainable forms of consumption and production
Goal 13: Take urgent action in the fight against climate change and its consequences.
Goal 14: Conserve and sustainably use the oceans, seas, and marine resources for sustainable development.
Goal 15: Protect, establish, and promote the sustainable use of terrestrial ecosystems; sustainably manage forests; combat desertification; stop soil degradation; and prevent the destruction of biological diversity.
Goal 16: Promote peaceful and inclusive societies for sustainable development, ensure access to justice for all, and build effective, accountable, and inclusive institutions at all levels.
Goal 17: Strengthen the means of implementation and strengthen the global partnership for sustainable development.

Source: Pavić-Rogošić, 2015

According to Črnjar and Črnjar (2009), the concept of sustainable development has three main elements: the concept of development, needs and future generations. It represents the definition of sustainable development where the needs of today's generations are met, but their use will not challenge the needs of future generations. The concept of sustainable development focuses on preserving the present for the future, which also means that any development

should be based on preserving natural resources, reducing the gap between the poor and the rich, and protecting the environment. The economic, sociological, and ecological elements of the concept of sustainable development include the growth of the economy of each country, the improved quality of human life in terms of health, education, and existence, and the reduction of environmental pollution to protect the soil, plants, animals, and natural resources that are a necessity for life. Sustainability refers to the actions of all people, businesses and organizations. Every person can contribute to sustainable development by reducing energy consumption, using public transport, buying products with an ecological sustainability label, and more.

2.1. Guidelines for Education for sustainable development

Education is the foundation for progress, and learning about sustainable development involves developing the knowledge and skills to help individuals understand sustainable development's complexities and develop critical thinking that they will apply. When discussing educational guidelines, it is essential to mention the importance of introducing teaching subjects that could broaden the student's perspective. For instance, in math tasks, assign tasks that mention climate change, protection of the environment, and so on. In addition to the knowledge learned, it is helpful to have practical courses where one can truly see how to function as an individual. For example, students go to recycling yards as part of a course on sustainable development. The knowledge of sustainability comes from the community in which the student is situated, which leads to the fact that the integration of educational institutions, families, business sectors, and the individual himself is necessary. One of the most critical educational guidelines is using creative and innovative learning approaches. Changes surround people, and the answer to those changes lies in education.

Education aims to provide individuals with knowledge and skills and prepare them to participate in day-to-day tasks. It is also important to note that the greatest responsibility is placed on teaching staff to pass on their knowledge to younger generations. AZOO (2011) notes that teachers must know the topic of sustainable development, have empathy, and be ready to cooperate with pupils or students. Furthermore, teamwork and creativity in task resolution must be promoted. One of the principles by which the Republic of Croatia is moving towards sustainable development is education in the service of

sustainable development. This is supported by numerous studies (e.g., Črnjar, 2019; Rabušicova & Engdahl, 2012; Šibalić et al., 2015; Cvitković, 2016) that consider the development of sustainability through education.

2.2. Sustainability at Institutions of higher education

Higher education institutions play a significant role in creating life for young people. As such, they are responsible for how and how students will be taught about the importance of sustainable development. The sustainable development of organizations is achieved through the economic, social and environmental components of the socially responsible enterprise. As part of the economic component, a balance is struck between the need to improve the quality of life; within the framework of the social component, efforts are made to achieve social well-being and peace; and within the framework of the ecological component, the preservation of natural resources is required (Miketić-Curman, 2013). As part of sustainable development, environmental responsibility as a priority for the economy is regulated by many standards, such as the ISO 14000 standard of the International Organization for Standardization, the Charter on Sustainable Development for the Business Sector of the International Chamber of Commerce, the CERES Principles, the UN Global Compact, the Global Reporting Initiative (GRI), and the Environmental Management and Monitoring Program (EMAS) of the European Union.

Given that sustainable development is achieved through the responsibility of individuals and organizations, it is essential to include social responsibility in organizations. The array of components with which socially responsible affairs are increasing, and within the framework of many theoretical and practical considerations, three primary levels of socially responsible business have been highlighted. Some activities within the concept of social responsibility that is observed and analyzed include responsibility towards the environment, norms of business and management, and human rights. According to Kadlec and Leko Šimić (2022), research on social responsibility at universities aimed to gain insight into how much higher education institutions (universities in Croatia) are ready to include sustainable development in their operations, what their social responsibility is, and how much can be said about it and found out through their websites and strategic documents. According to the same, universities are cited as the best representatives of an organization that can and should apply

sustainable development. The primary areas of social responsibility, which are also crucial for sustainable development, were analyzed. According to Barroso (2007), socially responsible institutions contribute to employees' quality of life by investing in people and promoting a dignified workplace imbued with respect. Those who care for and protect the environment and apply the code of ethical behavior are also socially responsible. Indeed, these are also the institutions that connect with the community and spread philanthropy, which supports the basic principles of sustainable development.

The Republic of Croatia's sustainable development strategy includes increasing literacy, increasing the share of highly educated people, and encouraging lifelong learning. Given the increase in market demands, liberalization, deregulation, and decentralization of educational forces with the function of building trust and social responsibility are increasingly important (Brajdić et al., 2016). More than 300 higher education institutions have supported the Higher Education Sustainability Initiative (HESI) since 2012. The initiative's signatories are committed to educating students about sustainability through various teaching disciplines, encouraging scientific research, disseminating knowledge about sustainability, building green campuses, and supporting the local community. The model of sustainable schools is a tool for implementing sustainable development at higher education institutions. In their work, Afrić Rakitovac (2017) presented a sustainable university model through four phases: defining the vision, defining the mission, appointing the Sustainability Committee, and creating and implementing strategies to promote sustainability. Wherein strategies to promote sustainability refer to four key areas: education, research, partnership with the community, and management of environmental impacts.

The role of higher education institutions in promoting sustainable development is crucial because it is about educating people who will make development decisions tomorrow as managers in companies and educating people who will educate younger generations. The study of sustainable development at universities in the Republic of Croatia concluded that sustainable development is not applied sufficiently. Therefore, it is necessary to develop more interdisciplinary programs that deal with the study of sustainable development, which also implies the training of professional staff that deal with these issues (Cegur Radović et al., 2016).

The work of higher education institutions sets an example for students of what to do and how to do it, and by involving them in solving problems in their

immediate surroundings, they achieve this and increase awareness of the importance of sustainable development. Institutions can and should apply aspects of sustainable development in their daily work, involve students in research activities, use resources rationally, use recycled paper, or reduce water consumption. The possibilities are great, but reasonable use is necessary. Some of the opportunities that educational institutions can implement to raise awareness of sustainable development and increase its application are listed in the following table (Table 2.).

Table 2. Examples of improving the application of sustainable development in educational institutions

Sustainable development
1. Critical reflection through a case study on the application of sustainable development
2. Mathematical problems with examples of environmental problems
3. Creation of applications for measuring the amount of waste produced by an individual
4. Holding field classes in institutions and organizations that promote sustainable development and deal with solving these problems
5. Going to recycling yards as part of field lessons
6. Switching off electrical devices in empty halls and cabinets
7. Using recycled paper
8. Possession and use of recycling containers
9. Uses eco products for cleaning
10. Installation of solar panels on the roofs of institutions
11. Education and interactive workshops on sustainable development
12. Actions related to community and environmental protection problems
13. Making and using canvas bags
14. Making thermoses for coffee or water bottles that can be given as gifts to students and on which tips for conserving resources will be printed
15. Panel discussions on crucial problems in the immediate or broader social community

Source: Authors' work

Table 2 lists only some examples that can be adopted in everyday life. The goal is to include as many concepts of sustainable development as possible in teaching subjects (especially those not directly related to this concept) to create new generations. These same institutions can help the country or be an example to young people through their activities; this can be seen through using renewable energy sources, recycled products, and what minimally harms the environment. Internationalization also significantly contributes to the process of university sustainability. Globalization and internationalization in education bring new needs for social action and look at responsible education from a wider angle

of the action. Institutions can support students and employees through various associations and mobilizations with other institutions and thus learn from each other about implemented activities and plans.

According to the United Nations Economic Commission for Europe's Strategy for Education for Sustainable Development, learning activities should be carried out primarily in the local area, i.e., encouraging young people to notice environmental protection problems in their residences and then study them globally. Learning should, in addition to traditional methods, be done by introducing discussions, clarifying the values of life, applying outdoor learning, encouraging students to create projects, doing case studies, or analyzing examples of good practices in other countries (UN, 2005). In addition to educational institutions, it is necessary to create a synergy with the Ministry of Science and Education, which could provide financial support for creating textbooks and visual aids that will promote sustainable development.

2.3. DEVELOPMENT OF YOUTH AWARENESS FOR GLOBAL SUSTAINABILITY

The importance of sustainable development is undeniable. Education on the dangers and growing problem of over-exploitation of resources and environmental pollution lead to awareness and, in addition, the quality development of individuals and the economy. A young person is also a reflection of the future, and developing a young person's consciousness is crucial for a more sustainable future for the planet. It is possible to raise youth consciousness by integrating sustainable development into the school curriculum so that young people get information about what it is, how man functions in nature, and how it affects nature. The fastest and easiest way to reach young people is through social networks. Different campaigns could and should encourage young people to be present and aware that changes and problems around them are happening.

How the development of young people's awareness of global sustainability can be influenced is through education, which, according to UNESCO (2005), is aimed at:
- Respect and appreciation for current and future generations
- Understanding and accepting diversity
- Responsible use of natural resources
- Encouraging young people to create attitudes and understanding, their willingness to research, and their willingness to act responsibly.

The United Nations Decade of Education for Sustainable Development also presents pedagogical principles for sustainable development that are imbued with interdisciplinary, critical thinking, willingness to solve problems, community participation, and local relevance. It should be emphasized that there is a need to establish synergy between initiatives and programs and to mobilize the media to use the concepts.

3. ANALYSIS OF STUDENTS' ATTITUDES ON THE IMPORTANCE OF APPLYING THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Education plays a crucial role in raising awareness of the importance of sustainable development. There are many ways to educate about sustainable development, including educational institutions, various campaigns and projects, media, creative content, and corporate initiatives. In order to make a real impact, it is essential to conduct continuous education about sustainable development. This means that this approach must be integrated into all aspects of society, including educational institutions, business organizations, government agencies, and civil society. Given that sustainable development is a modern concept that presents numerous challenges to organizations, the paper aims to examine students' awareness of the importance of applying the concept of sustainable development. In the research, emphasis was placed on the Virovitica University of Applied Sciences students, where we wanted to analyze their perception of sustainable development and its components. The work aimed to highlight how students perceive the concept of sustainable development and responsibility for sustainable development, what it includes, how students find all the necessary information about sustainability, and what their habits are in applying the concept of sustainable development.

3.1. Research methodology

The research included a qualitative analysis (analysis of secondary data from previous research) to establish a theoretical framework. However, it also included a quantitative analysis (a survey of students at the Virovitica University of Applied Sciences) to determine the perception of the importance of applying sustainable development and understanding the influence of education on young people.

The research (quantitative analysis) relied on primary data sources collected through the survey methodology. For this study, a questionnaire was developed to examine student attitudes as a tool for basic research. The data was collected directly from the students through personal contact, which tried to include as many respondents as possible in the target group of the research. The research target group was all students (333 students, including a few who enrolled) at the Virovitica University of Applied Sciences in undergraduate and graduate studies.

Sustainable development inevitably ensures the growth and development of individuals and organizations. In this context, a literature review reveals numerous studies (e.g., Anđić, 2007; Mroz et al., 2018; Kurtović & Ledinski Ficko, 2022; Anđić, 2020; Vukić & Jovanović, 2020; Mroz, 2019; Vukelić & Rončević, 2018; Vukić, 2020; Raditya Lezaic et al., 2018; Vukelić et al., 2011) that talk about analyses related to teachers and their connection with education for sustainable development. However, a few of them refer to pupils or students. The reason for observing students at the Virovitica University of Applied Sciences is to analyze the awareness of students about sustainable development, those who have taken courses related to the concept of sustainability and those who have not been exposed to the above through courses. The questionnaire was conducted from March 6 to March 20, 2023. The sample of respondents was based on 162 students who filled out the questionnaire. Using this quantitative method will allow descriptive analysis to interpret differences in the sample. The collected data were processed using a descriptive statistical method and presented as graphs and tables.

3.2. Results and Discussion

In general, questionnaires provide information on several key areas. The primary data on the respondents presented data on gender, previously completed education, subjects they may have taken in previously completed high school education, and which major they enrolled in at Virovitica University of Applied Sciences. Questionnaires were completed by 55.6% of female respondents and 44.4% of male respondents. In order to determine which respondents had a high school education, the responses received referred to career paths such as economist, commercialist, hotel tourism technician, administrative clerk, electrical technician, graphic technician, computer technician, mechatronics techni-

cian, Bjelovar School of Economics and Office Technology, hospitality, tourist school Osijek, gymnasiums, technical school Daruvar, and others. It is essential to mention that 29% of respondents had a specific subject related to sustainable development: Global business environment, Politics and Economy, Sustainable development, Environmental protection, Globalization, Economics trade, Ecological agriculture, and others. Only some computing and electrical engineering students indicated they had a high school course on renewable energy sources that touched on sustainable development. The research included students from all majors at the Virovitica University of Applied Sciences, and the table (Table 1) shows the courses by major they could take as part of those study programs. The research aimed to answer whether students who attended the mentioned courses (Table 3) are more aware of the importance of sustainable development and have more knowledge about the mentioned concept.

Table 3. Study directions and courses at Virovitica University of Applied Sciences

Undergraduate study program directions	
Study direction	*Course*
Management	
Informatics Management	Environmental Management
Management of Rural Tourism	Tourism and sustainable development
Entrepreneurship	
Entrepreneurship	Environmental Management and Sustainable Development
Software Engineering	
Software Engineering	-
Electrical engineering	
Telecommunications and Informatics	-
Graduate study program directions	
Management	
Management of Small and Medium Enterprises	Sustainable Development Planning in Tourism
Destination Management	Sustainable Development and social responsibility

Source: https://vuv.hr/studijski-programi/diplomski-studij/ (April 10, 2023)

The distribution of respondents according to the enrolled study course is presented in Figure 1.

Figure 1. Enrolled study course at Virovitica University of Applied Sciences
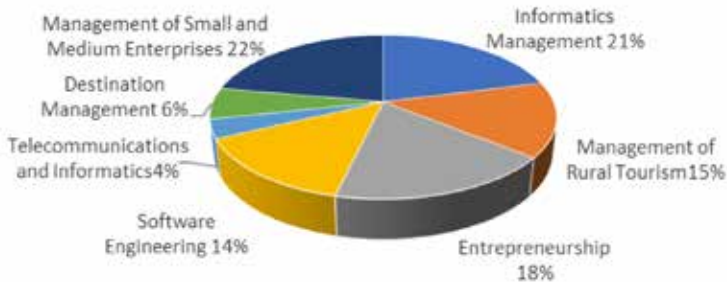
The second set of questions examined students' attitudes toward sustainable development, their habits and behaviors, and their perception of their role in promoting sustainable development. The review revealed that the students know the concept of sustainable development and what it implies, which they confirmed by declaring that sustainable development is related to environmental care, responsible business, economic impact, use of resources, green thinking, social development, efficient business without negative impacts, concern for the future, etc. According to the survey, computing and electrical engineering students mainly associate sustainable development with the environment. The highest percentage (45.1%) of answers about sustainable development is rated by students as average, which is also proven by grade 3. Speaking about the purpose of sustainable development, it can be highlighted that respondents with 50.6% chose both answers (to achieve the greatest possible economic growth and development of society while preserving the environment) as correct.

In comparison, the majority (44.4%) of the rest decided to develop society by preserving the environment. Based on the above, it can be concluded that students know the purpose of sustainable development through achieving a balance between social, economic, and environmental goals.

Furthermore, they point out that the three essential components of sustainable development are society, the economy, and the environment. 92% of them believe that sustainable development meets the needs of both current and future generations; 88.3% of them believe that by purchasing products from the surrounding area, they contribute to sustainable development; and 93.8% of them believe that well-being and quality of life are related to sustainable development, which can infer that students are familiar with the primary determi-

nants of sustainability through the courses they take at the Virovitica University of Applied Sciences. The only questionable item is that 63% of them believe sustainable development is a modern name for environmental protection. This indicates much room for a complete transformation of student thinking on sustainable development. This is underpinned by research data that shows that most respondents who believe sustainable development is a modern name for environmental protection are students of the technical field at the Virovitica University of Applied Sciences.

The Global Sustainable Development Goals, or UN Sustainable Development Goals, represent a global plan to achieve sustainable development by 2030. They consist of 17 goals and 169 sub-goals to solve today's social, economic, and environmental problems (IDOP, 2021). 59.3% of respondents point out that they have heard of global goals, and 48.1% point out that there are 17. Half of them also confirmed Knowledge of global goals (an open question for stating the global goals they know) and highlighted some passed goals. When asked what the HDI (Human Development Index) includes, the respondents confirmed their knowledge of the mentioned tool for observing sustainability (Figure 2).

Figure 2. Students' Perception of HDI - Human Development Index

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Source: Authors' work

Expressing their views on stakeholder accountability for sustainable development, students believe that associations and the business sector are the most deserving. At the same time, they do not consider their contribution, the contribution of local authorities, or the contribution of experts and scientists as the most deserving of sustainable development. This has proven somewhat contra-

dictory, as students are unfamiliar with sustainable development. According to statements related to habits in sustainable development, low scores (low scores indicate complete agreement with the stated statement) gravitate around the statement that the consequences of climate change will occur in the future, so they are not too interested, that they are not used to taking into account rational water consumption., paper, and energy, and that they are not concerned with solving other people's problems. They emphasize their average agreement with the statements concerning the statements that the increase in living standards is the most important, that their behavior in everyday life cannot significantly affect the negative impact of climate change when buying products, they ignore the country of origin and the declaration, they do not want to allocate more money for products that are more environmentally friendly, that they use those means of transport that enable fast transport, and their degree of pollution does not bother them. So, they both agree and disagree on these issues. It is disappointing that 94.4% of them point out that they do not regularly participate in activities related to sustainable development. However, they point out that they direct their lives towards sustainability by recycling and separating waste, saving electricity and water, recycling clothes, walking more often instead of driving a car, or agreeing that more people drive one car instead of more. By observing the questions on sustainable development, one may conclude that students in the technical field do not have this knowledge and awareness of the importance of applying sustainable development. The research suggests an opportunity to build greater awareness and motivation for applying sustainable development at every opportunity.

Through information and education, as essential elements of the questionnaire, students' perceptions of educational initiatives related to sustainable development and their importance can be examined. What the sustainability information system is like and where students find the most information about this concept can be seen in the following graph (Figure 3). Students get the highest percentage of information through the media: 80.9% (131 respondents) and 73.5% (119 respondents) through the university (as an educational institution).

Figure 3. Informing about sustainable development
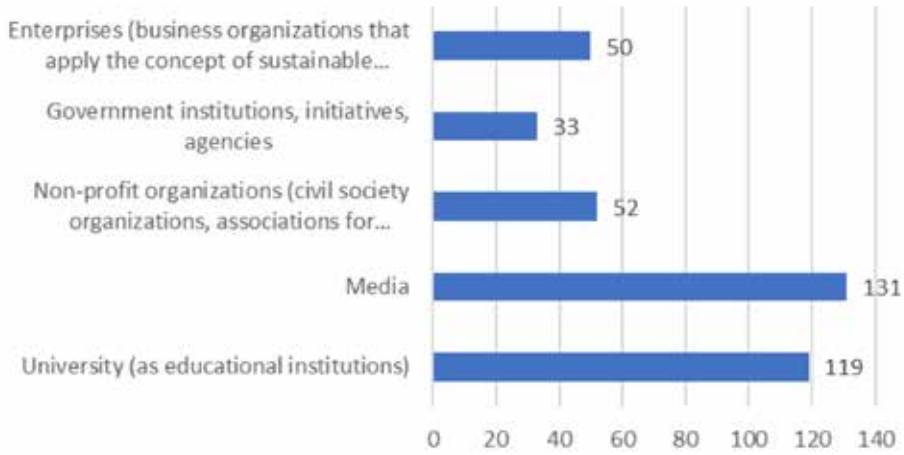
In a request for ratings on their attitude towards information on sustainable development, students gave the highest ratings to the claims that they get the most information at the university through courses and through associations that play an essential role in informing the public, raising awareness, and warning about problems related to sustainability. They believe they can still contribute significantly to sustainable development, which confirms that their conscience of the importance of application has been raised to a higher level. Interestingly, students think about sustainability in their free time (Figure 4) and talk to their friends about environmental protection, climate change, and social problems (40.1% - grade 3; 38.90% - grade 4 and 15.4% - grade 5). Also, follow pages dedicated to environmental protection and/or human rights on social networks (24.7%). 54.9% of respondents pointed out that after taking the course, they did more research and paid more attention to sustainable development.

The last group of questions touched on their educational environment, where respondents showed a positive attitude towards sustainable development and where they gathered the most information about sustainable development. The students emphasized that the university is an institution that applies the concept of sustainable development, where their responses gravitate towards average and higher-than-average scores (Figure 4.).

Figure 4. Students' perception of the application of sustainable development at the Virovitica University of Applied Sciences
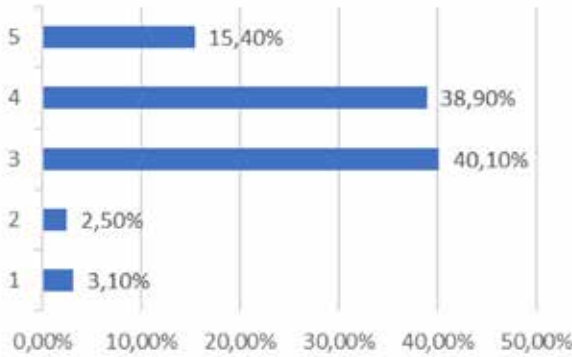
By questioning respondents' views on the dimensions of sustainability to which the university pays attention, it can be concluded that they pay the most attention to the economic dimension (30.2%) and the least to the environmental dimension (13.6%). The following graph shows the student's overall reflection on sustainability at the university (Figure 5).

Figure 5. Students' Perceptions of the Application of sustainable development at Virovitica University of Applied Sciences by Dimensions
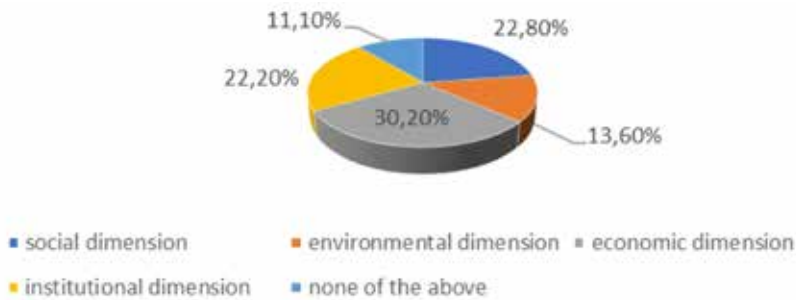
Interestingly, the students noted that the Virovitica University of Applied Sciences included enough courses in its study programs (79.6% of respondents). It must be pointed out that there are no courses on technical courses at Virovitica University of Applied Sciences that raise awareness of sustainable development, and there is room for improvement because sustainable devel-

opment concerns all people and professions. Among the recommendations for activities or workshops dedicated to raising awareness of sustainable development, students highlight workshops on sustainable development and environmental protection, collecting bottles, cleaning the environment, and workshops on biodiversity.

3.3. Limitations and recommendations for the future research

By researching the attitudes of students towards sustainable development at the Virovitica University of Applied Sciences, it was revealed that students are most familiar with the concept of sustainable development and what it encompasses, which is mainly based on the fact that only some of them had contact with sustainable development during their previous high school education. However, most students attended some of the courses related to sustainable development. This research assumes that students in social studies at Virovitica University of Applied Sciences are more aware of the importance of applying the concept of sustainability than students in technical studies. The research confirmed the initial assumption and found that there are still many ways to improve in this regard. The advantages of this research are that it provides insight into students' attitudes toward sustainable development and indicates how familiar they are with the concept of sustainability. However, certain limitations could also be considered in interpreting the results. For example, the research focuses only on students at one towpath. For a more complete picture and assessment of the situation, it would be necessary to research the entire territory of Croatia. Also, only a small number of students (students of Computer science and Electrical engineering) have minimal knowledge about sustainable development, which can affect their understanding of this concept. In this direction, the university could offer additional workshops and education to students to raise their awareness to a higher level, where they will become more aware of its importance and motivated to apply it at every step. To enhance research, more detailed research can be conducted into the habits and behaviors of students regarding sustainable development and their perception of their role in promoting sustainable development. Also, one of the possibilities for improvement is the analysis of the differences between more economically developed countries (MEDCs) and less developed countries (LEDCs) since LEDCs cannot implement international sustainable development strategies and, therefore,

are incompetent to achieve a similar level of education. Further research can be done through cultural and socioeconomic factors affecting education and, therefore, the knowledge and awareness of sustainable development.

4. CONCLUSION

Preserving social and environmental heritage is everyone's responsibility, and how it is used must contain essential determinants of sustainable development. Sustainable development is a guideline that recommends how a person should live daily and how much they will endanger or protect nature and resources to ensure a healthy future for those who come into their daily lives. Preserving social and environmental heritage is the responsibility of all, and how it is used must contain critical determinants of sustainable development. Education is a responsibility because it is crucial to human potential, one of today's most important resources.

It is essential to understand how an individual's behavior affects an entire society's behavior. According to the research results, it can be concluded that by listening to courses related to sustainability, students achieved a higher level of knowledge and awareness of the importance of sustainable development compared to students who did not have as much insight into those mentioned above. There is also much room for improvement to insert as many activities and interactions as possible into the teaching and apply it in practice. For example, various work actions can be held with students and redirect students to use public transport as much as possible, which is possible with various subsidies. It is essential to highlight the advantages and disadvantages of neglecting the environment and society's problems, which can be done through education and workshops within and outside classes.

Institutions influence people, so they should be the first to invest and try to incorporate the examples mentioned in this document. It can be concluded that students' interest in sustainable development problems would increase if all institutions and organizations provided as much information and opportunities for involvement as possible. As could be concluded from conducted research, students lack more workshops and more opportunities to solve community and environmental problems, which, in turn, could be assessed through the courses they attend. It is not sufficient for young people to learn to read and write; it is also essential to make them understand that the paper they read comes from na-

ture, which they must respect, recycle, and encourage others to do the same. The inscription of your first and last name on an object is not meaningful enough, as is the imprint that someone will leave now, recognizing that sustainable development is the only way to a better future.

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IMPACT OF THE COVID-19 ON THE ONLINE STUDYING

Sanja KNEŽEVIĆ KUŠLJIĆ, Ph.D.
University of Slavonski Brod, Department of Social Sciences
and Humanities, Department of Economics

E-mail: sknezevic@unisb.hr

Abstract

Education is one of the fundamental rights of humanity. The outbreak of Covid-19 enforced some restrictions that have harshly affected educational sectors worldwide. This paper aims to investigate the perception of students of the University of Slavonski Brod from the Republic of Croatia about the impact of Covid-19 on specific aspects of studying and to determine whether there is a statistically significant difference in age, student status and student employment status with the level of satisfaction of an individual variable.

This paper's empirical study included students from the University of Slavonski Brod. An anonymous questionnaire was used to collect data. Descriptive statistics and T-tests were used for data processing. The statistical analysis of the results was done in the statistical program SPSS. The research results confirm that there are statistically significant differences in certain variables. The limitation of this research is that it is geographically limited to only one University. Future studies should include students from all over Croatia and also increase the number of questions in the questionnaire to analyze the broader aspect of corona crisis's impact on online education. This study has important implications for including online studying in higher education in post Covid-19 in Croatia, especially in case of similar circumstances in the future.

Keywords: *Covid-19, students, online, studying, education*

JEL Classification: *A22, A23, I23*

1. INTRODUCTION

Covid-19 affected education around the world. According to the World Bank, it has disrupted education in over 150 countries and affected 1.6 billion students (World Bank, 2022). "It forced higher education institutions to react rapidly to the changing environment, moving their operations online and adopting crisis management strategies" (UNESCO, 2022). According to the United Nations' (2019) fourth Sustainable Development Goal (SDG), everyone must have access to "quality education because it is fundamental to creating a peaceful and prosperous world. Education gives people the knowledge and skills they need to stay healthy, get jobs and foster tolerance" (United Nations, 2019). So, education staff worked from home, and this presented significant challenges for many of them because it was a novelty. Most higher education institutions in Croatia have also switched to online classes. Various studies show the advantages and disadvantages of online classes. Although online studying opened a window to many advantages in terms of increased innovations, this has faced a problem in fully adapting to online environments and harnessing the benefit of technology. "Most HEIs and their professors were unprepared for the new delivery method since they did not have previous experience in virtual environments and lacked the necessary knowledge, skills, and resources to adapt their courses to the virtual classroom dynamics successfully" (UNESCO, 2022).

"At the same time, Covid-19 has provided an opportunity to reflect critically on how higher education is organized and to formulate creative solutions and alternative possibilities for future directions in higher education" (Farnell et al., 2021). Some of the biggest problems that students face are a bad internet connection, spending all day in front of the computer, lack of practical classes, and lack of close interaction with colleagues... while the advantages include a flexible schedule, autonomy in planning time, more time to study, more time to rest, lower costs (no travel costs), the benefit of being with family, less stress. However, many "findings reveal that universities worldwide are moving more and more towards online learning and also propose online and remote learning as a necessity in times of lockdowns and social distancing due to the Covid-19 pandemic" (Wahab, 2020).

Precisely because of all the above, this paper analyzes the perception of students about the impact of Covid-19 on studying and tries to determine whether there is a statistically significant difference in age, student status, and student

employment status with the level of satisfaction of a particular variable. Therefore, following the aim of the research, the following hypotheses of the surveyed students were defined:

H1: The age of students affects the perception of the impact of Covid-19 on online studying

H2: Student status (regular/part-time) affects the perception of the impact of Covid-19 on online studying

H3: A student's employment status affects the perception of the impact of Covid-19 on online studying

The results of this research can be used to understand students' perceptions of how successful the online classes were and found that there are many problems with online teaching. The paper starts with an introduction with definitions, as well as hypotheses and a description of the reasons for the analysis of student's perception of the impact of Covid-19 on studying. A literature review describes the theoretical background and follows a methodology that includes the sample, data, variables, and methodological approach. The empirical section contains the survey results, followed by a discussion, conclusion, limitations, and suggestions for future research.

2. LITERATURE REVIEW

Research theme papers related to Covid-19 and education are extremely extensive. A broad spectrum of research deals with this theme in the world and Croatia. According to the Croatian Agency for Science and Higher Education, the influence of pandemic circumstances on the experience of studying in the academic year 2020/2021 in Croatia was investigated. Students expressed satisfaction with specific segments of the organization of online classes and exams, such as access to teaching materials from home (73%), interaction with teachers in a virtual environment (60%), criteria and methods of student evaluation (63%) and objectivity of evaluation (60%), 54% had secured conditions for high-quality distance learning in the accommodation where they stayed, and 47% of students to some extent agree that studying in an online environment provides more space for unethical behavior when testing knowledge (ASHE, 2021). According to the European Student Union, research was conducted in cooperation with the University of Zadar in the Republic of Croatia, IRO, and

the Croatian Ministry of Science and Education on student life during the pandemic. The research gave exciting results about students' adaptation to studies during the Covid-19 pandemic: most students (80.7%) felt confident in using platforms for online classes such as MsTeams, Zoom, etc., most students have their computer (89.3%), but only 41% have a good internet connection, most students often or always have a quiet place to study, while 3.3% of students do not have a quiet place to study. (European Union, 2021)

Ilić analyzed the satisfaction of Libertas International University in Croatia students with implementing classes during the Covid-19 pandemic. 85% of students are satisfied with their computer equipment. More than 80% of students are satisfied with the University's technical and administrative support. More than 80% of students stated that the literature and other materials needed for following classes and participating in exercises were available electronically. Also, regarding the possibility of using illegal methods (copying) on the remote exam, the majority of 62.9% did not agree that they could have used the possibility of "cheating" on the exam to the full extent (Ilić, 2021). Velki evaluated the distance learning of Osijek students in Croatia during the Covid-19 pandemic. The author concludes that distance learning proved extremely useful during the pandemic, but also some students expressed dissatisfaction (Velki, 2022).

Pavlović et al. (2021) analyze the impact of Covid-19 and online learning on higher education in Serbia. The authors reveal the negative impact of the pandemic on education at the global level, particularly the technological obstacles and the inaccessibility of the Internet to sensitive groups of students. Zawacki-Richter (2020) looks at the effects of the Covid-19 pandemic on teaching and learning at universities in Germany. Empirical research has shown a greater desire for digital learning and a certain expectation level. Agasisti and Soncin (2020) provide an overview of the impact of the pandemic in Italy, particularly an overview of the University's activities at Technological University located in Milan. They consider that online and blended learning can innovate and improve teaching, but the main focus remains on relations. Sáiz-Manzanares et al. (2022) measured student satisfaction with online teaching during Covid-19 in Spain. The results indicate differences in some aspects of satisfaction, and students rated the use of active methodologies and technological resources positively. However, they concluded that their use required more work time.

Alshurideh et al. (2021) explore the challenges, opportunities, and implications of the Covid-19 pandemic in the United Arab Emirates (UAE) higher education context. They consider that institutions should return to traditional teaching methods as soon as possible by incorporating the benefits of virtual learning into traditional learning methods, as virtual learning cannot replace traditional methods. They also introduce the various impacts of online educational tools used by higher education universities in the UAE during the spread of Covid-19. Camacho-Zuniga et al. (2021) analyze the feelings of over 13,000 high school, undergraduate, and postgraduate students across 36 campuses over eight subsequent weeks from the onset of the Covid-19 pandemic in Mexico. Their findings demonstrate that students at all academic levels (high school, undergraduate, and postgraduate) demonstrated negative feelings and low energy levels due to the lockdown. Hettiarachchi et al. (2021) investigated students' satisfaction with their online learning experience at Sri Lankan universities during the Covid-19 pandemic. The authors found that student satisfaction in online learning is closely related to student motivation, e-learning challenges, and interaction.

Aristovnik et al. (2020) present the most comprehensive study on how students perceive the impacts of the first wave of the Covid-19 crisis in early 2020 on various aspects of their lives globally in 62 countries. The findings show that students were most satisfied with the support provided by teaching staff and their universities' public relations; deficient computer skills and a higher workload prevented them from perceiving their improved performance in the new teaching environment. Faize and Nawaz (2020) measured students' satisfaction levels with online learning during Covid-19 in Pakistan. Results showed challenges reported by students in online education: the lack of resources and internet services, lack of interaction during online classes, distraction at home, lack of activities, and difficulty setting a routine for online learning.

Almusharraf and Khahro (2020) evaluated student satisfaction with online learning platforms and learning experiences during the coronavirus Covid-19 pandemic in the Kingdom of Saudi Arabia. The research findings showed that participants were delighted with specific online platforms (Google Hangouts, Google Classroom, and LMS) Bismala and Manurung (2021) investigated student satisfaction with using e-learning as a distance learning method during the Covid-19 pandemic in Indonesia. The results showed that several factors need to be improved, such as materials presented in e-learning, interaction with lec-

turers, availability of facilities, and lecturers. Factors that should be maintained include flexibility, assessment of e-learning that is felt to be appropriate, the benefits of e-learning, and students' ability to allocate time. Maqableh and Alia (2021) identified students' satisfaction and the positive and negative aspects of online learning in India. Results show that students had several problems with shifting to online learning during the Covid-19 pandemic, such as technological, mental health, time management, and balance between life and education. The results also show that more than a third of the surveyed students are dissatisfied with the online learning experience. Results also reveal that distraction and reduced focus, psychological, and management issues are the most critical factors.

3. METHODOLOGY

In order to show the impact of Covid-19 on online classes, a short survey of students at the University of Slavonski Brod in the Republic of Croatia was used, entitled "Students' perception of the impact of Covid-19 on online studying".

The sample consists of 201 respondents (students) from Brod-Posavina County of the Republic of Croatia. The survey included students from the Faculty of Mechanical Engineering, Department of Social and human sciences, and Biotechnical Department. Apart from student and university status, there were no other restrictions on selecting respondents.

Independent variables are age, student status, and employment status. Dependent variables are interaction with teachers, materials from home, study time, adherence to ethics, and learning conditions.

A survey in the form of an online survey was used to collect data. The link to the online survey was sent by e-mail. Along with the link to the online survey, there were a few sentences of explanation related to the research and its purpose. The research was conducted during January and February 2022. The survey was conducted voluntarily, and 201 responses were collected.

Students' satisfaction was measured through the 15 questions: respondents filled in basic information about themselves in the first part. The second part included two-option (yes/no) questions. The third part includes the level of students' satisfaction with online studying. For these questions, a Likert scale

was used, and respondents evaluated the level of satisfaction with online studying with an interval from 1 to 5 (1- not satisfied at all; 2- slightly satisfied; 3- moderately satisfied; 4- very satisfied; 5- completely satisfied).

The statistical analysis of the results was done in the statistical program SPSS. Descriptive statistical parameters were calculated for all variables. A t-test was used to identify statistically significant differences between groups. In addition to the survey, scientific and professional articles, publications, and statistics were studied. In order to answer the specific research questions, the data obtained from this research will be presented and analyzed in the continuation of the paper.

4. RESULTS AND DISCUSSION

Two hundred one respondents participated in the questionnaire about the perception of students of the University of Slavonski Brod. The demographic characteristics of the sample can be seen in the following table.

Table 1. Sociodemographic characteristics of the respondents

Characteristics		Total	%
Age	< 30	164	81.59
	30 >	37	18.40
Student status	Regular	130	64.68
	Part-time	71	35.32
Student's employment status	Employed	74	36.81
	Unemployed	127	63.18

Source: author

Table 1. shows that the total number of respondents is 201, of which 81.59% are under 30 years old and 18.40% are over 30 years old. 64.68% are full-time students, while 35.32% are part-time students. The largest share, 63.18%, are unemployed, while 36.81% are employed students.

Table 2. Essential characteristics of the impact of Covid-19

Have you ever encountered online classes before the pandemic?	n	%
Yes	198	98.5
No	3	1.5
Did you feel isolated during online classes?		
Yes	174	86.87
No	27	13.13
Did you experience anxiety during online classes?		
Yes	110	54.73
No	91	45.27
Did you feel a decrease in focus during online classes?		
Yes	136	67.66
No	65	32.34
Did your motivation to study decrease during online classes?		
Yes	108	53.73
No	93	46.27
Did the effectiveness of learning less compared to face-to-face?		
Yes	95	47.26
No	106	52.74
Did planning of study schedule become difficult in online classes?		
Yes	77	38.31
No	124	61.69

Source: author

Table 2. shows that the majority, i.e., 198 respondents (98.5%), never before encountered online classes. The large majority felt isolated and felt a decrease in focus during online classes. Slightly more than half of the respondents felt anxiety, and their motivation to study decreased during online classes. Slightly less than half of the respondents said that the effectiveness of learning was not less online compared to face-to-face and that planning of study schedule did not become difficult in online classes. The following figure shows the level of satisfaction with interacting with teachers in a virtual environment (Figure 1).

Figure 1. Satisfaction with interaction with teachers in a virtual environment
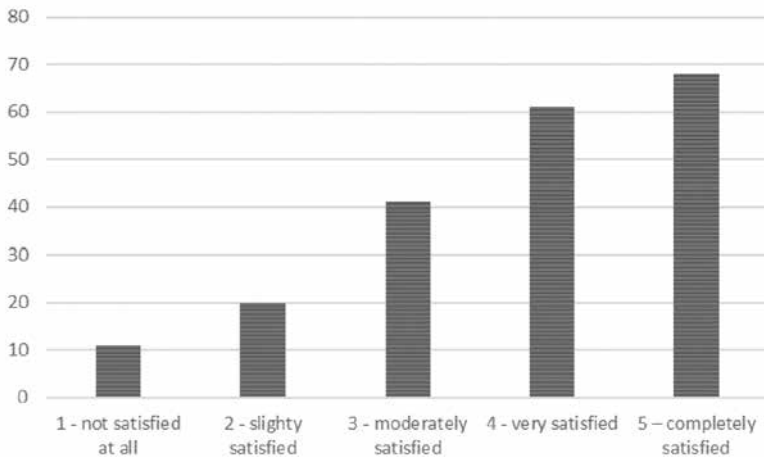
Figure 1. shows that the largest share of respondents (66.17%) is entirely and significantly satisfied with the interaction with teachers in the virtual environment. Only a small proportion of 5.47% is not satisfied at all. The following figure shows the level of satisfaction with access to teaching materials from home (Figure 2).

Figure 2. Satisfaction with access to teaching materials from home
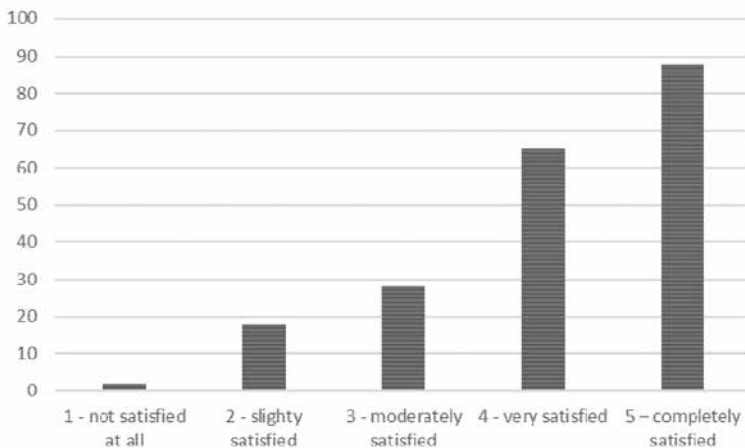
Figure 2. shows that the largest share of respondents, 76.11%, is entirely and significantly satisfied with access to teaching materials from home. Only a small

proportion of 1% is not satisfied at all. The following figure shows the level of satisfaction with increased study time due to online classes (Figure 3).

Figure 3. Satisfaction with increased study time due to online classes
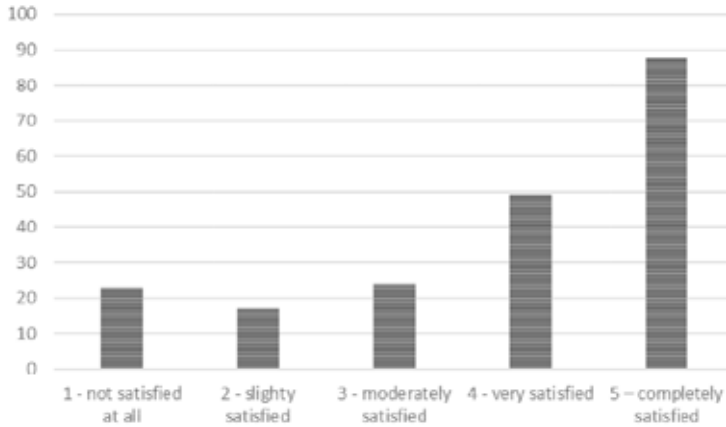
Figure 3. shows that 43.78% of respondents are delighted with the increase in study time, while 11.44% are not satisfied. The following figure shows the level of satisfaction with the mechanisms of adherence to ethics during the knowledge check due to online classes (Figure 4).

Figure 4. Satisfaction with the mechanisms of adherence to ethics during the knowledge check due to online classes
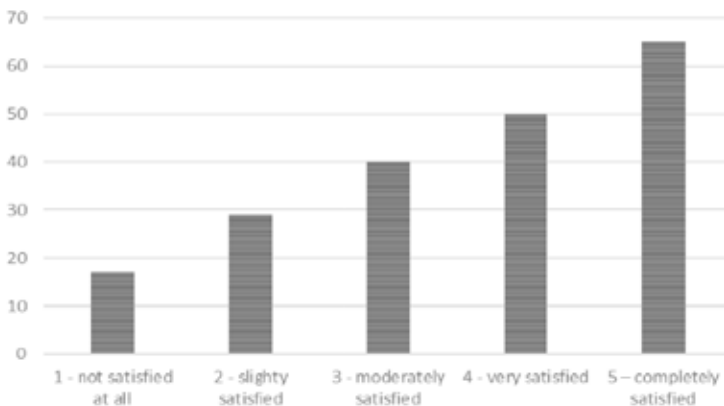
Figure 4. shows that 57.21% of the respondents are entirely and significantly satisfied with the mechanisms of compliance with ethics during the knowledge check due to online classes. In comparison, the small share of 8.45% is not satisfied.

The following figure shows the level of satisfaction with the provided conditions for quality distance learning in the accommodation where students live (Figure 5).

Figure 5. Satisfaction with the provided conditions for quality distance learning in the accommodation where students live
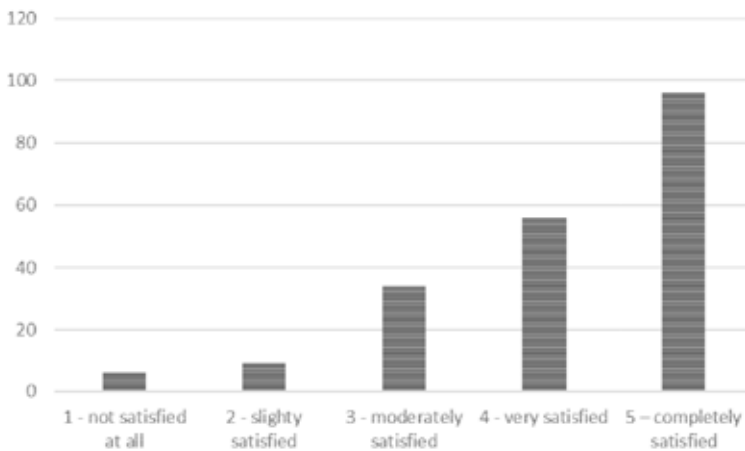
Source: author

Figure 5. A large proportion of respondents, 47.76%, are satisfied with the conditions provided for quality distance learning in the accommodation they are staying in. In comparison, a small proportion of 2.98% is not satisfied. The biggest problems are probably a good internet connection or a quality laptop, PC, or smartphone. These factors caused some additional problems with online teaching. The following table shows the basic statistical parameters (Table 3).

Table 3. Basic statistical parameters

Variable	M	Me	Mo	Min	Max	SD	Skew	KURT	STD.ERR
Interaction with teachers	3.77	4.00	5.00	1.00	5.00	1.18	-0.73	-0.33	0.08
Materials from home	4.09	4.00	5.00	1.00	5.00	1.01	-0.94	0.04	0.07
Time to study	3.80	4.00	5.00	1.00	5.00	1.38	-0.91	-0.47	0.10
Ethics	3.58	4.00	5.00	1.00	5.00	1.30	-0.52	-0.88	0.09
Learning conditions	4.13	4.00	5.00	1.00	5.00	1.04	-1.15	0.78	0.07

Source: author

Table 3. shows that respondents show the highest level of satisfaction with the provided learning conditions (M=4.13) and with the availability of materials for online learning (M= 4.09). In contrast, they show the least satisfaction with ethics when checking knowledge due to online classes.

The scale of each variable varies from 1 to 5, and it can be seen that the averages from 3.58 to 4.13 are average. That is, the respondents are moderately satisfied with online studying. The obtained value of Cronbach's alpha coefficient is .858. It confirms the consistency in the respondents' answers through different scales, which indicates that the reliability can be considered very good.

In order to examine whether there is a difference between the answers on the dependent variable concerning the independent variables, the T-test for independent samples was used. A T-test was performed to determine if there was a difference in the respondents' perception concerning the age of the respondents (Table 4).

Table 4. T-test considering student age

Variable	Category	M	t	df	p
Interaction with teachers	< 30	3.70	1.781	199	0.076
	30 >	4.08			
Materials from home	< 30	4.04	1.387	199	0.166
	30 >	4.29			
Time to study	< 30	3.85	0.900	199	0.368
	30 >	3.62			
Ethics	< 30	3.54	0.903	199	0.367
	30 >	3.75			
Learning conditions	< 30	4.12	0.211	199	0.832
	30 >	4.16			

SOURCE: author

Table 4 shows no statistically significant difference in any variable (p > 0.05). A T-test was conducted to determine whether there was a difference in the respondents' perception regarding the respondent's student status (Table 5).

Table 5. T-test considering student status

Variable	Category	M	t	df	p
Interaction with teachers	Regular	3.53	4.064	199	0.000
	Part-time	4.21			
Materials from home	Regular	3.90	3.550	199	0.000
	Part-time	4.42			
Time to study	Regular	3.73	-403	199	0.296
	Part-time	3.94			
Ethics	Regular	3.30	4.338	199	0.000
	Part-time	4.09			
Learning conditions	Regular	4.00	2.265	199	0.024
	Part-time	4.35			

Source: author

Table 5. a statistically significant difference between full-time and part-time students was found in interaction with teachers, materials from home, ethics, and learning conditions. At the same time, part-time students showed a higher level of satisfaction with all the mentioned variables. No statistically significant difference was found in the variable time for learning (p > 0.05). A T-test was conducted to determine whether there was a difference in the respondents' perception regarding the respondents' employment status (Table 6).

Table 6. T-test considering the student's employment status

Variable	Category	M	t	df	p
Interaction with teachers	Employed	4.19	3.980	199	0.000
	Unemployed	3.53			
Materials from home	Employed	4.35	2.852	199	0.004
	Unemployed	3.94			
Time to study	Employed	3.97	1.314	199	0.190
	Unemployed	3.71			
Ethics	Employed	3.87	2.495	199	0.013
	Unemployed	3.41			
Learning conditions	Employed	4.35	2.334	199	0.020
	Unemployed	4.00			

Source: author

Table 6. shows that a statistically significant difference was found between employed and unemployed students on the variables of interaction with teachers, materials from home, ethics, and learning conditions. At the same time, employed students showed higher satisfaction with all the mentioned variables. No statistically significant difference was found in the variable time for learning ($p > 0.05$).

Covid-19 has required universities (students and teachers) to adapt to a challenge and rapidly transition from traditional face-to-face teaching to distance learning. A review of previous literature shows that most universities/higher education institutions had no earlier experience with such a learning mode, so they first identified the problems faced during online learning and sought suggestions for overcoming them. So, many authors suggest introducing guidelines in future virtual classrooms because this experience offers an opportunity to prepare better higher institutions to deal with other or similar crises in the future. Society needs flexible and resilient education systems as we face unpredictable futures. Neuwirth et al. (2020) presented a series of propositions to help maintain and enhance the quality of college student engagement and activity in the virtual classroom in New York. Authors consider this may facilitate future discussions on creating best practice guidelines for asynchronous/synchronous virtual classrooms post the pandemic. Almazova et al. (2020) investigated the level of university teachers' readiness to implement e-learning during the Covid-19 pandemic in Russia. The analysis of the participants' answers helped to identify the main challenges and barriers experienced by university teachers and potential answers. Conrad et al. (2022) suggest that "to digitalize higher education successfully, institutions must redesign students' learning experience systematically and re-evaluate traditional pedagogical approaches in the online context. They also emphasized the necessity of establishing training programs and providing timely IT supports to help students address the technical challenges in the online learning environment." Smartphones are becoming an essential digital parameter, i.e., the future of technology, and currently is a transfer from laptops and PCs to mobile platforms. When analyzing online studies, it is essential to take the mobile platform, which will undoubtedly gain an increasing share.

5. CONCLUSION

Covid-19 has tremendously affected higher education systems in Croatia as in the world, forcing them to transform from face-to-face to online classrooms. The research analysis shows that students are delighted with all the variables of online studying. However, they show the highest level of satisfaction with the provided learning conditions and the availability of materials for online learning. In contrast, they show the least satisfaction with ethics when checking knowledge due to online classes. The analysis of hypotheses determines the following: According to the T-test, there is no statistically significant difference in the respondents' perception concerning the age of the respondents.

Consequently, hypothesis H1 is rejected. The age of students does not affect the perception of the impact of Covid-19 on online studying. According to the T-test, there is a statistically significant difference in the respondents' perception regarding the status of the respondents. A statistically significant difference was found between regular and part-time students on the variables of interaction with teachers, materials from home, ethics, and learning conditions. At the same time, part-time students showed a higher level of satisfaction with all the mentioned variables.

Consequently, hypothesis H2 is accepted. Student status affects the perception of the impact of Covid-19 on online studying. According to the T-test, there is a statistically significant difference in the respondents' perception regarding the respondents' employment status. A statistically significant difference was found between regular and part-time students on the variables of interaction with teachers, materials from home, ethics, and learning conditions. At the same time, employed students showed higher satisfaction with all the mentioned variables. Consequently, hypothesis H3 is accepted. A student's employment status affects the perception of the impact of Covid-19 on online studying.

In conclusion, it can be stated that students show a high level of satisfaction with the selected variables of online studying due to the effects of Covid-19, and a significant difference in perception exists among part-time and full-time students and among employed and unemployed students. On the other hand, students felt isolated and felt a decrease in focus during online classes. They also felt anxiety, and their motivation to study decreased during online classes.

The paper should contribute to analyzing the perception of studying due to the effects of Covid-19. The limitation of this research is that data was collected

from only one University in the country, which may limit the generalizability of its findings. This research can be a starting point for more detailed research - to include students and to conduct the survey in all universities in the Republic of Croatia. This study was limited to only five variables. Future research can investigate how other variables are related to student satisfaction. In addition, the teacher's perception of satisfaction could be included in future research.

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MODELS OF CRISIS COMMUNICATION ABOUT VACCINATION ON THE EXAMPLE OF THE COVID-19 PANDEMIC IN CROATIA

Gordana LESINGER, Ph.D.
Josip Juraj Strossmayer University of Osijek, Faculty of Humanities and Social Sciences Osijek

E-mail: glesinger@ffos.hr

Abstract

The word crisis describes the situation in which an individual, organization, or society finds itself and can have negative consequences. Crisis communication and crisis management were keywords in the public media space during the COVID-19 pandemic. They have typical characteristics of threat, time pressure, and insecurity, and the media played a crucial role in monitoring the crisis, healthcare, and the healthcare system. Crises are sudden and undesirable situations that systems deal with, and crisis communication with all target audiences is essential. Most often, crisis communication occurs through the media, and the emergence of the "infodemic" was another phenomenon faced by both the health system and the media. Crisis communication refers to the real-time exchange of information, advice, and opinion between professionals and people facing health, economic or social threats (WHO).

Moreover, in the crisis communication process, the communicator's expertise and credibility are essential for transparency and credibility in transmitting information. The Republic of Croatia faced crisis communication challenges during the COVID-19 pandemic. In the paper, we will analyze the crisis communication models on the example of communication about vaccination and vaccines and point out their good and bad sides.

Keywords: *crisis, crisis communication, health system, media system, COVID-19, vaccination*

JEL Classification: *D83, D89*

1. INTRODUCTION

Managing business activities every day is different from managing activities in crisis conditions. The threat, time pressure, and uncertainty are common to most crises (Kešetović & Toth, 2012). Many crises and accidents in the last few years have placed crisis communication in a strategically important place in companies or institutions (Tomić & Sapunar, 2006). The paper links crisis communication with the Croatian health system.

The paper aims to point out the importance of crisis communication and to investigate the examples of successful crisis communication during the CO-VID-19 crisis, and the research questions are:

a) What is a crisis?

b) What are the essential characteristics of a crisis?

c) Why is successful crisis communication important?

d) What was communication like during the COVID-19 crisis?

e) What were the relations with the media during the COVID-19 crisis?

The paper has four chapters: Introduction, Literature Review, Research Problem and Methodology, and Conclusion. The introduction reveals the subject of the paper, the aim of the paper, the research questions, the hypothesis, and the structure of the paper. The literature review summarizes the primary findings from the literature reviewed and is divided into the following chapters: Conceptual definition of crisis, Characteristics of crisis, and Crisis communication. The research problem and methodology list and define the methods used in the research and the writing of the paper. The conclusion contains the answers to the research questions and the explanation of the research conducted.

2. DEFINITION OF CRISIS

The crisis is one of the most frequently used words in everyday communication today. Individuals use it to describe their personal, private situations; even more often, it describes the state where a society or organization finds itself. This state can have potentially adverse consequences (Kešetović & Toth, 2012). A crisis refers to an unexpected, unstable, and undesirable situation in social, political, or economic processes that threatens the values or systems that support the life of a community (Ilakovac & Mikrut Vunjak, 2022: 4).

A crisis can occur in all areas, in numerous forms, and experts have difficulty in conceptually defining a crisis. A crisis is unplanned and unwanted, lasts a specific time, has different endings, and can be partly influenced (Tomić & Sapunar, 2006). Namely, there are clearly defined ways of dealing with a crisis, and one of the most critical factors in crisis management is proactive communication management (Prašović Gadžo, 2021:84). A vital tool in crisis management is quality communication with the public before, and during and after the end of the crisis. It is necessary to plan and form a team for crisis communication and define the roles and tasks of each team member. It is necessary to define the method of communication with all the stakeholders and use all communication channels (Klepić et al., 2020:13).

3. CRISIS COMMUNICATION

Kešetović and Toth (2012) wrote that crisis communication has two meanings. The first meaning is crisis communication as information. During a crisis, there is a need to collect and send information that the crisis team gathers to understand the crisis and plan activities. Another meaning is crisis communication, a strategy in which crisis communication is used to improve stakeholder relations. Communication in a crisis is not like everyday communication; therefore, it requires preparation and knowledge of the essential elements of crisis communication.

Regarding the implementation of crisis communication, Powers and colleagues state four essential elements: 1) the ability to establish empathy towards the public, 2) the expertise and credibility of the communicator of the announcement, 3) transparency, openness, and sincerity in providing information, and 4) dedication and availability of the communicator of the announcement (Kešetović & Toth, 2012:112). In crisis communication, strategies are used that respond to the crisis and protect the organization's reputation. Experts in crisis communication choose a strategy that will best preserve the organization's reputation (Tomić & Milas, 2007).

It is known that crisis communication is not the type of communication that we usually use in work and life. How one communicates in crises clearly defines how successful a particular institution is in overcoming the crisis or what potential dangers the institution is exposed to during the crisis. The public expects and wants to have complete information about what is happening. They want

communication in real-time (real-time info) (Prasovic Gadžo, 2021:73). For effective communication during a crisis, the trust of the vulnerable public in the sources from which they receive critical information is crucial but also trust in the institutions and organizations that manage the crisis and communicate various instructional information, adaptation information, and reputational information. Since citizens are exposed to global communication sources, owing to which they perceived different ways and models of managing the consequences of the pandemic throughout Europe and the world, they were able to compare Croatian efforts with the experiences and practices of other countries at the level of perception (Jugo et al., 2020:349).

4. CRISIS COMMUNICATION DURING THE COVID-19 CRISIS

The crisis caused by the COVID-19 pandemic was a big challenge for everyone, both states and institutions. This crisis revealed both the bad and the good sides of the system. It can be said that Croatia found a way to successfully fight this global health crisis, which was significantly contributed to by the cooperation of national and local authorities, civil protection headquarters, professional working groups, and other experts, and the citizens of the Republic of Croatia (Trut, 2022:5). Accurate and continuous information disseminated to the public in crises is essential for people's psycho-physical health in order to keep them up to date with the events. However, it is also important not to spread misinformation so as not to cause panic among already distracted people. Crisis communication should be two-way, which means it is essential to allow people to ask questions and give clear and tailored answers to the questions. Any unclear communication can lead to a communication misunderstanding, which can also cause a crisis, but it can also increase the intensity of the crisis and its duration (Vincek, 2021: 8-9). When it comes to the level of trust in the information published in the media and other communication channels, the analysis shows that the highest level of trust is in the information received from friends and acquaintances, followed by traditional electronic media - radio and television. The lowest level of trust is in the ubiquitous social media. These results speak of the critical role of traditional media in informing citizens during the crisis, i.e., the importance of credible and verified sources, but also the progress of Croatian media in effectively monitoring crises and substantive adaptation to

the new situation (Jugo et al., 2020: 365). In today's dynamic environment, social networks represent a potent, influential, and necessary tool for establishing, developing, and maintaining quality communication, including those in crises (Klepić et al., 2020: 13).

A large part of the problems Croatia faced during more than two years of the epidemic was predicted by the scenario elaborated in the Disaster Risk Assessment for the Republic of Croatia, a document the Government of Croatia adopted in November 2019. The document recognizes the risk of the emergence of epidemics and pandemics in the Republic of Croatia, which is elaborated with a flu pandemic scenario that is almost identical to the development of the new coronavirus epidemic.

The development of the events predicted by the pre-crisis scenario immensely helped in the context overview of the overall picture of the coronavirus epidemic in the Republic of Croatia, and thus the adoption of timely measure decisions.

- As there are always circumstances that no single scenario, no matter how complex, can predict, the civil protection system has shown readiness and responded professionally and efficiently even in such situations.
- During the long and uncertain fight against the coronavirus, cooperation at all levels, from the local to the national level, including all sectors, components of the civil protection system and international organizations, and the citizens of the Republic of Croatia, was of crucial importance for the success achieved (Trut, 2022:6).

5. MEDIA COMMUNICATION IN THE ERA OF THE COVID-19 CRISIS

The media play an essential role in informing the public. Due to the rapid spread of the virus and the high death rate caused by the coronavirus, people relied heavily on the media during social isolation and search of verified information. The coronavirus posed new challenges to journalism. The media play a fundamental role in shaping the crisis because providing accurate information from a reliable source is crucial for this pandemic (Tejedora, 2020: 2). The COVID-19 crisis has affected various social domains, including media and journalism. Since the beginning of this health crisis, the news has been a valuable

resource for citizens. Studying the dynamics of information consumption is extremely important because of its ability to transform the media system and its frequency in democracy (Casero-Ripollés, 2020: 1). The COVID-19 pandemic highlights the basic need for reliable and credible information. In this context, the social role of journalism is more crucial than ever, and practicing this profession has become even more challenging (Vuillemin, 2020:1). Periods of health crises, such as the outbreak of the COVID-19 pandemic, place a significant burden on the media in regularly informing people. Theory suggests that when a message is published through the media, the most important thing is not what is said but how it is said. The media could mitigate or accentuate the crisis, depending on the *frames* (Ogbodo et al., 2020: 257). Due to limited movement, it turned out that the Internet played a crucial role in media consumption during quarantine. Social networks took the first place among the online platforms most frequently consulted by citizens for the availability of information. According to Twitter, information about the pandemic and conversations related to the topic led to a 23% increase in total daily active users, reaching an overall level of 164 million users in the quarter. The news check saw significant growth at that stage. In particular, the peak of media consumption coincided with the first social distancing measures. It increased in correspondence with government communications (Tejedor et al., 2020:2.) The media is known as one of the most important means of communication, especially in times of crisis. During this crisis, the mass media informed the citizens and informed them about the situation. The media can calm people down, encouraging them to act positively, but vice versa. It can also create chaos (Shalvee & Sambhav, 2020: 3787). The context in which the coronavirus crisis takes place is very diverse and complex. Traditional and social media are integral parts of public perception and opinion, and they can initiate changes in behavior and thus influence the spread of the pandemic (Gozzi et al., 2020: 2). People who relied more on mainstream media to get information about the coronavirus crisis tend to think positively about the government communication strategy (Moreno, 2020: 11). The rise of digital technology and new digital environments has created and established new channels of information flow (..), however, traditional media often publish reliable, verified facts, helping people to make informed and knowledgeable decisions - this is a crucial prerequisite for the functionality of democratic societies (David & Sommerlad, 2020: 5)

6. RESEARCH PROBLEM AND METHODOLOGY

The paper deals with crisis communication models on the example of the COVID-19 pandemic in Croatia, that is, the infodemic. As the paper was written under the auspices of the Croatian Science Foundation's project entitled "Influence of the Internet and Social Internet Networks on Attitudes and Decisions About Vaccination", within which we investigated attitudes about vaccination, the author dealt with the media influence on attitudes about vaccination and media communication during the COVID-19 pandemic. Consequently, the author is interested in how it was communicated during the crisis period, the pandemic year. As the pandemic had several so-called waves, each wave had different communication approaches and communicated differently with the public. For the project itself, within the analysis of the media discourse, four papers were published under the titles: Infodemic in the First and second wave of the Pandemic: a comparative analysis of the media content of Croatian portals, Indecision about vaccines amid the COVID-19 pandemic: insights from a focus group study in Croatia, Infodemic or the excessive amount of misinformation published about the COVID-19 virus pandemic, and Social Media Vaccination Discourse: Preliminary Notes on Theory, Method, and Ethical Challenges. Following the above, and as it is about the finalization of the project, this order is a kind of recapitulation of communication through the media during the COVID-19 pandemic.

Another phenomenon accompanied the pandemic itself, so, along with the pandemic, an infodemic was also observed, i.e., an excessive amount of incorrect information about the pandemic itself, which resulted in additional efforts by communicators to suppress incorrect information, i.e., additional crisis communication of information published on social media, which sometimes took up the media space of traditional media. As the author dealt with this phenomenon in previous papers, this paper will also deal with the infodemic as a form of crisis communication.

At the very beginning of the paper, research questions were asked. Through the theoretical part of the paper, it was answered what a crisis is, what the essential characteristics of a crisis are, and why successful crisis communication is important. The research will answer how communication was done during the COVID-19 crisis and what the relations with the media were like during the COVID-19 crisis.

a) institutional analysis of the infodemic

The infodemic marked communication in the pandemic. Infodemic is the rapid and far-reaching spread of original and incorrect information about specific problems. The word is a portmanteau of "information" and "epidemic". It is used as a metaphor to describe how misinformation and misinformation can spread like a virus from person to person and affect people like a disease. This term, coined in 2003 by David Rothkopf, became famous in 2020 during the COVID-19 pandemic (Wikipedia, 2023). The World Health Organization defines an infodemic as "an excess of information, including false or misleading information, in digital and physical environments or landscapes during an acute public health event". An infodemic could be an overabundance of information. However, in most cases, this is exacerbated by rumors (unverified information), disinformation (false information), and inaccurate information (deliberate attempts to change beliefs, emotions, trust, and community cohesion by falsifying information, sources, popularity, and other aspects of the information environment) (World Health Organization, 2022). COVID-19 has led to a parallel pandemic of disinformation that directly impacts lives and livelihoods worldwide. Falsehoods and misinformation have proven deadly and sowed confusion about life-saving personal and policy choices. Two policy briefs analyze the types of viral disinformation helping to drive the pandemic and investigate how individuals, the news media, internet communications companies, and governments are responding to the contamination of the information ecosystem. UNESCO's Sector for Communication and Information publishes this research as part of its ongoing work to promote freedom of expression and universal access to information which offer rich food for thought about actions undertaken to combat the disinfodemic, assess the potential risks associated with restrictive measure and provide recommendations on how responses to the crisis can be improved to align to international human rights standards on access to information, freedom of expression and privacy (UNESCO, 2023).

Social media and platforms were a key channel for spreading disinformation about COVID-19. (…) The "infodemic" and disinformation surrounding COVID-19 have highlighted the challenges to overcome and the need to equip the EU with new tools to improve responses to disinformation in the future (europarl.europa.eu, 2023). Infodemics and related processes change behavior to produce adverse effects or " infodemic harm." The World Health Organization states in its analysis that information overload and voids, rumours, misinfor-

mation, and disinformation generate infodemic harm. Individual categories of harm include psychological (e.g., health information-seeking anxiety) and physical (e.g., using fake COVID-19 cures that result in poisoning). Other types of harm are due to reduced vaccination uptake and other protective measures. Signals of problems in the context of an infodemic include the following:

- Content: increased false narratives, rumors, and stories about a current health situation.

- Context: a mismatch between information-seeking behavior (including levels of trust and the channels in which information is sought) and information-posting behavior and availability.

- Behavior: infodemic techniques, including fake experts and manipulated media websites that seed or promote false narratives; coordinated inauthentic behavior that creates more incredible popularity of false narratives than usual; and the spread of false narratives into community discussions.

- Risk: the degree to which an incident is or could affect a community combined with the numbers potentially affected by the incident gives an estimate of relative risk. Nationally, regionally or globally, infodemics are generally at scale: a conspiracy rumor that is rarely repeated is not a signal of a problem in the context of an infodemic, but the spread of that rumor into the wider popular narrative and negatively affecting health behavior is. Scale is also relative: issues that do not affect many people may significantly harm a smaller community (WHO, 2022).

The WHO COVID-19 Research Database brings an article by Adekoya and Fasae (2021). Social media and the spread of the COVID-19 infodemic in which it is stated that this study also showed that the infodemic associated with COVID-19 is managed by confirming the source of information before sharing it and trusting information from reliable sources. The result of this research will contribute to the body of knowledge on social media applications, fake news, and the spread of the COVID-19 infodemic. Infodemic is a disaster in the health sector. The spread of the infodemic can mislead people, losing trust in government, health providers, and regulatory authorities. This study will help social media users know how to properly manage the infodemic during a pandemic or any health-related situation. This study is novel as it approaches fake news from a COVID-19 perspective. Very few articles emanate from developing countries in this area (pesquisa.bvsalud.org, 2023). In conclusion, the European Science-Me-

dia Hub is a portal of the European Parliament, which contains links related to the infodemic and several other misinformation related to COVID-19. Bringing scientists, journalists, and policymakers together: to communicate better sound science to all, the mentioned portal was established within a chapter entitled "Tackling COVID-19 Infodemic: fact-checking and debunking initiatives".

b) the first wave

Infodemic is a new term that came into everyday use due to the emergence of the coronavirus, i.e., the COVID-19 pandemic. The accelerated circulation of information mediated by social networks has affected a multitude of inaccurate, untrue, and harmful information that has confused the public, which has caused an infodemic or excessive spread of false information and news in public space. The scientists themselves contributed to this noise in the communication channels. They communicated daily through traditional media channels and social networks, and their statements, in a hybrid genre, were transmitted through traditional media channels. Through the paper, the author gave a cross-section of the media monitoring of the infodemic in the Republic of Croatia and neighboring countries through a descriptive media content analysis. The obtained descriptive results show that most processed articles cited scientists and that the scientists themselves did not write the articles, and there is no doubt about them. In further analyses of the given parameters, the results show that the articles do not deal with the source of the virus but the dangers of spreading the virus and the vaccine against it. In conclusion, we can say that the writing on specific topics was very colorful, which contributed to confusion and misinterpretation of the statements given. Moreover, following the above, we can conclude that excessive amounts of information related to the new coronavirus, especially the incorrect ones, can seriously harm the implementation of activities that contain the spread of the virus.

The results obtained from the descriptive analysis showed that most of the articles covered in the analysis cited scientists. However, the scientists themselves did not write the articles, so there is still doubt about the scientists. A remote analysis of the given parameters showed that the articles do not deal with the source of the virus but with how the virus spreads and with the invention and existence of a vaccine against it. The analysis further shows that the analyzed members did not deal with measures to suppress the virus, such as masks and keeping a distance. The amount of data on the immunity of the

sick is insufficient. As a conclusion of this part of the analysis, we can say that writing about specific topics related to COVID-19 was very colorful, which contributed to additional ambiguity and misunderstanding, as well as misinterpretation of the analyzed statements.

c) the second wave

The research analyzed the infodemic phenomenon based on descriptive media analysis and quantitative analysis of the content of texts that appeared on several of the most popular portals in Croatia during the first and second waves of the pandemic and compared those two waves. The goal was to analyze how the pandemic and infodemic were presented on the visited media portals. The comparative analysis of pandemic-related content on Croatian web portals during the first two waves enabled some insights into the media coverage trends of the infodemic. Even though scientists are quoted, not many articles are written by scientists or MDs, and scientific positions are often questioned, even though there is significant variability in how topics are represented. This situation can be compared to other research contributions, for example, on leveraging media and health communication strategies in overcoming the infodemic, that accentuate the confusion brought about by conflicting positions of scientists and MDs or various interpretations of topics. Unfortunately, the overflow of information can harm the implementation of activities for controlling the spread of the virus. However, the Internet, as the place of diffusing information, can also help public health policies realize the desired outcomes. The results can also be compared to research that shows that the virus's rapid spread contributed to the online discourse on it and how themes in online texts changed with the adoption of social distancing measures and non-pharmaceutical interventions.

A comparative analysis of pandemic-related content on Croatian web portals during the first two waves provided some insights into the trends in media coverage of the infodemic. Although scientists are cited, there are not many articles written by scientists or Doctors of Medicine and scientific points of view are often questioned. However, there is significant variability in the way the topics are represented.

d) analysis of domestic media

Fake news and misinformation made communication difficult during the pandemic and confused the public, but this can change if citizens prefer news

with credible sources instead of unverified information (Tportal, 2022). In 2020, scientists Gallotti, Valle, and Castaldo wrote an article entitled "Assessing the risks of 'infodemics' in response to COVID-19 epidemics", and stated that waves of misinformation precede the spread of Covid-19. Within the study, they analyzed more than 100 million tweets from around the world, and as the number of infected people grew, reliable information became more dominant. They state that, at the beginning of the pandemic, communication was characterized mainly by the production of informational noise and even misleading or false information, which in turn generated waves of unreliable and low-quality information with potentially dangerous impacts on society's ability to adapt and quickly adopt norms and behaviors that would effectively contain the spread of the pandemic. Furthermore, spreading false or misleading information can prevent the timely and effective adoption of appropriate behavior and public health recommendations or measures.

On the one hand, people were faced with a lack of effective therapies and suitable countermeasures, and on the other hand, they were exposed to an infodemic threat. Low-quality sources are more attractive to many because they sound more convincing, thanks to typically clear messages. Like epidemics, infodemics could be considered outbreaks of false rumors and unreliable news with unexpected effects on social dynamics. Moreover, this can significantly increase the spread of the epidemic. In conclusion, they say that the spread of the infection led people to look for relatively more reliable sources (Tportal, 2020).

With the arrival of the pandemic in Croatia, it happened that the majority of people followed the content, what the politicians said, i.e., what was said on television, because that content had a personal impact on their lives and the Headquarters, i.e., the key institutions failed to tell the citizens at the very beginning - this is a new disease, information will change both globally and locally over time (Tportal, 2022).

e) analysis of foreign media

Deutsche Welle launched the "Fighting the Infodemic: Media in Times of Covid-19" project. The Croatian media also had a label in which they made it clear that they were fighting against the infodemic but were not united in a joint project. The fight against the infodemic resulted in portals for checking the accuracy of information. The Ministry of Culture and Media and the Agency for Electronic Media published a public call for grants to establish media fact-

checking in 2023. The call is financed from the next-generation EU instrument. The goal of the call is to strengthen society's resistance to misinformation by reducing the amount of disinformation, misinformation, and false news in the public space, strengthening information reliability and safety when consuming media content and using social networks, strengthening the quality of journalism and credible reporting, and strengthening media literacy. This shows that the Republic of Croatia intends to use joint projects to combat inaccurate information published in the media. Reuters Institute reports an article by scientists Altayrasmus, Nielsen, and Fletcher from the University of Oxford called "Quantifying the "infodemic": People turned to trustworthy news outlets during the 2020 coronavirus pandemic" from 2022, in which they state: "In conclusion, we found that online news consumption increased during the 2020 pandemic and that more trustworthy news outlets benefited the most from the increase in web traffic. In the UK, more trustworthy news outlets benefited the most from the increase in Facebook engagement, but in other countries, both trustworthy and untrustworthy news outlets benefited. Despite widespread public concern about the reliability of online news and real problems with various kinds of misinformation, untrustworthy news outlets accounted for a small minority of web traffic to news sites in 2020. In the UK and Germany, untrustworthy news outlets also accounted for a minority of Facebook engagement. However, they accounted for almost a quarter of all engagement with news outlets in the US and France. The WHO was proper that people sought considerable information during the pandemic. While some of it was unreliable, especially on Facebook, our results suggest that most were from trustworthy news outlets.

The Guardian states, "The vast majority of Covid-19 anti-vaccine misinformation and conspiracy theories originated from just 12 people, a report by the Center for Countering Digital Hate (CCDH)" CCDH, a UK/US non-profit and non-governmental organization, found in March that these 12 online personalities they dubbed the "disinformation dozen" have a combined following of 59 million people across multiple social media platforms, with Facebook having the most significant impact. CCDH analyzed 812,000 Facebook posts and tweets and found that 65% came from disinformation. Vivek Murthy, US surgeon general, and Joe Biden focused on misinformation around vaccines this week as a driving force of the virus spreading. They conclude that although platforms have since taken measures to remove any posts and even remove three of the 12 from one platform, the CCDH is calling on Facebook and Instagram,

Twitter, and YouTube to completely deplatform the disinformation dozen they believe are dangerous and instrumental in creating vaccine hesitation at a crucial moment in the pandemic (theguardian.com, 2022). In the article "Disinformation campaigns: "Lies can turn deadly or threaten the stability of societies," mis- and disinformation can be dangerous and harmful because it creates a false reality. If a disinformation campaign is successful, thousands or even millions of people believe in a false reality. Such lies can turn deadly or threaten the stability of society. For example, in the COVID-19 disinformation campaigns, some dissuade the public from wearing masks, claiming that the virus is not airborne, some claim unverified cures, and some dissuade the public from vaccinating. This may lead to severe consequences, including death. Disinformation also threatens freedom of thought and the right to democratic participation by polarizing citizens against their beliefs and processes of democratic institutions. This distorts free and fair elections and can lead to violence. Disinformation also undermines human rights, especially in cases where disinformation actors target minority groups, religious beliefs, societal inequalities, or gender-related topics (akademie.dw.com, 2021). The COVID-19 crisis has shown that reliable information is vital, as stated in the article "DW Akademie joins Free Press Unlimited campaign "Together for reliable Information" - a campaign by Free Press Unlimited stresses the importance of free media and verified information. "The Corona crisis is not only a medical phenomenon but also a media phenomenon with the viral emergence of corona-related disinformation and the rapid spread of fake news," said Carsten von Nahmen, Managing Director of DW Akademie. "It is therefore particularly worrying that the challenges and risks for journalists are increasing dramatically due to the COVID-19 crisis and that many quality media outlets have to fight for survival themselves," he concludes.

7. CONCLUSION

Since a crisis is unexpected and cannot be planned, there is also a conceptual definition because no two are alike. The author was interested in how it was communicated during the crisis period, the pandemic year. Crisis communication during the COVID-19 pandemic was a big challenge for everyone, revealing the system's bad and good sides. It can be said that Croatia found a way to fight this global health crisis successfully.

What required additional skills in crisis communication is the phenomenon that accompanied the pandemic itself - an infodemic characterized as an excessive amount of incorrect information about the pandemic itself, which resulted in additional efforts by communicators to suppress incorrect information. The infodemic was characterized by information published on social media, which sometimes also occupied the media space of traditional media. Considering that during crises, the public expects and wants complete information about what is happening, the media played an essential role in informing the public because people searching for verified information relied heavily on the media. Given that the media constantly followed the development of events and transmitted numerous statements from both experts and the public, we can say that the crisis communication of the COVID-19 pandemic took place through the media, and in the process of crisis communication to the media and the public, the expertise and credibility of the communicator was necessary for transparency and credibility in transmitting the information.

Numerous studies, analyzed in the research part of the paper, have shown that people relying more on mainstream media to get information about the COVID-19 crisis tend to have a favorable opinion about the government communication strategy. However, the enormous growth of digital technology and new digital environments, especially during the pandemic, created and established new channels for the flow of information. Despite the digitization of communication, traditional media often publishes reliable, verified facts, helping people make informed and knowledgeable decisions. The accelerated circulation of information mediated by social networks has affected a multitude of incorrect, untrue, and harmful information that has confused the public, which has caused an infodemic or excessive spread of fake news in the public space aggravated by rumors (unverified information), disinformation (false information) and incorrect information (intentional attempts to change beliefs, emotions, trust, and community cohesion by falsifying information, sources, popularity and other aspects of the information environment)

A comparative analysis of pandemic-related content on Croatian web portals during the first two waves provided some insights into the trends in media coverage of the infodemic. Although traditional media tried to quote scientists, the infodemic found fertile ground in social networks where online crisis communication took place and could not have been managed in any way.

Although almost all traditional media had their pages on social networks, alternative sources were crucial for numerous information. During crisis communication, efforts were made to avoid such phenomena, so social networks developed algorithms for identifying and eliminating fake news. Numerous portals for checking media facts were also developed in parallel to the above. What was detected as a critical communication problem was the lack of recognition that this was a new disease that had hit the whole world and that we were unfamiliar with the course of the crisis. Hence, the communication strategy had to be adapted to the new circumstances. Precisely because of this non-transparency, we can say that the public sought numerous alternative information to find their way in the emerging crisis period.

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ESTIMATION OF MAINTENANCE COST IN ELEMENTARY SCHOOLS OF PRIMORJE-GORSKI KOTAR COUNTY, CROATIA

Ksenija TIJANIĆ ŠTROK, Ph.D.
University of Rijeka, Faculty of Civil Engineering

E-mail: ksenija.tijanic@uniri.hr

Abstract

For quality education, the school buildings' condition is an important aspect; therefore, it is essential to maintain schools continuously. The challenge, however, is maintenance funding that is limited and often insufficient. Also, current cost estimates are imprecise, and data on elementary school and maintenance costs are restricted. More accurate maintenance cost plans would give better insight into budget allocation and help manage costs. Considering the stated, this paper's goal includes the elementary school database creation with insight into maintenance costs historical data, based on which a more accurate cost estimation model will be developed. For work purposes, a database includes data for 31 schools. Data were collected from elementary school representatives and the schools' financial reports. The data were statistically processed, while regression analysis was used for modeling. The coefficient of determination (R^2) and mean absolute percentage error (MAPE) were used to evaluate the regression model's accuracy. As a research result, it was determined that it is possible to collect historical data on costs and, based on them, to develop prediction models for the observed period with satisfactory accuracy. Variables that can be used to estimate maintenance costs include information on the founder type, the classrooms area, the work shift number, and the period for which cost data were collected. The research is limited to Primorje-Gorski County. The period for which historical cost data was collected is also a limitation. In future research, it is proposed to expand the database and cover a larger geographical area. Trying other estimation methods, such as neural networks, is also recommended, potentially resulting in lower cost estimation errors than regression analysis. The results of this research can help school institutions and public authorities plan costs and make maintenance decisions.

1. INTRODUCTION

Schools have an educational (and upbringing) purpose; therefore, they are fundamental and indispensable institutions in the social community. How well the school will fulfill its purpose and function depends mainly on the building condition in which education is carried out (Xaba, 2012; Yong & Sulieman, 2015; Tijanić et al., 2019; Teixeira et al., 2022; Tijanić Štrok et al., 2023). For the school buildings' condition to support quality education, it is necessary to maintain them (Tijanić Štrok, 2021) adequately. School building maintenance includes all those activities carried out to preserve, protect and improve schools to serve the desired purpose and functions during their lifetime (Izobo Martins, 2014; Tijanić Štrok, 2021).

Regarding accounting, school building maintenance is usually divided into current and investment maintenance. Current maintenance includes performing works undertaken to prevent damage caused by the building use or to remove such damage. They consist of inspections, repairs, and taking preventive and protective measures. On the other hand, investment maintenance includes the execution of construction-craft works intending to improve the building use conditions in the building operation phase. It often requires large financial resources (Tijanić & Car-Pušić, 2019).

In addition to maintenance, capital projects that include investments in constructing and equipping new schools are also carried out (Primorsko-goranska županija, 2020).

The maintenance as mentioned above (and capital projects) of school buildings are carried out by public bodies, i.e., the founders (state, county, city, municipality) and the school itself (under the leadership of the principal). Public bodies provide funding based on a financial plan stating the necessary maintenance funds. Funds are withdrawn from the local and/or state budget. However, funding is limited and very often insufficient for all stated maintenance needs (Tijanić Štrok, 2021; Tijanić Štrok et al., 2022). Due to the limited budget, the need for management and more efficient maintenance and funds spend-

ing is very pronounced (Tijanić Štrok, 2021). Effective maintenance, according to Tijanić Štrok (2021), implies proactive and high-quality implementation of maintenance activities while minimizing the consumption of resources as well as the resulting costs. As time passes and schools age and deteriorate, the facilities' condition causes the maintenance cost to rise. This indicates that planning and optimal allocation of a limited budget is a significant and worthwhile goal (Chang Sian et al., 2010).

According to the literature (Državni ured za reviziju, 2018; Tijanić et al., 2019; Tijanić Štrok, 2021), no in-depth research has been conducted in the Republic of Croatia that deals with the maintenance costs of elementary school institutions, and there is no broader database on maintenance costs. Elementary school maintenance is often neglected, uncoordinated, and expensive (Vlada Republike Hrvatske, 2012; Državni ured za reviziju, 2018; Tijanić Štrok et al., 2019; Tijanić Štrok, 2021). Cost estimates are imprecise (Tijanić Štrok, 2021). In practice, the planned maintenance costs often do not correspond to the costs spent. The difference between the planned and total realized costs usually arises due to changes in the scope of individual planned works, as well as, in some cases, the complete abandonment of certain planned works, and also the appearance of maintenance works that were not foreseen (Tijanić Štrok, 2021). According to Tijanić Štrok (2021), the average error in planning expenditures for maintaining elementary schools in Croatia is over 40%. Such a significant estimation error can negatively affect decision-making about the hierarchy of maintenance tasks and the effective use of the maintenance budget (Tijanić et al., 2019). Therefore, estimation models should be designed and developed to give the smallest possible estimation error. More precise maintenance cost plans would give better insight into budget allocation and help manage costs.

In theory (Chang Sian et al., 2010; Krstić, 2011; Tijanić & Car-Pušić, 2019; Plebankiewicz & Grącki, 2023), maintenance costs can be explained by independent variables such as building age, area, number of floors, number of shift and so on. Future maintenance costs can be predicted by applying mathematical models (Krstić, 2011; Gudac Hodanić, 2019; Obradović, 2022; Plebankiewicz & Grącki, 2023). The regression analysis has proven to be a good option when estimating the costs of different types of facilities in the literature (Krstić, 2011; Li & Guo, 2012; Kim et al., 2018; Car-Pušić et al., 2020; Tijanić Štrok, 2021; Obradović, 2022; Plebankiewicz & Grącki, 2023).

However, the literature on estimating maintenance costs through regression, exclusively for school buildings, is limited. Selected studies include the work of Kim et al. (2018), who created a study using multiple regression analysis to determine a model for estimating the cost of maintaining education facilities (including elementary and secondary schools) in Florida, USA. The results showed that their model could, to a certain extent, predict the ratio of education building maintenance costs based on data on the total building area, the building location, and the vulnerability to floods. However, the model explained 35.5% of maintenance costs, which according to Moore (2014), indicates a medium to low level of model reliability.

In her doctoral dissertation, Tijanić Štrok (2021) developed a satisfactory accuracy regression model for estimating the costs of maintaining elementary and secondary schools in the area of the city of Rijeka (Republic of Croatia). It has been shown that maintenance costs can be predicted to a certain extent based on sanitary areas and based on information on planned maintenance costs. However, the results are limited and less applicable since data from only eight schools were used to model development. A more expansive database is needed for the results to be as representative and applicable as possible (Tijanić Štrok, 2021).

Considering all the above, this paper aims to develop a model for estimating elementary school buildings' maintenance costs using mathematical methods (regression analysis). The model is based on a database of elementary school buildings and historical data on the actual maintenance costs. The purpose of the model is to enable a quick, simple, and structured estimation. The goal is to create a database with a large data sample for the results to be as reliable as possible. The following research hypotheses are put forward:

- It is possible to create a database on elementary school buildings from the area of Primorje-Gorski Kotar County, with insight into historical data on maintenance costs;
- Based on the created database, it is possible to develop a mathematical model for estimating the elementary school buildings' maintenance costs with satisfactory accuracy;
- Applying the developed model will reduce inaccuracy in maintenance cost estimation;

- Applying the developed model will facilitate essential maintenance decisions, contributing to increased efficiency in maintenance.

This work is a continuation of the research presented in the dissertation by Tijanić Štrok (2021) and the papers of Tijanić Štrok et al. (2022) and Tijanić Štrok et al. (2023).

The work is organized as follows. Chapter 1 is the opening chapter, in which the motives for conducting the research are stated, the main points from the literature review are highlighted, and the goal and hypothesis of the research are highlighted. Chapter 2 describes the applied methodology in detail with all the necessary descriptions and explanations. In Chapter 3, the obtained results are presented and discussed. The last Chapter 4 presents the drawn conclusions.

2. METHODOLOGY

To achieve the research goal, i.e., to develop a model for estimating the elementary school buildings' maintenance costs, a methodological framework consisting of several steps was designed and is shown in Figure 1.

Figure 1. The methodological framework of the research
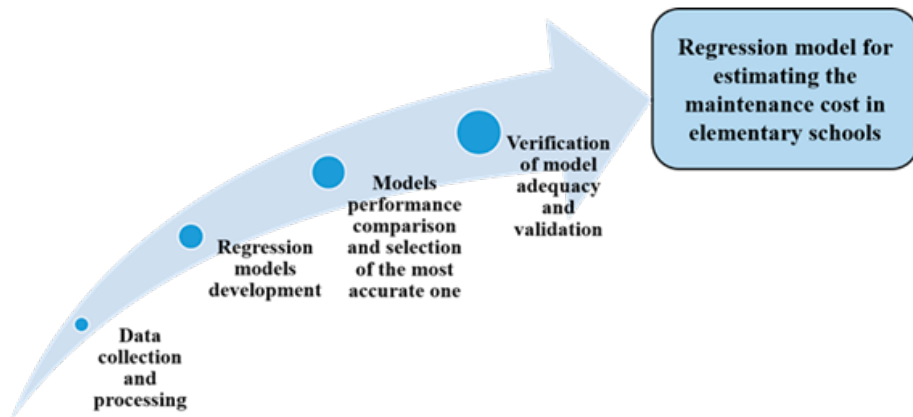
Source: own study

2.1. Data collection and processing

The initial step involves creating a database to be processed and used for modeling. The goal is to collect data from over 30 samples because then it is considered a large sample, and it is considered that it can be used to obtain sufficiently reliable, representative, and statistically significant results (Walpole, 1968). The database includes elementary schools from Primorje-Gorski Kotar County, selected as an area of interest due to its size, a sufficient number of schools to create a representative sample and data availability. A total of 57 public elementary schools operate in this county. The source of data was documentation from representatives of the schools: the founders (City of Rijeka) and the Ministry of Education, as well as financial statements of the schools in which all receipts and expenses of the business were reported by category and annually. The data collected include the following categories: annual maintenance costs (materials, parts, and services for current and investment maintenance), type of founder, year of construction, total indoor area, areas of all rooms separately, number of employees, number of shifts, number of students, the number of class divisions. The reference period of the last ten years, i.e., from 2013, was observed. The area of interest is the elementary school building as a unique unit. Therefore, only schools operating in one school building are included in the research since data on maintenance costs from financial statements are written in a unified manner. From them, it is impossible to distinguish and distribute costs by building if the school operates in more than one. If the school operates in several buildings, there is also a problem with the data on the construction year and the type of heating, which can be different from building to building. There are 33 elementary schools in Primorje-Gorski Kotar County operating in one building.

Since data is collected on costs incurred in the past, it is necessary to convert them into a corresponding present value. The value of money changes over time, which should by no means be ignored. According to the literature (Čulo, 2010; Narodne novine, 2017; Obradović, 2022), all collected costs from the past were accrued with an interest rate of 3% according to Hrvatska narodna banka (2022).

After the database was created, it was statistically processed and analyzed.

2.2. Regression models development

The second step in the research is the development of mathematical prediction models. An approach based on regression analysis was chosen because such models are widely used in cost estimation (Krstić, 2011; Li & Guo, 2012; Kim et al., 2018; Car-Pušić et al., 2020; Tijanić Štrok, 2021; Obradović, 2022; Plebankiewicz & Grącki, 2023). They are very effective due to a well-defined mathematical approach, the possibility of explaining the connections between independent and dependent variables, and the size and strength of this mutual influence (Sodikov, 2005; Obradović, 2022). A multiple regression approach was used to develop a model for estimating elementary school maintenance costs. The multiple regression model can be represented by expression (1) (McClave et al., 2005; Čengija, 2015):

$$Y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + ... + \beta_k x_k, \qquad (1)$$

The meanings of the symbols in the formula are as follows:
- Y_i – dependent variable whose future values are predicted by the model,
- $\beta_0, \beta_1, \beta_2, ..., \beta_k$ – regression coefficients that determine the contribution of a single independent variable in the model,
- $x_1, x_2, ..., x_k$ – independent variables based on the predicted dependent variable (Bahovec & Erjavec, 2009; Čengija, 2015).

In this case, the dependent variable represents the average annual maintenance costs in the reference period, while all other categories of data represent potential independent variables.

The stepwise method was used to select the dependent variables that will be the composition of the model, which is most often used in cost estimation models (Krstić, 2011; Čengija, 2015). This method ensures the inclusion of only statistically significant variables in the model, and it works as described in Tijanić Štrok (2021).

In the regression analysis, the statistical hypothesis testing procedure was carried out. This procedure determined whether and how reliable the available data are and whether they support the set assumptions depending on the level

of statistical significance. The value used when selecting important model variables and when testing hypotheses was statistical significance or p-value, which was determined at a level of less than 5%. If the p-value is less than 0.05, the null hypothesis is rejected, and the alternative hypothesis is accepted.

The following statistical hypotheses of this research were established:

- H_0: $\beta1 = \beta2 = \ldots = \beta k = 0$, all regression coefficients in the model are equal to zero, i.e., none of the independent variables has a statistically significant relationship with the dependent variable.

- H_A: $\beta1 = \beta2 = \ldots = \beta k \neq 0$, not all regression coefficients equal zero, i.e., some independent variables have a statistically significant relationship with the dependent variable.

Regression models were developed in Microsoft Excel using the statistical add-in Real Statistics. It automatically independently sets the significant variables of the model depending on the magnitudes of correlations between variables and statistical significance by selecting the stepwise option.

When creating an estimation model, how specific data are expressed also plays a role; therefore, in this work, transformation functions were used in which costs were expressed in several different ways (original cost form, 1/ original cost form, second root of costs, third root of costs, natural logarithm of costs) to check whether this affects the model accuracy.

2.3. Models performance comparison and selection of the most accurate one

The developed models were compared concerning the magnitude of their prediction error. The models' error was measured using the coefficient of determination (R^2) and Mean Absolute Percentage Error (MAPE). The R^2 is a statistical measure that checks the general suitability of the prediction model, i.e., it tells how much of the changes in the experimental values of the dependent variable are explained by the obtained model (Serdar, 1966; Obradović, 2022). R^2 values belong to the interval [0, 1] (Petruseva et al., 2016), and the model is more representative the closer R^2 is to 1.

MAPE is a measure of prediction accuracy and is defined by the following formula (Tijanić et al., 2020) (2):

$$MAPE = \frac{1}{N} \sum \left| \frac{\text{actual value - predicted value}}{\text{actual value}} \right| (\%). \quad (2)$$

Models with R^2 over 0.640 are considered to describe the model well (Moore, 2014). In cost forecasting models, MAPE values up to 30% are acceptable (Tijanić et al., 2020). Considering the obtained values of the model's accuracy indicators, the model with the highest value of R^2 and the lowest value of MAPE goes into further detailed consideration.

2.4. Verification of model adequacy and validation

Whether the resulting selected model is valid was checked in several different ways.

First, it was established whether (multi)collinearity among the dependent variables is present in the model. Collinearity occurs when independent variables are highly correlated (k < −0.70, k > 0.70). When there is collinearity, the regression analysis results can be unreliable, and the estimation of the regression coefficients becomes unstable. Collinearity was checked by observing the value of the Variance Inflation Factor (VIF), which, if it is over 4, indicates a level of correlation that should be paid attention to (Tharu, 2019).

The generated residuals were also analyzed to check the adequacy of the model. Residuals represent variations that the developed model cannot explain, i.e., the differences between the predicted value of the variable and the actual value. The main assumptions of the regression model are that the residuals are normally distributed and that there is homoscedasticity of the residuals, i.e., residuals have constant variance at every point in the model (Astivia & Zumbo, 2019). The distribution of the residuals was checked using the Shapiro-Wilk test, while homoscedasticity was checked using the Breusch-Pagan test, both at a significance level of 5% (p<0.05).

Validation of the model was also carried out, for which two test samples of schools that did not participate in the development of the model were used. The

developed model was implemented on the test sample, the estimated and actual costs were compared, and the model error was expressed through MAPE.

2.5. Regression model for estimating maintenance cost in elementary schools

If all these tests indicate acceptable values, it can be said that the obtained model is adequate and can be used to estimate maintenance costs in elementary schools in Primorje-Gorski Kotar County.

3. RESULTS

The created database consists of 31 sets of data for elementary schools in Primorje-Gorski Kotar County, for which it was possible to collect the necessary data. Complete data were collected for 94% (31 of 33) schools operating in one building from the surveyed area. Descriptive statistics of the potential independent variables (X) of the maintenance cost estimation model and the dependent variable (Y) are shown in Table 1.

Table 1. Descriptive statistics of the database

Variable	Mean	Median	Mode	Standard Deviation	Max	Min
X_1	1.68	2.00	2	0.48	2.00	1.00
X_2	82.03	63.00	122	40.78	203.00	21.00
X_3	2,920.66	3,000.00	-	1,197.35	5,170.00	900.00
X_4	464.15	330.00	288	470.04	1,950.00	0.00
X_5	1,033.97	1,131.00	-	437.48	1,860.00	135.00
X_6	90.15	37.00	0	122.59	600.00	0.00
X_7	56.93	51.00	36	23.09	131.35	28.00
X_8	47.39	46.67	22	21.25	90.00	0.00
X_9	38.81	24.00	18	46.91	209.95	0.00
X_{10}	32.94	26.00	50	18.25	66.00	4.50
X_{11}	60.90	47.05	0	49.03	215.00	0.00
X_{12}	70.78	64.00	-	38.14	176.96	18.00
X_{13}	124.95	113.00	200	70.86	300.00	21.00
X_{14}	899.70	919.71	-	518.10	2,199.03	70.00
X_{15}	50.87	48.00	49	16.73	93.00	23.00
X_{16}	1.29	1.00	1	0.46	2.00	1.00
X_{17}	8.19	9.00	10	1.89	10.00	5.00

X_{18}	347.14	333.00	-	215.27	919.80	30.40
X_{19}	17.96	16.67	12	8.16	39.80	7.33
Y	11,895.46	10,508.87	-	5,821.21	25,308.04	4,018.70
Meaning of variables						

X_1 – Type of founder: county (1), city (2)	X_{12} – Library area (m2)
X_2 – Age of the building concerning the year 2022	X_{13} - Area of sanitary facilities (m2)
X_3 – Total indoor area (m2)	X_{14} – Area of other spaces (m2)
X_4 – Area of the sports hall (m2)	X_{15} – Number of employees
X_5 – Classroom area (m2)	X_{16} – Number of work shifts
X_6 – Cabinet area (m2)	X_{17} – Reference period
X_7 – Area of administrative premises (m2)	X_{18} – Average number of students in the reference period
X_8 – Area of the teachers' lounge (m2)	X_{19} – Average number of class departments in the reference period
X_9 – Space area for professional associates (m2)	
X_{10} - Kitchen area (m2)	Y – Average annual maintenance costs in the reference period (€)
X_{11} – Area of the dining room (m2)	

Source: own study

The database consists of 19 possible independent variables and one dependent variable, the average annual maintenance costs in the reference period. The reference period refers to the years' cost data collected for a building. All variables, except X_1 (type of founder), are quantitative on a numerical scale. X_1 represents a qualitative variable on a nominal scale. As such, the X_1 variable cannot be used within the regression analysis; therefore, for these purposes, it is coded into numerical values (Glen, n.d.), and following the example of the authors Kim et al. (2018) and Gudac Hodanić (2020).

The average annual costs were obtained by converting them into a present value, then adding them by year and dividing them by the corresponding reference period. Since the costs were initially expressed in kuna (HRK), they were converted into euros (€) at the exchange rate of 7.53450.

Several models, single and multiple, were developed, and in Table 2, only those that gave an R^2 value greater than 0.640 and a MAPE less than 30% are presented.

Table 2. Regression models for estimating average annual school maintenance costs

Model	The nature of the Y variable	Significant variables (p<0,05)	R^2	MAPE (%)
Model 1	Original form	X_1, X_5, X_{16}, X_{17}	0.721	24.11
Model 2	1/original form	X_1, X_5, X_{16}, X_{18}	0.744	22.93
Model 3	Second root	X_1, X_5, X_{16}, X_{17}	0.749	21.68
Model 4	Third root	X_1, X_5, X_{16}, X_{17}	0.755	21.39
Model 5	Natural logarithm	X_1, X_5, X_{16}, X_{17}	0.759	21.17

Source: own study

Considering the results and several independent variables were obtained in the models with a statistically significant relationship with the dependent variable (p<0.05), the null hypothesis can be rejected and the alternative hypothesis accepted.

Next, only the model that gave the best results according to the indicators will be analyzed, namely *Model 5*, within which the maintenance costs are expressed using the natural logarithm (ln). Within this model, significant independent variables include the following:

- X_1 – a type of founder,
- X_5 – classroom area,
- X_{16} – number of work shifts,
- X_{17} – reference period.

The MAPE value of the selected model is 21.17%, while $R^2=0.759$. Therefore, the R^2 value can be interpreted as follows: 75.9% of the model can be explained by predictor variables, and the remaining 24.1% can be attributed to unknown variables or inherent variability.

Details of *Model 5* are presented in Table 3.

Table 3. Details of Model 5

			Multiple R		0.8715		
			R^2		0.7594		
			Adjusted R^2		0.7224		
			Standard Error		0.2586		
			Observations		31		
			AIC		-79.2952		
			AICc		-75.7952		
			SBC		-72.1253		
			ANOVA	Alpha	0.05		
	df	SS	MS	F	p-value	sig	
Regression	4	5.4906	1.3726	20.5188	9.83E-08	yes	
Residual	26	1.7393	0.0669				
Total	30	7.2299					
	coeff	std err	t stat	p-value	lower	upper	vif
Intercept	9.0545	0.3112	29.0932	0.0000	8.4147	9.6942	
X_1	-0.9192	0.1112	-8.2657	0.0000	-1.1478	-0.6906	1.2523
X_5	0.0006	0.0001	4.8942	0.0000	0.0003	0.0009	1.2962
X_{16}	0.3821	0.1096	3.4856	0.0018	0.1568	0.6074	1.1472
X_{17}	0.0784	0.0269	2.9128	0.0073	0.0231	0.1337	1.1560

Source: own study

According to the obtained results, the equation of the developed *Model 5* reads:

$$9.0545 - 0.9192X_1 + 0.0006X_5 + 0.3821X_{16} + 0.0784X_{17} \tag{3}$$

Concerning the assigned values of variables X_1, it is evident from the given formula (3) that the estimated maintenance costs are higher by a certain amount for schools founded by the county.

Based on formula (3), the estimated maintenance costs for the observed schools can be obtained. A comparison of the estimated values obtained by *Model 5* and the actual values is shown in the graph in Figure 2.

Figure 2. Cost values estimated by *Model 5* compared to actual costs
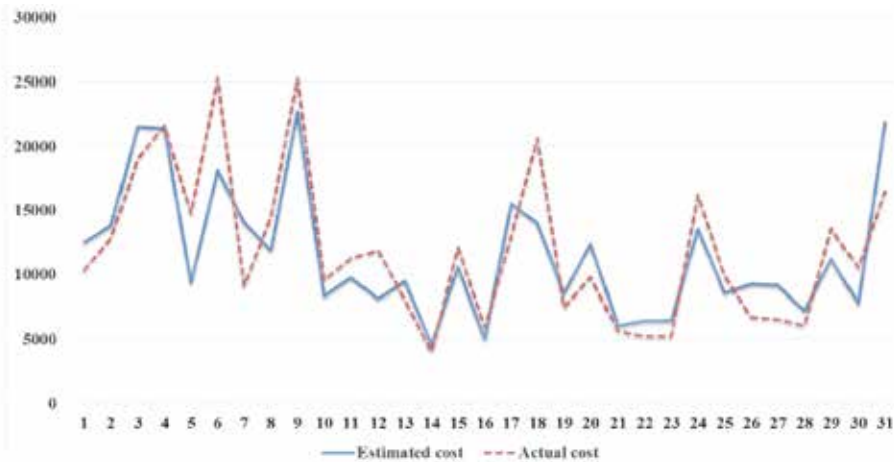
The average estimation error is, therefore, 21.17%, according to MAPE. If we look at the MAPE for each school individually, the distribution of the error size is visible in the graph in Figure 3.

Figure 3. MAPE distribution by elementary schools
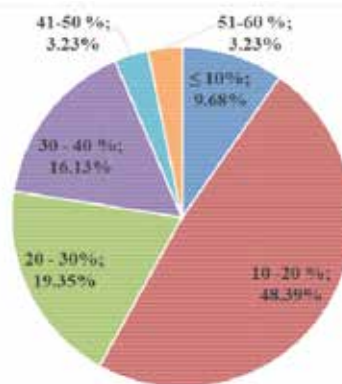
The developed model gives a 10-20% prediction error in almost 50% of cases. In as many as 77.42% of cases, this error is up to 30%, considered acceptable. It is essential to know and consider that the average annual costs are estimated using the model. Given that these are average costs, the actual costs can

be lower, but also higher, than this average value. Therefore, it is possible that in a particular year, the actual costs in the future will be close to the estimated value with something bigger MAPE (>30%).

The presented model's errors are smaller than the current error in estimating school maintenance costs, which, according to Tijanić Štrok (2021), is about 40% (MAPE).

Next, model verification, the last step in its construction and an essential part of regression model design is conducted. Verification gives final approval to the model, confirming that it can predict the variable of interest (Obradović et al., 2023). In other words, it is checked how the built-in model adequately explains the average annual costs for elementary school maintenance. This was done through the statistical checks below.

Looking at Table 3, it is evident that there is no serious (multi)collinearity among the significant independent variables, as the VIF ranges from 1.1472 to 1.2962.

Checking the distribution of the resulting residuals using the Shapiro-Wilk test shows that they are normally distributed (Table 4).

Table 4. Shapiro-Wilk test

Shapiro-Wilk Test			
W-stat	p-value	alpha	normal
0.953327	0.192724	0.05	yes

Source: own study

The Breusch-Pagan test verified the homoscedasticity assumption, and the following results were obtained, shown in Table 5.

Table 5. Breusch-Pagan test

Breusch-Pagan Test				
LM	df	p-value	alpha	homoscedastic
3.517472	4	0.261464	0.05	yes

Source: own study

The model was validated by implementing it in school buildings that did not participate in its development. The test sample consists of two secondary school institutions for which it was possible to collect the necessary data. If the model proves to be good for them as well, it means that in addition to elementary schools, it can also be used to estimate maintenance costs in secondary schools. The sizes of the independent and dependent variables of the test sample are presented in Table 6.

Table 6. Sizes of independent and dependent variables for the schools' test sample

School	X_1	X_5	X_{16}	X_{17}	Y
1	county (1)	1,014.00	1	8	14,002.28
2	county (1)	805.00	1	7	14,818.71

Source: own study

By including the data from the two test samples in formula (3), the values of the average annual maintenance costs are obtained for them, shown in Table 7.

Table 7. Comparison of estimated and actual maintenance costs for a test sample of schools

School	Estimated costs	Actual costs	MAPE (%)
1	17,224.92	14,002.28	23.01
2	14,045.34	14,818.71	5.22
average			14.11

Source: own study

Validation of the model on both test samples showed a satisfactory accuracy of 23.01% and 5.22%, respectively. Therefore, it can be concluded that the model can also be used in secondary schools in the observed county.

Considering all the presented results, it can be concluded that the developed regression model for estimating the average annual maintenance costs of school buildings is adequate and suitable for use in elementary schools in Primorje-Gorski Kotar County.

The developed model's advantage is reflected in its application's simplicity because a small number of variables are required for cost estimation. Also, sig-

nificant variables for cost estimation can be determined relatively simply and quickly. Using the model, as a result of the estimation of maintenance costs, the value of the average annual maintenance costs is obtained, which are the same for each year of maintenance in the observed reference period, so that the costs can be planned for more extended periods. Using the model opens up new possibilities in planning the necessary budget for school maintenance, thus making maintenance more efficient. A more accurate maintenance budget provides insight, helps distribute money, and helps control and monitor these costs.

The first and primary limitation of the model is its applicability to school buildings in Primorje-Gorski Kotar County. Although the model adequacy check showed very good results, checking them on a larger sample of data from other areas of the Republic of Croatia is recommended, so it can also be used in other regions. Also, since the database consisted only of schools operating in one building, the application is exclusive to such institutions. The limit is also related to the years over which school maintenance costs are estimated. The period for which the data was collected ranges from 5 to 10 years, and considering that, it is possible to estimate the costs for a maximum period of 10 years. It is also recommended that the value of the independent variables used to estimate the costs should not exceed the limits of the independent variables used to determine the regression coefficients because more significant deviations can be obtained from the actual costs that will appear (Krstić, 2011; Tijanić Štrok, 2021; Obradović, 2022). A limitation is also the small number of test samples for validation. Although satisfactory results were obtained, checking them on a larger data sample is always recommended.

Considering the highlighted limitations, it is recommended to expand the research to the entire territory of the Republic of Croatia and develop a model that will not have a regional character and potentially give better results. For this reason, the database should be continuously expanded and updated.

It is also recommended to perform modeling using more complex techniques, such as Soft computing methods, among which neural networks are predominantly used, for future value estimations. Neural networks can potentially result in smaller errors in the estimation of maintenance costs compared to regression analysis (Tijanić & Car-Pušić, 2019; Car-Pušić et al., 2020; Tijanić et al., 2020; Tijanić Štrok, 2021).

4. CONCLUSION

The topic of this paper is estimating the costs of maintaining elementary schools in Primorje-Gorski Kotar County, Republic of Croatia. The work resulted in fulfilling the set research goal and establishing the veracity of the set hypotheses, as presented below;

- It is possible to create a database on elementary school buildings from the area of Primorje-Gorski Kotar County with insight into historical data on maintenance costs. A database was created with data from 31 elementary schools, which was used for statistical analyses. A dependent variable is maintenance costs, and independent variables are characteristics of elementary school institutions. Cost data were collected for a period of 5 to 10 years.

- Based on the created database, it is possible to develop a mathematical model for estimating elementary school buildings' maintenance costs with satisfactory accuracy. Several different regression models were developed to estimate maintenance costs, which differ in how the costs are expressed within them. The model in which the costs were expressed using the natural logarithm proved to be the most accurate, and it was analyzed in more depth. The type of founder, the area of classrooms, the number of work shifts, and the reference period for which data on costs were collected were determined as statistically significant variables based on which the researched costs can be estimated. The error of the selected model was expressed using the coefficient of determination (R^2) and the mean absolute percentage error (MAPE), whose obtained sizes are considered satisfactory for this type of assessment. The analysis of the obtained model showed reliable results for all parameters, and the validation showed that the model could also be used in secondary schools.

- Applying the developed model will reduce inaccuracy in maintenance cost estimation. According to the available data from the literature review, the error obtained is about two times smaller than the current size of the error in estimating maintenance costs. In practice, one always wants to achieve the most accurate financial plan possible, so any contribution to increasing accuracy is essential.

- Applying the developed model will facilitate essential maintenance decisions, contributing to increased efficiency in maintenance. The results of this research can help school institutions and public bodies in planning costs and making maintenance decisions. Applying the developed model makes planning and calculating maintenance costs simple, quick, and structured. In this way, not only would the losses be reduced, but it would also be possible to create a mitigation strategy to prevent losses based on the analysis results.

There are some research limitations, such as regional orientation, limited database, and reference period for which the data were collected. In future research, it is recommended to expand the database and try other assessment methods to obtain even better results, for which there is undoubtedly room given the obtained R^2 and MAPE sizes.

6. ACKNOWLEDGMENTS

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PUBLIC ENTREPRENEURSHIP: LINKING CHILDREN'S SAFETY AT CROSSWALKS WITH TRAFFIC BEHAVIOR

Mirjana ŠIMUNOVIĆ, mag.ing.aedif
Josip Juraj Strossmayer University of Osijek,
Faculty of Civil Engineering and Architecture Osijek

E-mail: msimunovic@gfos.hr

Ivana ŠANDRK NUKIĆ, Ph. D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Civil Engineering and Architecture Osijek

E-mail: isandrknukic@gfos.hr

Irena IŠTOKA OTKOVIĆ, Ph. D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Civil Engineering and Architecture Osijek

E-mail: iirena@gfos.hr

Abstract

Through implementing innovative ideas created by various experts and supported by policymakers, public entrepreneurship becomes a way of dealing with the challenges of modern life. Among others, the benefits of public entrepreneurship can be achieved in spatial planning. Traffic fatalities are an increasing problem, and especially worrying is the fact that traffic accidents are the most common cause of death of children and the young in Croatia, as well as worldwide. Child pedestrians exhibit a specific behavior in traffic, which makes them a vulnerable traffic group. However, when designing pedestrian infrastructure, their needs and behavior are often neglected, as the primary focus is usually on the purely technical requirements of the traffic infrastructure. Therefore, the paper aimed to analyze the potential public entrepreneurship in spatial planning in terms of the innovative measures for increasing traffic safety which

would, besides technical requirements, take into account also pedestrian characteristics. The chosen methodology has relied on qualitative research methods used to create a relevant theoretical framework and the case study of possible reconstruction of the intersection, designed to protect the most vulnerable traffic participants. Considering the results of theoretical research on children's behavior at pedestrian crossings, the suggested intersection reconstruction uses design measures for the spatial separation of the vehicle-pedestrian conflict and for calming the dynamic characteristics of the incoming flow of vehicles. The main limitation of the case study is the focus on only one intersection. However, innovations are usually tested gradually, so authors find the study results satisfactory to suggest possible improvements in traffic safety measures at pedestrian infrastructure. As such, the findings are relevant to engineering and organizational scholars and since they comply with the global safety philosophy, they also carry significant implications for the general public. Future research should further develop these innovative ideas.

Keywords: *public entrepreneurship, planning, spatial planning, traffic safety, vulnerable road users*

JEL Classification: *L31, R4, M14, O18*

1. INTRODUCTION

Walking is the fundamental, oldest, most widespread, most social, and environmentally acceptable form of human movement (Šimunović & Ćosić, 2015: 3). Pedestrians are people of different ages, genders, physical endurance, and disabilities who walk individually or in groups and who perform their daily duties by walking (Legac et al., 2011: 270).

The main advantage of walking is that the pedestrian does not endanger himself or others during his movement (Šimunović & Ćosić, 2015: 3). Walking has modest requirements in terms of transport infrastructure, i.e., it only requires a suitable pedestrian area for the safe movement of pedestrians. In addition to the numerous advantages of walking, there are also several disadvantages. The main one is the slow speed of walking (Šimunović, 2022: 16). Walking speed varies from person to person, and, according to the literature, it is 2-7 km/h, which does not correspond to the measured values in the field, especially for vulnerable groups of pedestrians (Ištoka Otković, 2021: 15). older adults, children, pregnant women, and people with disabilities certainly have a lower

speed of movement than other pedestrians, but it is usually them being entirely dependent on walking (Legac et al., 2011: 272; Šimunović & Ćosić, 2015: 3).

According to the OECD's Road Safety Annual Report for 2022 (Road Safety Annual Report, 2022: 10-48), traffic volumes increased in 2021 compared to 2020., and pedestrian road deaths decreased by 22.7 %. Such a decrease is the result of significant efforts to increase traffic safety. However, because traffic accidents are still the most common cause of death of children, this manuscript's research goal is to contribute by raising a scientific discourse on the topic and suggest a potential innovative solution regarding pedestrian safety.

Among the 33 countries surveyed, 23 have either adopted a new strategy for 2030 or are working on it. Many explicitly mention the Safe System approach or Vision Zero (Road Safety Annual Report, 2022: 10-48). Vision Zero represents the long-term safety plan of EU Member States by 2050 (White Paper European Commission, 2011, 2.5. (9); NN 86/2021). It is a philosophy in which no traffic fatalities or serious injuries will occur. The idea as such was conceived in Sweden in 1994, after which it spread throughout Europe and the world as a universal vision of safe traffic and a multinational safety project (Tingvall & Haworth, 1999: 14). To achieve Vision Zero, it is necessary to change the paradigm and be innovative in several aspects, one of them being adapting roads and ensuring a higher level of safety for children and other vulnerable traffic users (Dekra, 2019: 5; Šimunović, 2022: 50).

Due to all of the above, this paper aims to create a relevant theoretical framework through which the change of focus from exclusively technical requirements of the transport infrastructure to the needs of children-users of the transport infrastructure would be explored. The authors start from the assumption that such a massive change in thinking, in which technical requirements remain, of course, *conditio sine qua non*, but first come to the needs of users, their safety, character, and specificity of behavior, is an example of public entrepreneurship worth investigating. In addition to the literature review, the lack of existing knowledge is supplemented by their case analysis in the local context.

2. METHODOLOGY AND METHODS USED

For this investigation, a qualitative research methodology has been chosen because qualitative research is inductive and seeks to understand processes, events, meanings and experiences in specific social frameworks (Mohajan,

2018). Qualitative scientific research is considered adequate because it occurs in a natural environment and enables the researcher to develop knowledge from high involvement in real experiences (Creswell, 2009). To enable this, qualitative research usually relies on several research methods (Denzin & Lincoln, 2005).

Respecting the above, the research presented by this paper has been carried out in two phases. In the first phase, the research of secondary data sources was carried out by applying the scientific method of analysis of relevant literature, the scientific method of synthesis to systematize the data collected, as well as the scientific methods of inductive and deductive reasoning, especially for the interpretation of the collected data. In this way, a theoretical framework was created to consider the topic further.

In the second research phase, the scientific method of a case study has been applied. A case study is considered empirical research that investigates in detail a contemporary phenomenon ("case") within its real context and thus contributes to its understanding and raises awareness of potential implications (Yin, 2014: 16). Such a consideration corresponds to the purpose of this paper – to study the real data at a specific road intersection regarding the potential increase of children's traffic safety.

3. PUBLIC ENTREPRENEURSHIP IN URBAN PLANNING

Joseph Schumpeter, the "father of entrepreneurship", defines entrepreneurship as creating innovation, which is the basis for economic growth and development (Tkalec, 2011: 37). Although entrepreneurship as defined in the 19th century, the emergence of entrepreneurship and entrepreneurial activities goes back much further in history (Westhead & Wright, 2013). The earliest entrepreneurial ventures are related to the emergence of trade and exchanging goods for survival (Škrtić & Vouk, 2006).

The notion of entrepreneurship certainly implies the launch of new business ventures through creative and innovative ideas of people based on identified needs in society (Ojugbele et al., 2022: 192). Therefore, it can be said that the general description of entrepreneurship is that it is related to innovation, creativity, launching a new business, or developing new ideas (Klein et al., 2010: 2).

Innovative ideas can be various, from new technological ideas (new technology, new products, and/or services) to new management ideas (new procedures, policies, and organizational forms). Innovations can also be a new public service, public organization, or work procedure within public administration or a social system (Fohim, 2019). Sometimes, new ideas arise in a particular setting; in other instances, a new idea is adapted or even borrowed from another setting and then applied in the entrepreneur's context. Accordingly, an innovative idea is any idea or practice the relevant adoption unit considers new (Roberts, 1992: 3; Roberts, 2006: 5).

Not all new ideas succeed, but the entire process of developing a new idea and linking the idea to a need, problem, or concern in public entrepreneurship usually follows several phases (Roberts, 2006: 5):

1. initiation or creation;
2. design phase - translates the idea into a more concrete and tangible form (such as a position paper, a prototype, or a model);
3. implementation - the new idea is tested in practice to ascertain how well it functions;
4. institutionalization - the new idea becomes accepted in practice.

Entrepreneurship also includes many skills and qualities, such as the ability to take risks, efficiently gather and exploit available resources, identify needs in society and think imaginatively (Palanivelu & Manikandan, 2015: 8). It is precisely the skill of recognizing the needs of society that are crucial for public entrepreneurship.

Public entrepreneurship could be described as the creation of a new or innovative idea, followed by the design and implementation of an innovative idea into the practice of the public sector. Recent research (Liddle & McElwee, 2019: 6) suggests that public entrepreneurship represents a compelling strategic response to environmental turbulence, and entrepreneurs are the initiators and protectors of an innovative idea as it moves through time.

The concept of public entrepreneurship became an extremely popular topic of research in the 1980s after Eugene Lewis, in his book "Public Entrepreneurship: Toward a Theory of bureaucratic political power: the organizational lives of Hyman Rickover, J. Edgar Hoover, and Robert Moses" showcased public ventures of three individuals and presented them as public entrepreneurs who created,

designed and implemented innovative ideas in the public domain for the benefit of society. Namely, Hyman Rickover was an American physicist and admiral who led the nuclear submarine development program, J. Edgar Hoover was an American law enforcement officer who founded the FBI, and Robert Moses was an American urban planner who carried out infrastructure projects necessary for the development of parks and highways in New York (Bernier, 2014: 258).

These entrepreneurs have profoundly changed their organization's capabilities in the US public sector and achieved incredible results, even in conflict cases. Mentioned and similar examples are noteworthy because they illustrate the emergence of conditions that create a favorable climate for new activities, thus paving the way for the emergence of strong entrepreneurs (Bernier & Hafsi, 2007: 5-6).

By studying such entrepreneurial ventures of individuals, it is clear that public entrepreneurship has been used for many years in the world. However, in Croatia, public entrepreneurship is a relatively new phenomenon that appeared in the middle of the last decade and is, therefore, poorly developed (Vidović, 2013: 2). The specific, transitional circumstances of recent Croatian history and the numerous consequent changes in Croatia caused insecurity and mistrust of citizens towards many social structures and their participants, which influenced the late development of public entrepreneurship in Croatia (Baturina, 2017: 82).

A complete understanding of public entrepreneurship in Croatia is still not present in politics and among the general public. This is the key obstacle to its development, as in other Central and Eastern European countries (Galera, 2016). Further support (financial and social) is needed to develop public entrepreneurship as a new practice (Baturina, 2017: 96).

Evidence from developed countries suggests that the responsibility for public entrepreneurship advancement lies on the public authorities. However, that support itself is not enough, and for real results, networking is needed in terms of public and private subjects cooperation (Mommaas & Janssen, 2008). This Dutch paper on public entrepreneurship in spatial planning recognizes that the local government should facilitate and support spatial development to mobilize new-public–private structures that would stimulate innovation. It would be the only proper response because new spatial-economic challenges require a much more proactive spatial policy, and the local government units usually lack professional knowledge.

Such a theoretical framework complies with the understanding of the authors of this paper, who strongly believe that the triple helix model is the right way of achieving innovation in general and in public entrepreneurship situations. The case study in this paper's end substantiates that innovative results might be achieved with effective university-industry-government relations and cooperation. Everyday challenges of modern life and changes in the social structure have led to the development and concretization of public entrepreneurship in various activities. The challenges in spatial planning require public proposals of innovative ideas from numerous social and/or technical sciences experts who can contribute to society's needs by working together. In traffic safety, the number of traffic fatalities, excessive vehicle speeds, and disregard for traffic signals are emerging as pressing problems that require feasible project solutions, and public entrepreneurship in spatial planning is becoming more necessary than ever.

Emamdeen Fohim from the University of Bern is one of the researchers who study measures public institutions take regarding entrepreneurial behavior to respond to the challenges of a complex, constantly changing environment, especially in spatial planning. He defines public entrepreneurs as persons who take certain risks to develop innovations within the public sector (Fohim, 2019). This complies with other research saying that despite the collective character of public entrepreneurship, it relies on tenacious, highly creative, self-confident, hardworking, decisive and energetic individuals who can see new possibilities and desire to make a difference (Roberts, 2006: 4).

It could be said that a public entrepreneur is also a designer who creates spatial plans and designs the urban environment. Planners must define the spatial vision of a certain territory, i.e., they must develop the legal foundations for defining the spatial strategy and the area within which they will allow future development. By introducing a new spatial vision, spatial planners work on new habits and behaviors that decisively affect the public, i.e., the creators of change in their area (Fohim, 2019). By introducing the changes themselves, planners have to face legal and regulatory obstacles and overcome the resistance of entrenched institutions and everyday practices (Bernier, 2014: 256).

Following such attitudes, the case presented at the end of this paper studies the potential of innovation in spatial planning, specifically regarding the redesign of traffic infrastructure, which would increase the safety of children in traffic. Before analyzing the case itself, it is necessary to provide an overview

of existing knowledge regarding the specifics of children's traffic behavior and analyze opportunities for increasing traffic safety.

4. THE SPECIFICS OF CHILDREN'S BEHAVIOR AND THE RESULTING OPPORTUNITIES TO INCREASE TRAFFIC SAFETY

Child pedestrians make up 30% of the total number of children injured in road traffic in the EU (Deluka – Tibljaš et al., 2022: 1). Due to specific behavior in traffic related to cognitive and physical development, sociodemographic characteristics and environmental conditions, child pedestrians are classified as a vulnerable traffic user (Deluka – Tibljaš et al., 2022: 1). However, walking is one of the primary forms of travel for children, especially in their free time (Gitelman et al., 2019, 36). School children are permanent and mostly independent pedestrians in Croatia, while adults often accompany kindergarten children. Therefore, school-aged children are considered the most vulnerable in traffic (Šimunović, 2022: 17).

Table 1. shows the trends in the number of children killed in traffic accidents in Croatia, according to data from the Ministry of Interior for 2017, 2019, and 2021.

Table 1. Number of children killed in traffic accidents in Croatia

	2017.	2019.	2021.	Trend
Number of children killed in traffic accidents	965	772	699	**-27.56%**
Children killed as pedestrians (%)	25.10%	27.80%	27.90%	**+2.80%**

Source: Ministry of the Interior: Bulletin on Road Traffic Safety 2017, 2019, and 2021. (Bulletin on Road Traffic Safety 2017, 2019, and 2021, 43)

Although it is promising that, according to the presented data, the number of children killed in traffic in Croatia is decreasing, there is still a huge need to increase safety in traffic because traffic accidents are still the leading cause of death of children. Figure 1. shows the number of traffic fatalities per million inhabitants per year for EU member states (ACEA Driving Mobility for Europe, 2023). The picture shows that Croatia has 72 road fatalities per million inhabitants per year, which is significantly higher than the average of the

European Union – 45 road fatalities per million inhabitants. This shows that Croatia belongs to the countries where national road traffic safety programs must be strengthened.

Figure 1. Road fatalities per million inhabitants

ROAD FATALITIES PER MILLION INHABITANTS

By country / 2011, 2021

■ 2011 ■ 2021

Croatia average 2021: 72

EU average 2011: 66

EU average 2021: 45
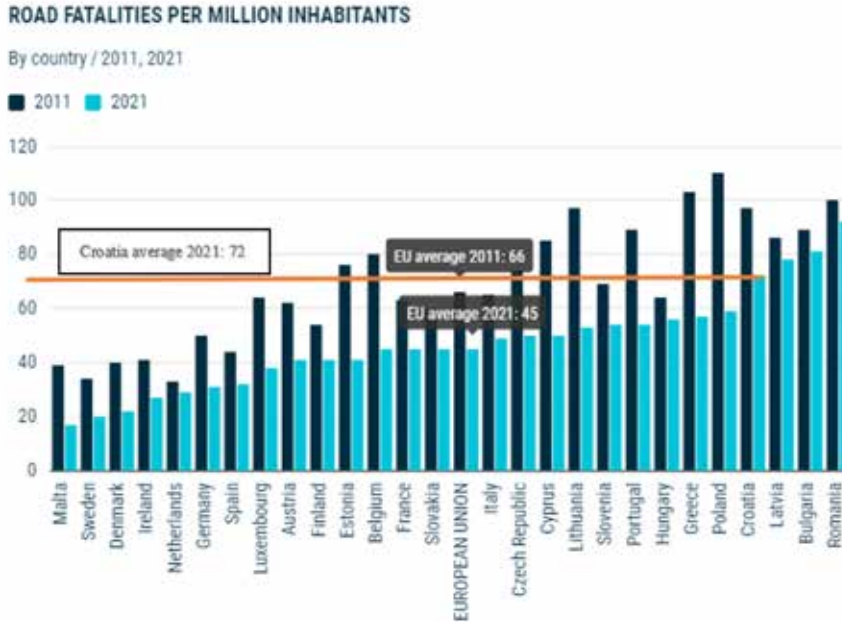
Source: ACEA Driving Mobility for Europe, 2023

Based on existing research on child pedestrians in the area of signalized pedestrian crossings, the leading group of parameters that influence the behavior of children in traffic are sociodemographic parameters (age, gender) and ways of movement of children (supervised or unsupervised movement in a group), urban, infrastructural and traffic parameters (width and length of the pedestrian crossing, duration of green time), and risky behavior that includes distractors (use of a mobile phone, headphones, carrying an object, e.g., books) (Deluka - Tibljaš et al., 2021a: 2; Deluka - Tibljaš et al., 2021b: 2; Ištoka Otković, 2021: 3).

Child pedestrian injuries primarily occur in urban areas, with a significant proportion at pedestrian crossings (Gitelman et al., 2019: 36). A collision between a vehicle and a pedestrian is called a traffic accident, and the collision of pedestrians flows with traffic flows is called a vehicle-pedestrian conflict. The intersection zone, pedestrian crossings, and pedestrian crossings outside the in-

tersection represent a conflict zone where conflicting flows of pedestrians and vehicles meet. According to statistics (Bulletin on Road Traffic Safety, 2021), traffic accidents involving vehicles hitting pedestrians most often occur in the conflict zone, and these are critical points of the system according to traffic safety criteria, especially for vulnerable road users.

When planning and designing pedestrian crossings, when there are no locally defined recommendations, a speed of 1.2 m/s (4.3 km/h) is often taken as the recommended speed used to calculate the green time duration and the minimum pedestrian protection time at pedestrian crossings (Deluka – Tibljaš et al., 2021b: 4). This speed is called the V15 speed, i.e., the speed of 15% of the slowest pedestrians. However, due to their shorter stature and smaller steps, children have a slower movement speed, i.e., they need longer to cross a pedestrian crossing (Safe Driving, 2011). The research of Deluka – Tibljaš et al. (2021) conducted in the streets of Osijek and Rijeka identified that the speed recommended as a relevant speed for the design of pedestrian crossings is 1.0 m/s. This speed should be relevant when defining the length of green time, the time needed to exit the conflict zone, and the length of the pedestrian crossing (Deluka - Tibljaš et al., 2022).

Also interesting is the research conducted in China. This research showed that children's speed is higher in the second half of the pedestrian crossing, which can be attributed to the uncertainty of pedestrians during two-way traffic (Li et al., 2013: 442-450).

In addition to the speed of children's movement, other specifics of children's movement and behavior and their physical abilities are given below, which need to be taken into account when designing pedestrian infrastructure to increase the level of children's safety (Rosén, 2011, 25-33; Safe Driving, 2011):

- lower height - children do not have good visibility of the traffic situation and are more challenging to be noticed by other road users, especially drivers;
- the narrower field of vision - side approaches of vehicles are noticed very late;
- inability to estimate the distance and speed of the oncoming vehicle;
- unawareness of the dangers in traffic - when children see a car, they are convinced that the driver of the car saw them, too;

- unawareness of the environment - children often notice only things that are interesting to them at the moment, while they consider other things unimportant or do not notice them;

- reckless behavior - due to playfulness, movement in a group, and/or the use of distractors, children often react unexpectedly/recklessly and spontaneously, with longer reaction time, according to the level of cognitive development.

A recent study (Ištoka Otković, 2020) proved that children have a statistically significantly longer reaction time, both in laboratory conditions and in real traffic conditions, thus confirming the impact of children's cognitive development on awareness of the traffic situation and the length of reaction time (Ištoka Otković, 2020: 1-15).

Since pedestrians constitute the largest group of traffic fatalities worldwide, it is necessary to develop effective countermeasures to increase pedestrian safety (Rosén, 2011:25-33). Various studies have recorded that the risk of pedestrian deaths in a vehicle-pedestrian conflict increases with increasing vehicle speed. Therefore, knowledge of vehicle speeds at which vehicle-pedestrian conflicts and pedestrian casualties most often occur, in addition to helping to develop future safety systems for pedestrians, can also be used as a guideline for designing cars and pedestrian-friendly infrastructure (Rosén, 2011: 25-33).

In the continuation of the paper, potential measures to increase the level of safety of road users at pedestrian crossings are presented, some of which are innovative and represent an opportunity for public entrepreneurship, especially in the local context.

5. CASE STUDY

In September 2021, as part of the international bi-lateral Croatian-Slovenian project

2020-2022., co-financed by the Ministry of Science and Education of the Republic of Croatia under the title Development of a Model for Predicting the Behavior of children pedestrians in the urban traffic network (led by Associate Professor Irena Ištoka Otković, Ph.D.), an experimental study of children's behavior in real traffic conditions in Osijek was conducted at two non-signalized intersections of secondary network, which included the observation and analy-

sis of the behavior of school-aged children as pedestrians. In addition, three variant solutions of secondary network intersections were created at the conceptual level with elements for protecting the most vulnerable road users. For each variant solution, microsimulation traffic models were created in the PTV VISSIM software, and the results were analyzed for the actual traffic load but also the increase of the existing traffic by 150% and 200% (Šimunović, 2022).

Following this research, a variant solution is presented and analyzed, which turned out to be the most favorable solution for reconstructing the intersection to protect child pedestrians.

5.1. Description of the selected location

The observed and analyzed non-semaforized intersection of the secondary network is located in Osijek, the intersection of Kutinska and Lipička streets, shown in Figure 2.

Figure 2. Work area
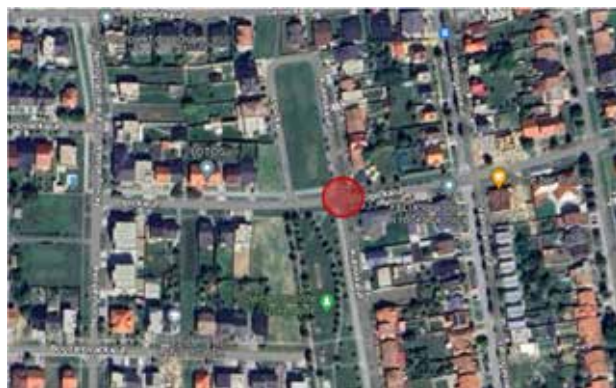
Source: Šimunović, 2022, 40

The chosen intersection is located in a quiet residential area, and near the chosen intersection, there is a kindergarten, a children's playground, and a children's playroom (Šimunović, 2022: 38-46). Due to the proximity of a large number of facilities for children, there is an increased pedestrian traffic of vulnerable road users as children usually move in groups of 2-3 children towards the playground, and their movement is usually careless and playful, spontaneous (Šimunović, 2022: 38-46). In the morning hours, the independent move-

ment of children and movement accompanied by their parents was observed. Also, various forms of risky behavior by children were recorded in the field, such as running across the road, using distractors - cell phones, crossing the road without persuasion, and crossing or running over the road outside of pedestrian crossings.

The PTV VISSIM program was used for microsimulation traffic modeling of the selected intersection. VISSIM is a microscopic simulation computer program based on traffic flow simulations and analysis and optimization of traffic flows. VISSIM is a stochastic, discrete, and time-oriented model that well reflects real traffic's stochastic nature (Šraml & Jovanović, 2014: 10).

Modeling stochastic systems is a mathematically demanding task, so the VISSIM microsimulation model uses a random number generator and statistical distribution of speeds, accelerations, and decelerations, with the input data of measured field data being the median of the statistical distribution, which corresponds to real traffic conditions and driver behavior. The prerequisite of every scientific and professional experiment is the repeatability of the modeling results, so a certain value of the random number generator ensures the repeatability of the experiment and experimental results. Within the framework of this work, an analysis of 10 different traffic scenarios was made, with the initial value of the random number generator (random seed) 42 and the generator step (increment) 10. For each analyzed variant solution of the reconstruction of the transport infrastructure, the same ten traffic scenarios were analyzed, making the traffic indicators' results comparable.

Traffic load, traffic distribution, traffic flow structure, geometric elements of traffic infrastructure, traffic regulation, and vehicle speeds are mandatory input data of the model. These data were determined at the observed intersection under conditions of 24-hour measurement. The device used was the SDR traffic Data Collector, number 4386 B. The SDR traffic Data Collector was mounted on light poles and placed in a closed box of inaccessible and invisible content. It used its battery and did not attract the attention of traffic participants.

Table 2 shows data on measurements at the intersection in question (Lipička and Kutinska streets) using the SDR traffic Data Collector device: maximum speed, V85 speed, and the percentage of vehicles driving faster than the permitted speed (Vexc %).

Table 2. Display of measured data at the intersection in question

Lipička street	Vmax [km/h]	V85 [km/h]	Vexc [%]
Cross - section	88	47	30.4
West - East	88	47	29.9
East - West	65	47	30.9
Kutinska street	**Vmax [km/h]**	**V85 [km/h]**	**Vexc [%]**
Cross - section	61	44	29.7
South - North	61	45	36.4
North - South	58	41	19.7

Descriptions:

Vmax: Maximal velocity

V85: Critical velocity for the first 85 % of vehicles

Vexc %: percentage of vehicles driving faster than
the administrative speed limit

Source: "Traffic Report", data collect - SDR traffic data Collector - Project data

From the table shown, it is evident that the maximum speed of vehicle movement was measured in Lipička Street in the amount of 88 km/h in the west-east direction, which is 48 km/h higher than the prescribed speed limits at the intersection in question. The maximum speed of vehicle movement on Kutinska Street is 61 km/h in the south-north direction.

The histogram in Figure 3 shows the speed of vehicle traffic and the number of vehicles traveling at a certain speed on Lipička Street. Out of the total number of vehicles recorded at the intersection in question, more than 30% of drivers drove at a speed of more than 40 km/h.

Figure 3. Speed histogram for Lipička Street
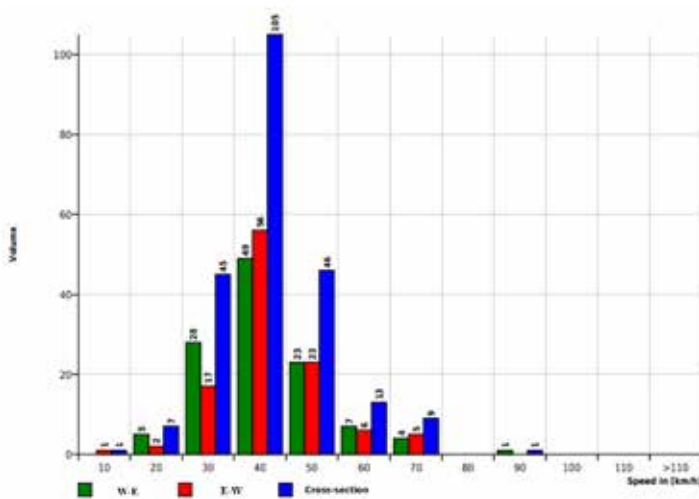
Source: "Traffic Report", data collect - SDR traffic data Collector - Project data

The histogram in Figure 4 shows the speed of vehicle traffic and the number of vehicles traveling at a certain speed on Kutinska Street. Out of the recorded vehicles, about 30% of drivers traveled at a speed greater than 40 km/h for both observed access roads. However, the measured vehicle speeds on Kutinska Street are lower than those measured on Lipička Street.

Figure 4. Speed histogram for Kutinska Street
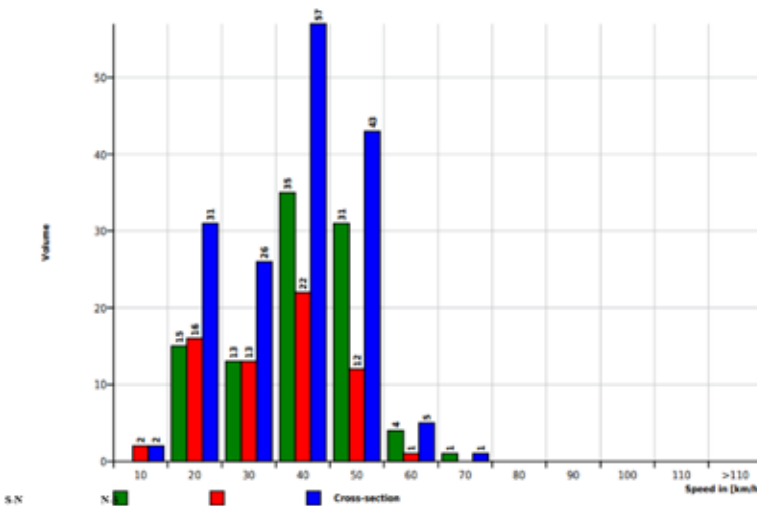
Source: "Traffic Report", data collect - SDR traffic data Collector - Project data

According to the presented data, it is clear that the existing design solution does not satisfy the safety criteria and that the vehicle speeds are, in some cases, significantly higher than prescribed.

5.2. Results and analysis

Of the three reconstruction variant solutions that were analyzed and evaluated using microsimulation traffic modeling, the variant solution that most effectively met the reconstruction goal is presented in detail below. Given that the primary goal of the reconstruction is traffic calming, i.e., protection of the most vulnerable road users, the best results for the reconstruction solution were the implementation of pedestrian islands in Lipička Street and on the lower part of Kutinska Street and the narrowing of traffic lanes from 3.0 m to 2.5 m in the length of the pedestrian island (Šimunović, 2022: 48-49). Pedestrian islands allow pedestrians to cross in stages, which supports them to concentrate on only one incoming flow of vehicles and walk at their speed. Both have been proven by research presented in the theoretical part of this paper to be essential elements in increasing the safety of pedestrian children.

The practical reconstruction solution with pedestrian islands is shown in Figure 5, and Figure 6 shows a 3D microsimulation of the project solution.

Figure 5. Reconstruction solution with pedestrian islands

Source: Šimunović, 2022, 49

Functional and safety criteria were used to analyze the results and compare variant solutions. The functional criteria that were compared in the obtained simulation results are the length of the vehicle line, the delay of vehicles, and the

number of parking spaces, while the speed of vehicle movement represents the safety criteria, the number of conflict points, the length of pedestrian crossings and the separation of the conflict zone (Šimunović, 2022: 52-61).

As previously stated, due to children's shorter stature and smaller steps, they need a longer time to cross the pedestrian crossing. Therefore, shorter pedestrian crossings are suitable. Considering this safety criterion, the variant solution with traffic islands represents the most favorable reconstruction solution.

Pedestrian islands make it possible to cross the pedestrian crossing in stages, and the length of the conflict zone is shortened from 6.0 m to 2.5 m + 2.5 m. Also, pedestrian islands separate the conflict zone into two independent conflict zones. In this way, when crossing the road, pedestrians observe and concentrate on only one traffic flow of vehicles to the pedestrian island. They observe another traffic flow after entering the pedestrian island (Šimunović, 2022: 52-61).

Graph 1 compares the minimum and maximum vehicle traffic speeds for the existing design solution and the reconstruction solution with pedestrian islands for the actual traffic load.

Graph 1. Comparison of minimum and maximum speeds

Source: Šimunović, 2022: 52-61

From the results of the simulations shown in Graph 1, it is evident that the project solution with pedestrian islands achieved a significantly lower speed of vehicle traffic, which is a crucial safety criterion for the measured speed of vehicle traffic at the intersection in question.

In addition to safety criteria, it is essential to emphasize that while achieving innovativeness in pedestrian safety, functional criteria of the crossroad have been preserved in terms of quality traffic flow.

6. DISCUSSION AND CONCLUSIONS

This paper provides an overview of public entrepreneurship development and analyzes the possibility of public entrepreneurship application through spatial planning to increase traffic safety, primarily for children and pedestrians.

It was established that public entrepreneurship in Croatia is a relatively new, underdeveloped concept. However, regardless of the obstacles that public entrepreneurship faces in Croatia, it is reasonable to believe that social structures in Croatia have the potential to foster it. One way to bring the meaning of public entrepreneurship closer to the public (Baturina, 2017) is to integrate it into the education system, which would achieve multiple effects - from spreading knowledge about public entrepreneurship to acquiring skills for starting new initiatives. In addition to the educational system, it is necessary to intensify the study of public entrepreneurship within the academic community. Such practice would generate new knowledge that could be passed on to the young and, simultaneously, be the base for an effective triple helix model, which has been proven necessary for public entrepreneurship applications.

Additionally, the findings of this paper have shown that the increasing number of traffic fatalities advocate for the need to introduce changes when designing the traffic infrastructure. These changes must be innovative in that traffic infrastructure designs must appreciate behavior and other relevant characteristics of traffic infrastructure users while preserving the functionality demands of traffic infrastructure. The emphasis of the presented research has been put primarily on specific traffic behavior of children related to their cognitive and physical development, due to which they are classified as a vulnerable traffic group.

A solution for reconstructing the intersection in question with elements for protecting the most vulnerable road users was created. The solution suggests using pedestrian islands because this significantly reduces the speed of vehicle movement through the intersection, which would increase the safety of pedestrians, especially children.

This change of focus from the technical requirements of transport infrastructure towards the needs of children users during the transport infrastructure design is an example of public entrepreneurship. The challenges that arise when designing traffic infrastructure adapted to the needs of vulnerable traffic users can be successfully overcome by public proposals of innovative ideas from numerous experts in the field of social and/or technical sciences who, working together, contribute to making quality decisions to increase the level of pedestrian safety in traffic.

With new insights into the potential of public entrepreneurship in spatial planning, this work makes a scientific contribution, but its professional and broader social significance is not negligible either. To get closer to the goal vision of zero traffic fatalities by 2050, the presentation of potential innovative measures to increase the level of safety of all traffic participants, and especially vulnerable traffic users, is an opportunity for planners and decision-makers in public institutions to take advantage of the concept of public entrepreneurship and come up with effective and efficient project solutions.

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WOMEN'S POLITICAL REPRESENTATION IN THE REPUBLIC OF CROATIA, MEDIA REPRESENTATION AND OPPORTUNITIES FOR POLITICAL EDUCATION

Zrinka MALEŠEVIĆ, Ph.D. student
Ministry of Labour, Pension System,
Family and Social Policy

E-mail: zrinka.malesevic@gmail.hr

Lucija LERGA, Ph.D. student
Ministry of Justice and Public Administration

E-mail: llerga51@gmail.com

Abstract

Equal representation of the sexes at all levels of political power is a democratic step forward and a principle by which any, in this sense, aware society should function. The Republic of Croatia showed significant positive developments but not always a proportional and equal increase at all political levels and positions. Regarding the increase in the representation of women in political positions, in the report of the Inter-Parliamentary Union for 2021, the Republic of Croatia was highlighted as the country with the most significant overall progress in the region.

In addition to personal interests, which could be considered the most important, many other factors influence the choice of a political vocation, from the political system, quotas, political support of one's party, encouragement for political vocation through education to the influence of the media and the perception it creates about female politicians and for their areas of interest for which they advocate in a society where women are politically engaged.

The paper analyzes data on the political representation of women in the world, the European Union, and the Republic of Croatia. It also envisages the importance of political education, analyzes, presents its possibilities in the Republic of Croatia, and presents data on the representation of women politicians in the media.

Keywords: *Women, Politics, Representation, Education, Media*

JEL Classification: *I21, I29*

1. INTRODUCTION

Gender equality is not just a term commonly used in political debates, media space, etc. In the Republic of Croatia, the Law on Gender Equality defines the above as a term that indicates that women and men are equally present in all areas of public and private life, that they have equal status and equal opportunities to exercise all rights, as well as equal benefit from achieved results. However, even today, when the position of women has improved considerably compared to the earlier period, in many societies, complete equality remains only as a legal definition. This is evidenced by the fact that women gained the right to vote for the first time in New Zealand in 1893 (Nzhistory, 2023), and today women make up only one-quarter of parliamentarians worldwide (WEF, 2023). However, many female politicians achieved significant results for their country and successfully profiled themselves in that still "male" world.

In the total population of the Republic of Croatia, according to the 2021 census, 51.83% are women, while men make up 48.17% (DZS, 2023). In the 30 years of its independence, the Republic of Croatia has had only one female Prime Minister and one female President of the State, so although Croatia has achieved the highest number of politicians at the local level, on the parliamentary level is relatively growing, the proportion of women in crucial and top positions is still low. The most significant overall progress in the region in 2020 in terms of the representation of women in political positions was achieved by Croatia. Women received 16 additional seats in the Croatian parliament in 2020, almost doubling their previous level of representation in the 2015 and 2016 elections (PRS, 2020a). The proportion of women increased further and currently stands at 33% (Sabor RH, 2023).

According to a remarkable 2017 Eurobarometer survey on women in politics, 86% of respondents believe that a female political representative can represent their interests, with women more likely than men to agree (88% of women compared to 83% of men). A slightly smaller number of respondents (82%) believe that a male political representative can represent their interests, of which 80% are women and 84% are men (Eurobarometer, 2023).

Considering that the role of women in political and public life is a unique theme when society thinks about achieving full democracy, it is essential to follow the trend of the direction of the movement of women's representation in politics. Therefore, based on the secondary research method, this paper aims to collect, combine and present data and findings related to women's political representation in essential political functions, investigate and analyze women's media portrayal, examine the importance of general education as well as investigate possibilities for political education to determine the potential impact on motivation and encouragement for women to enter the political arena, as well as to understand the importance of education and the media as possible factors influencing political candidacy or decisions about a political career.

2. WOMEN'S POLITICAL REPRESENTATION IN THE WORLD, EUROPEAN UNION AND THE REPUBLIC OF CROATIA

In the annual report "Global Gender Gap Report 2022 ", published by the World Economic Forum and covering 146 countries, in benchmarking the present state with past periods in the Political Empowerment dimension, the report states that the gender gap in 2022 is 77.6%, what is 8.1% less than in 2006 when it was measured the first time. Significant progress was made between 2006 and 2016, further increasing in 2021 to stop at the 2019 level currently. These results show that it will take 155 years to close the gap in the political empowerment segment. However, the report also showed very positive developments at the level of ministerial positions, where steady and significant progress in increasing the share of women in ministerial positions is visible, which almost doubled between 2006 and 2022, increasing from 9.9% to 16.1%. Moreover, in 2022, the countries with the largest share of female ministers are Belgium (57.1%), Nicaragua (58.8%) and Sweden (57.1%). The average share of women in parliament increased from 14.9% to 22.9%, with the highest share of women

in parliament in Mexico (50%), Nicaragua (50.6%) and Rwanda (61.3%). In the last 50 years, it is evident that women are increasingly taking responsibility as presidents of states, but the increase is not continuous and significant in all regions equally. The longest tenure as president of state was held by the presidents of Germany (16.1 years), followed by Iceland (16 years), the Dominican Republic (14.9 years) and Ireland (14 years). At the same time, Canada is the only country in North America that, in the last 50 years, had a woman as the head of the state. The ten best countries in terms of Political Empowerment, according to the report, are Iceland, for the thirteenth year in a row, with the best results because for the last 50 years, women have been head of state, as well as due to the high representation of women in parliament, Finland has full equality in terms of ministerial positions and increased time that women have had as leaders of the country in the last 50 years, followed by Norway due to the increased share of time that women held as president of the state and more excellent representation of women parliamentarians, New Zealand has increased the number of women in the position of president of the state by 11% in the last 50 years, as well as in the parliament, followed by Rwanda, Sweden, Nicaragua, Namibia, Ireland and Germany (WEF, 2023).

In its 2020 report "Women in Parliament: 1995–2020 - 25 years", the Inter-Parliamentary Union provided a historical overview of data on the percentage of women in parliaments worldwide. Compared to 1995, when the percentage of women in parliaments was 11.3 percent, in 2020, the percentage reached 24.9%, which for 25 years, is an increase of 2.2 times, i.e., the total percentage of women in parliaments more than doubled, which showed that parity is still attainable. Rwanda, the United Arab Emirates, Andorra and Bolivia achieved the greatest progress in the mentioned period. If we look by regions, the countries of America had the most significant increase of 18.6%, and in 2020 they achieved a representation of women in parliaments of 30%. Of the European countries, the Nordic countries were the only ones with over 40% of female parliamentarians. It was also observed that quotas played a significant role and were a determinant of progress in women's political representation. Of the 20 countries with the highest proportion of women in parliament, 16 applied some form of quotas. The report also emphasizes that party policies encouraging women's engagement, strong women's movements and awareness raising have helped as also more political culture toward gender sensitivity (IPU, 2020c).

The current status of Women Speakers of national parliaments is that 61 women preside over one of the Houses of the 190 Parliaments, occupying only 22.5% of the total filled posts. Historically, Austria was the only state where a woman was elected president of a chamber (the Bundesrat) before World War II; 78 times in all from 1945 to 1997, only 42 of the 186 states had a woman chair of parliament or a chamber of parliament (18 European countries, 19 countries in the Americas, three African countries, one country in Asia and one country in the Pacific) (IPU, 2023a). By the end of 2022, the percentage of women Speakers of parliament increased to 22.7% but still below women's overall representation (26.5%) (IPU, 2023b).

According to the "Women in Parliament in 2022" report provided by the Inter-Parliamentary Union states, as of January 1, 2023, although slower growth in 6 years of only 0.4%, the share of women in national parliaments across the world, was 26.5%. The slow growth results from two years of the COVID pandemic and other challenges the world has faced, but the participation of women in parliament has never been so lively and diverse. Women still reach some new and better levels of representation, and gender issues and women's rights have shaped voters' behavior and election results from North and South America to Europe and Australia. Parliaments have improved their operations, but in many countries, the problem of campaign financing that creates a gap between women and men in politics remains. Statutory quotas are still the most significant factor affecting the representation of women in all regions of the world. Parliaments with either statutory or voluntary party quotas elected 30.9% of women in 2022, compared to parliaments without quotas that elected only 21.2% of women. With 40% representation of women in the Parliament, Slovenia, Malta and Colombia can boast, while Australia reached as much as 56.5% representation of women. The countries of America have an average of 34.7% of parliamentarians. Nicaragua, Rwanda, Cuba, Mexico, New Zealand and the United Arab Emirates had parity or a more significant share of women than men in their parliaments. In contrast, in 64 countries, women hold 30% of seats in their national parliaments (IPU, 2023b).

From the results in Table 1, we can see the top ten countries regarding the number of women in national parliaments and the ranking of Croatia in 2023. We can see that, out of a total of 184 countries analyzed by the Paraline database, the highest percentage of women in the national parliament in 2023 has Rwanda with 61.25%, followed by Cuba with 55.74%, Nicaragua with 51.65%,

Mexico, New Zealand and the United Arab Emirates 50%, while Iceland, Costa Rica and Sweden have around 47%. Croatia has almost 32% of women in the parliament. Interestingly, not a single country in the European Union, nor America, has a 50 percent representation of women in parliament.

Table 1. Ranking of the top ten countries in terms of the number of women in national parliaments and ranking of Croatia

Ranking	Country	Chamber	Percentage of women in Parliament
1	Rwanda	Chamber of Deputies	61.25
2	Cuba	National Assembly of the People's Power	55.74
3	Nicaragua	National Assembly	51.65
4	Andorra	General Council	50
5	Mexico	Chamber of Deputies	50
6	New Zealand	House of Representatives	50
7	United Arab Emirates	Federal National Council	50
8	Iceland	Parliament	47.62
9	Costa Rica	Legislative Assembly	47.37
10	Sweden	Parliament	46.42
57	**Croatia**	**Croatian Parliament**	**31.79**

Source: prepared by the authors, data available at Paraline database on national parliaments

Report on Women in international politics, envisaged by the European Parliament in 2006, states that "women represent half the potential talents and skills of humanity and their under-representation in decision-making is a loss for society as a whole" as well as "calls on the governments of the EU to counter negative societal attitudes about women's capacity to participate equally in the political process at national and international levels be it by introducing a legislative change of by campaigning in favor of an increase in women representation in politics as well as to promote the goal of gender balance in all public positions "(EP, 2006).

By the end of 2022, European Institute for Gender Equality (EIGE, 2023), in their monitoring report "Gender balance in politics: November 2022, "states that European Parliament has 38.9% women and 61.1% men. In 2023, the European Parliament had a women president, also the third woman to have been elected as a leader of this institution. In 2023 European Commission has full gender parity, 13 women and 14 men, with an elected first woman as President of the Commission.

As we can see in Figure 1. Members of the European Parliament included 39.6% women and 60.4% men. Luxemburg and Latvia have full parity of 50% women and men, and Finland, Spain, Italy, France, Belgium and Austria have at least 40% women. In Greece, Cyprus and Romain have less than 25% women. Croatia is represented by 33.3% of EU women parliamentarians.

Figure 1. European Parliament: presidents and members (W-yellow and M-blue), EU 28 level and by member states, 2023.
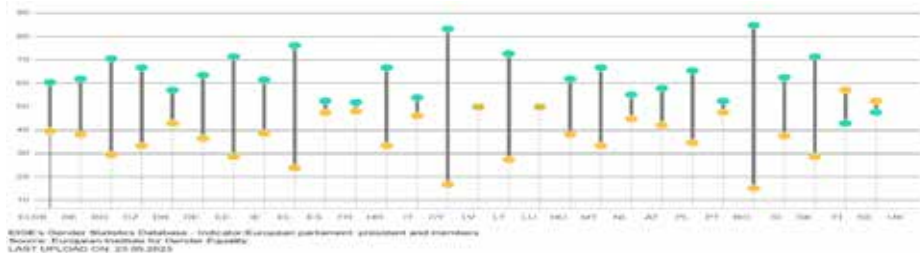
Source: Prepared by the authors, data available at Europa.eu

From the results in Table 2 below, we can notice that Croatia showed significant improvement in regards to women members of the parliament, so in the period 2017-2022, Croatian Parliament had only 17% women members in 2017 compared to 2022, when almost 33% of women were members of the Croatian Parliament, what is 51% improvement. Looking at the data concerning the average of EU countries, we can conclude that Croatia has improved significantly and has shown that it exceeds the average of EU countries in that time frame.

Table 2. EU 28 average for women members in national parliaments, and Croatia (2017-2022)

	2017	2018	2019	2020	2021	2022
EU28	30.3	31.2	32.2	32.8	33.3	32.6
Croatia	18	20.5	19.9	31.1	31.8	32.5

Source: Prepared by the authors, data available at EIGE, 2023

Women's representation at the local level, according to "Women's representation in local government: A global analysis "(UN Women, 2022), a report published in 2021, of 6.02 million elected members in deliberative bodies of

local government, in 133 countries, only 2.18 million (36%) are women. Twenty countries have reached over 40%, 28 have 30 to 40 %, and 70 have up to 30% of women in local government. Fifteen countries have less than 10%. Almost half of the countries use legal quotas, increasing women's representation in local government. It has also been shown that, unlike quotas, electoral systems have less influence on the representation of women at the local level.

Suppose we want to summarize the data for the representation of women in political positions in Croatia. In that case, we can notice that in the last 30 years, the Republic of Croatia has had only one female Prime Minister and one female President of the State. In all convocations, there were a total of 440 members of the Government, of which 50 members were women (11%), but overall, the representation of women members of the Government is continuously increasing, from the first and second convocations, when there was not a single woman member, to certain convocation when that representation was 26%. In the last two convocations of the parliament, representation of women in the Government of the Republic of Croatia was 19% in the 14th convocation and 22% in the 15th convocation of the Croatian government. In all three mandates in the European Parliament, the representation of Croatian women representatives is, on average, around 45%, and the lowest in the current mandate is 33%. Croatian Parliament reached its best score in 2022, with almost 33% of women representatives. Currently, 26.39% of women are represented in the bodies at the local level. Croatia is moving towards parity, but not simultaneously at all levels. The highest political positions are still more often reserved for men (Vlada RH, 2023; Sabor RH, 2023).

3. EDUCATION AND POLITICAL EDUCATION, IMPACT ON WOMEN POLITICAL REPRESENTATION

Education is an activity by which a person is shaped. It has two goals: preservation and transmission of civilizational values through the generation, and it is only possible when a person is connected to these values and behaves by them. A person is open to existing values and the creation of new skills and education that sense has another goal, to shape a person's personality through creative force and power. To sum up, education is defined as shaping, since in education and through it, an activity takes place in which man builds his personality

and at the same time builds the civilization beyond his personality (Rotenstreich, 1952: 96). The government implements the policy, and it includes three components: the direction of management, the social force that implements it, and the struggle within society over who will participate in management. It has been shown that politics and education are in the same field, where education is a means of shaping, while politics are means of management (Rotenstreich, 1952). Specific values determine each political system, and the stability of democratic political structures depends on the level of acceptance of these values by elites, masses and activists. This process is called political education. Pandey and Kumar (1977: 519) explain, according to Prasad (1997), its five comprehensive dimensions: political awareness, political articulation, political participation, political engagement and political judgment. Also, Pandey and Kumar (1977) believe that political education helps understand the functioning of the political system and state that the more citizens are exposed to the values of the political system, the more citizens feel their role in society and their political knowledge and democratic experience expand.

The abilities and talents of women, as well as the fact that they make up more than half of the world's population, indicate the need for equal representation in places of political power. If we want more women in politics, we must remove numerous obstacles, from glass ceilings, labyrinths, and social-economic, structural and cultural obstacles. Bari (2005) believes that women do not have adequate social capital due to their lack of experience as leaders. Therefore, voters do not recognize them and do not have sufficient financial resources to enter the political race. In addition, they lack political education and skills and access to information.

The political education of women should aim to increase the level of awareness and understanding of politics, political or issues of national importance and their importance for society, as well as the dangers of being disinterested and ignoring politics, understanding the importance of political power and the strength of participation in social issues, educating women about their civic rights and duties, education about the importance and participation in the electoral process, about gender stereotypes in politics, about the fight against corruption, building capacity for personal development and motivating women to take up political office (Ashipu, 2017). Importance of education Bari (2005) has confirmed by finding that countries where women hold more than 33 percent of seats in parliament are highly positioned in the category of human devel-

opment, which means, among other things, that girls and women have a greater likelihood and opportunities for education. Cunanan (2018) states that it is necessary to ensure that all women and girls go to school and receive the same type of education as men. It is necessary to ensure the participation of women and men in advocating for the right to vote and political participation of women, encouraging women to be aware of the right to vote and participate in social activities, the formation of laws and policies that encourage women's political participation, enable education and workshops on leadership skills for women, strengthen women's movements, strengthen pressure on political parties to ensure more places for women in their ranks and raise awareness of the importance of women's participation in politics as well as to give necessary guidelines to the media on how to use their example to motivate women into politics and how to monitor political candidates. Bari (2005) believes that liberal democracy needs a significant change to create space for women in politics and points to the indirect connection between access to health, education and employment with a woman's ability to create space for her personal growth and development and involvement in politics. The availability of these three resources enables a person to have a greater choice and to develop competencies and skills.

However, there are also different views about the correlation between education and the representation of women in politics, so analyzing numerous studies, Goetz (2004) argues that there is no apparent connection between greater and better education and the increased activity of women in politics and for a simple reason, the specificity of countries. Thus, a wealthy and educated woman in one country ignores politics and political engagement. In contrast, illiterate women significantly influenced politics in other countries. In contrast, in the third case, for example, despite the high status of women, their political participation was meager. According to Goetz (2004), cultural variables have shown greater importance than education. For example, a more significant number of women in positions of power and authority will increase the level of acceptance of women in politics, as well as systems based on kinship and patronage rather than on individual merit, and adds that it is necessary to study other activities such as lobbying, membership in political parties and associations to determine what motivates women to engage in politics. Today, no institutions would continuously educate and work on developing human capital dedicated to political leadership. Pena (2021) emphasizes that the academic community, civil society and similar organizations are supportive, but not a strategic long-term solution

to this situation. On the other side, Dag et al. (2015), although they observed that political education is viewed in an informal sense and its formal approach is neglected, they do not see the need for a separate subject in political education but instead propose the integration of political education within the already existing educational programs of civic education, the media and communications, entrepreneurship and the like, because as a cross-curriculum, it will provide children and young people with comprehensive and diverse access to experiences that will contribute to their perception and critical thinking of the society and how to contribute actively. Also, despite some of the previous analysis, we can see that some more recent reflections have remained on the trail of connecting the influence of education and the representation of women in politics, stating that due to a lack of political education and education in general, women fail to enter politics. Due to a lack of political knowledge, women are not sufficiently aware of their fundamental and political rights. Women's social movements depend on their education, and the possibility of women's participation in decision-making in politics can significantly affect their empowerment. Therefore Chaurasia (2020) believes that formal education organized through educational institutions provides an opportunity for motivation toward leadership and the development of critical thinking. Citing Nie and Hillygus (2008: 30) that education "is almost without exception the strongest factor in explaining what citizens do in politics," Willeck and Mendelberg (2022) argue though that how it is not the amount of civic education that is important for political participation, but how civic education is taught, while highlighting active learning strategies that include civic education based on experience, the development of critical thinking, and education within the framework of open classrooms. In an open classroom atmosphere, different opinions are exchanged and social and political issues are critically reflected upon (Rapa et al., 2022).

The future of democratic political systems rests on the knowledge and abilities of citizens. Therefore democratic states have shown interest in political education as an essential part of the school system, states Šalaj (2005), opting for political education as an independent subject or as part of integrated social education. Analyzing political systems in the USA, Bos et al. (2022) observed that school curricula show political leadership as a male domain. Therefore he considers it necessary to improve them with examples of female leaders and their traits and capabilities. According to the ESCAP UN report (2019), twenty countries implement mentoring programs for women in leadership, public

speaking, organizing political campaigns, building confidence, etc. According to the research conducted in the Republic of Croatia in 1995. 93% of highly educated women were interested in politics (Leinert Novosel, 1996). The National Curriculum of the Republic of Croatia introduced cross-curricular topics of civic education (Šarić, 2019). However, Croatia has no systematic political education for women politicians or potential candidates. Education is organized occasionally at the level of individual initiatives within foundations, organizations at the level of counties or civil society organizations (EIGE, 2015).

4. MEDIA

Both in the world and in the Republic of Croatia, the media is the industry that can do the most to create the image of women in society, including politicians. The connection between politics and the media is complex and very strong because it is the media that, in today's world of modern technology, reach the "broad masses" the fastest, often creating a complete picture of a politician that is rarely questioned. What is worrying is that the image of women in the media is rarely favorable. Such a worrisome trend is not only a matter of the Republic of Croatia but also much broader, namely the Parliamentary Assembly of the Council of Europe concluded in April 2002 that women are inadequately represented in the media and that their image is often stereotypical and sexist because they are either primarily associated with or seen exclusively through their private life (home and family life), or often depicted simply as sexual objects (CEF, 2002).

Grbeša Zenzerović observed five essential stereotypes in political coverage of female politicians: objectification (focus on appearance and sexist statements), construction of emotionality (display of exaggerated sensitivity, a trait generally attributed to women, degradation and representation that a person is incapable because he is excessively emotional and irrational), depersonalization, incompetence and motherhood (a woman has a place in the house, next to her husband). Croatian President Kolinda Grabar Kitarović was exposed to all the stereotypes above (Srdoč, 2023).

The institution in charge of promoting gender equality in the Republic of Croatia to raise the general public's awareness of the equality of men and women as one of the fundamental values and conditions for faster economic development and social prosperity of a society is the Ombudsperson for Gender

Equality, and Croatian Radio and Television (HRT) as the public institution, which the Republic of Croatia founds, is obliged, within the framework of legal obligations (Act on Electronic Media, NN 111/21, 114/22), among others, to respect and encourage the pluralism of political, religious, ideological and other ideas and to enable the public to be familiar. With these ideas. In its programs, HRT may not represent the views or interests of an individual political party nor any other individual political, religious, ideological or other views or interests. HRT must produce, co-produce and publish programs to achieve equality between men and women (Act on Croatian Radio and Television, 137/10, 76/12, 78/16, 46/17, 73/17, 94/18, 114/22, 20/23).

In connection with the above, it is a worrying fact that according to research by Leinert-Novosel (1999), the analysis of the one-day program of HRT in 1997 showed the most significant difference between the sexes on television. When talking about politics, 93% of men took part compared to 7% of women, where just dealing with political topics and the profession of a politician presented power, strength and higher social status. In contrast, women were portrayed within traditional female stereotypes about beauty, submission, orientation towards the family, and subordination to a man or husband. Although this is much older research, the same thesis was confirmed by Bodiroga-Vukobrat and Martinović (2017) in a study of the European Parliament from 2017, where the problem of the appearance of gender stereotypes and sexism in Croatian audio-visual, electronic and print media was also observed. Moreover, an example of commenting on or criticizing the physical appearance of female politicians is often cited.

The media in Croatia pay much more attention to male political candidates than female ones. In 2013, Sever and Andraković (2013) analyzed 38 episodes in which the marginalization of women in socio-political topics was clearly shown. Out of 191 people in the shows, only 24 were women, and women were significantly less represented, which is why it was not possible not even determine a precise topic to which the active participation of women in politics would be tied.

One of the reasons for the smaller number of female politicians may be due to the generally lower representation of women in politics, and how they are presented depends on journalists and editors. One of the problems is that men as news authors more often choose men as sources of information, and only

2.5% choose women as sources. All the research so far points to the need for lifelong education of the media, i.e., journalists, and educating citizens about developing critical thinking towards the media. Women have always had to fight for their right to vote. In some societies, this fight lasted longer. Men were the ones who had the full right to vote and decided everything a woman was allowed to do. Women were deprived in all areas, especially in politics. Croatia has had five presidents, and only one was a female president. In Croatia, there has been only one Prime Minister, Jadranka Kosor, but none of the 12 Speakers of the Parliament has been a woman.

For all the listed reasons, the portal "zeneimediji.hr "was launched in the Republic of Croatia. It is dedicated to empowering and informing women and teaching and raising awareness of all citizens, public figures, public policymakers, civil society and especially the media about the issues of the position of women in society, of which they are a fundamental pillar. The portal is part of the Women and Media project, which began as part of the Women and Gender Working Group of the Mediterranean Network of Regulatory Bodies (MNRA), of which the Electronic Media Agency is a member. With this project, the Agency and the Council for Electronic Media strive to connect all relevant stakeholders to create the highest quality content to strengthen the position of women in the media and emphasize the success of women in all fields of life. The zeneimediji.hr portal is supported in partnership by Ombudsman for Gender Equality, Ombudsman, Office for Gender Equality, Ministry of Demography, Family, Youth and Social Policy, Central State Office for Sports, Croatian Olympic Committee, Croatian Association of Employers, Croatian Society of Dramatic Artists, Association B.a.B.e., Women's Room - Center for Sexual Rights, Caritas and other organizations and individuals. (URP, 2023).

The negative trend of representation of female politicians in the media continued in the election campaign for the 2016 parliamentary elections, where, according to the analysis of Felger, Lesinger and Tanta (2017), women were occupied in the total number of tonal fragments on the topic in question: on HRT 11.5%, on NOVA TV 14.7% and on RTL 13.2%. The situation did not improve significantly even in 2020, where the ratios were as follows: 15.8% of politicians appeared in HRT's broadcasts, NOVE TV 17.6% and RTL 18.2%. After reviewing 29 shows of four television stations (RTL, N1, NovaTV and HRT) devoted to presenting male and female candidates from the candidate

lists, it was determined that male guests were much more represented, while women were underrepresented. (PRS, 2020).

Table 3. shows the representation of male and female candidates from the candidate lists in the 2020 election campaign.

Table 3. Representation of male and female candidates from candidate lists in TV shows

TV	Number of shows	Total guests (women and men)	Man %	Women %
N1 TV	10	20	65	35
RTL	6	27	74	26
HTV	4	22	64	36
NOVA	9	36	81	19
Total	29	105	72	28

Source: prepared by authors, data available at PRS, 2020

Research by the Agency for Electronic Media, the three most watched national television stations, Hrvatska Televizija (HRT1), RTL and Nova TV, found that in the period from October 1 to 31, 2021, within 93 shows and 2439 programs, the representation of women as experts interlocutor on topics related to politics and the government, amounted to only 15% (Women and media, 2022).

The situation in written media is also not much better than on television. Moranjak Bamburać et al. (2006) conducted a large-scale study covering nine daily newspapers in Bosnia and Herzegovina, Croatia and Serbia. The results of their research are presented convincingly that men dominate in almost all media. They are associated with severe critical topics, such as politics and the economy, while women are more exclusively associated with entertainment, culture and art.

Despite the rather alarming trends, the situation is undeniably changing from year to year. What is essential is, in addition to the constant education of media workers, indeed also the education of citizens in the direction of using the media as a tool to approach our personal views critically and that in every media presentation, we can critically approach certain people or information, creating our attitude that will not be based only on our own experiences and attitudes, but also be created on valuable and objective information. Also, we

must be aware that sometimes the media create information and news as they would like it to be and not as it is. It is a comforting fact that women politicians still, despite constant proof, decide to engage in politics, which should be a noble profession aimed above all at improving the lives of their community. It is indisputable that female politicians and leaders in these areas have successfully fought against media imbalance and that they have fought for the position of some future generations in the world of politics.

5. CONCLUSION

Equal representation of both sexes in political positions signifies a country's democracy. It indicates that society wants to use all the advantages of traits, skills, abilities and knowledge exchange to benefit society. In politics, women have made substantial strides in recent decades, but it is also evident that parity has not been achieved. Numerous analyses and reports emphasize that at least one more century is needed to reach the moment of parity. However, the data still depend from country to country and on the levels of political positions. There is the least number of women in the highest positions where political decisions are made, the positions of presidents of states, governments, parliaments and ministers. They are better represented in parliaments at the local and regional levels. To encourage and support women in thinking about possible candidacy and involvement in politics, two aspects of education and the media can help. Society rests on knowledge, and research has shown that education affects women's interest in politics. School programs need to be adjusted and improved with programs highlighting the importance of women's political leaders. In the framework of lifelong learning, various forms of political education should be introduced to boost potential candidates and existing politicians in spreading the knowledge in the areas needed to succeed in their political endeavors. The media certainly have a significant role in all of this, which can be a positive factor that will spread the inviting image of women politicians within their ranks as also towards the public and give women politicians more media space so that they can present their ideas and successes, which would undoubtedly reduce stereotyping that politics are a male domain.

Nevertheless, this research is also subject to some limitations. Although Croatian state authorities responsible for monitoring follow the topic of the media, there is no detailed analysis of the representation of women politicians

in the media after the elections, and it is not updated frequently, so some data is not very recent (last is from 2020 elections). Foreign sources of literature, research and discussion have a somewhat lively debate on the topic of (political) education. They are of recent date, while Croatian sources in this sense are smaller in scope, generally addressing the topic and older date. Given that Croatia is preparing for the new election cycle in 2024 (European Parliament Elections, Croatian Parliament, and Presidential elections), this moment is not only significant for everyone involved in the election processes but also an opportunity for further and more extensive research, as a performance of additional studies of topics regards correlation of media and (political) education on women political participation and representation.

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WARGAMING AND DECISION-MAKING PROCESS IN DEFENSE

Dalibor GERNHARDT, PhD candidate
Croatian Defense Academy "Dr. Franjo Tuđman"

E-mail: dalibor.gernhardt@morh.hr

Davor ĆUTIĆ, Ph.D.
Croatian Defense Academy "Dr. Franjo Tuđman"

E-mail: davorcutic@gmail.com

Tina ŠTENGL, PhD candidate
Croatian Defense Academy "Dr. Franjo Tuđman"

E-mail: tina.stengl@morh.hr

Abstract

The decision-making process is a crucial aspect of any organization, as it determines the success or failure of the actions taken. Effective delegation of responsibility and transferring decision-making powers to management and organizational levels is essential to this process. A simple organizational structure is often applied in more straightforward organizations, where decisions are made at a single level for all operations and activities. However, this is not always the case in government agencies, where the challenge lies in creating effective information models with accurate measurements, reporting, and decision-making processes. Information is a crucial component of the decision-making design, as the quality of decisions depends on the quality of data and measurements.

This paper firstly analyses the decision-making process in general, including the theories of decision-making and the application of game theory and wargaming in the defense decision-making process. Secondly, for the first time, we describe how war games are implemented in the education of military officers in Croatia and present the initial results of this approach. The authors have a clear objective of presenting the significance of these tools in the decision-making process

and how they can be effectively utilized to improve the quality of decisions made. The authors aim to provide insights into the decision-making process and its impact on the defense sector by exploring the theories and applications of game theory and wargaming.

Keywords: decision-making, decision-making process, wargaming, defense decision tools

JEL Classification: C7, C71

1. INTRODUCTION

Here it is essential to clarify what the term decision-making means. Thus, decision-making is a skill that is the foundation of successful leadership and management, and these skills are the hallmark of a successful manager. In different organizations, decisions are made at one or more levels, and the more complex the organization is, the more complex the organizational structure is, and the more levels of decision-making there are. The possibility and ability to delegate responsibility and transfer decision-making freedom and responsibility to lower levels of management and organization are significant for the decision-making process. Simple organizations tend to have a more straightforward organizational structure where decisions are made at one level for all organizational jobs.

One of the challenges for government agencies worldwide is to have an effective information model with measurement, reporting, and decision-making processes. The essential part of organizational decision-making is information and, therefore, the associated measurements and data. The second important issue is understanding decision-making and the tools used to support the decision-making process. A ubiquitous and growing tool in the defense decision-making process is war gaming. There are a large number of books, manuals and academic articles on this topic, written, for example, by Banks (2022), Perla (1990), Perla and McGrady (2011), Linick et al. (2020), Schuurman (2017), Vego (2012), as experts in the field of wargaming as a decision-making tool in various business and military environments. Some institutions have developed and applied wargaming as a tool, such as the Defense Resource Management Institute (DRMI, 2022), the UK Ministry of Defense, the UK Joint Doctrine Publication (UK gov, 2010) and RAND Corporation. Some authors such as Appleget, Burks and Cameron (2020), Curry and Longley Brown (2019), Sa-

bin (2014) and McHugh (2013) wrote books such as Handbooks and Simulation instructions for wargaming practitioners in defense and military.

For that purpose, this work provides insight into decision-making in defense. To clarify further, one chapter is devoted to wargaming as a decision-making tool, showing how wargaming has been applied in the three countries Germany, USA, Croatia and NATO as international defense and security organizations chosen by the authors for this article. In the final part, we describe our methodology for implementing war games at all military officers' education levels in Croatia. Wargaming education is recognized by NATO, and in this work, for the first time, we describe the first attempt at applying educational wargaming in Croatia.

2. DECISION-MAKING IN THE DEFENSE SECTOR

Regarding overall defense decision-making, there are certain specificities, as the UK Joint Doctrine Publication (UK gov, 2010) states that national instruments of power are diplomatic, economic and military, all of which are supported by information.

The term soft power was introduced in the 80s by the American scientist Joseph Nye (2004). He interprets that soft power "rests on the ability to shape the preferences of others" and relies on values expressed through institutions and culture, examples set through practices and policies, and relationships with others.

The Joint Doctrine Publication says that national instruments of power are diplomatic, economic and military, all underpinned by information. Hard power is "the threat or use of military or economic coercion or physical action to achieve influence." However, hard power is only effective if it is credible. Soft power is the ability to persuade or encourage others to take an alternative approach. Soft power may influence others to adopt a preferred approach through cultural and ideological means. By combining hard and soft power - sometimes called 'smart power' - nations "maintain their legitimate interests or demonstrate their values" (UK gov, 2016).

Joint Doctrine Publication defines that in defense, understanding is the foundation of everything we do:

+ informs about our elections when creating state policy and strategy;

- supports the use of national power to achieve influence; and
- is a prerequisite for effective decision-making. Understanding helps us identify the causes of conflict, the nature of emerging crises, and the context.

In defense, understanding underpins everything that we do:

- informs our choices when developing state policy and strategy;
- supports the application of national power to achieve influence; and
- is a prerequisite for effective decision-making. Understanding helps us identify the causes of conflict, the nature of emerging crises, and the context required to determine coercion or response postures (UK gov, 2016).

3. WARGAMING IN DECISION-MAKING

This chapter discusses the importance of game theory and wargaming as a tool in the decision-making process. Wargaming is a specific tool developed in a military organization based on a theoretical model as a branch of modern mathematics.

Game theory has been applied in the business world, and as stated in CROMA (2022): "Game theory (German: Spieltheorie) is a scientific discipline and a branch of modern mathematics. Theory deals with describing conflict situations and finding appropriate models for them solving", that is, "game theory has the task of finding solutions in situations of competition (as well as cooperation), in which the interests of at least two opponents partially or completely conflict." Game theory can be seen as a mathematical tool and framework that deals with the formal aspects of rational decision-making. From the game theory perspective, what distinguishes games from non-games is not the seriousness or frivolity of the situation or anything like that. Researchers view a game as the strategic interdependence of two or more players whose gains and/or losses depend on each player's and their opponents' decisions.

In wargaming, it is crucial to distinguish levels. When preparing and developing scenarios, it is not the same at which level of decision-making wargaming is applied. Different types of war games are used for different levels of decision-making. For example, military and strategic war games completely differ from

operational or tactical games. The higher the decision-making level, the more abstract the games are. In scenario concept and decision, the application differs for war gaming as the strategic decision-making tool. It is entirely different when considering military wargaming at operational and tactical levels.

War games represent an essential element in the decision-making process. For example, in the USA (Burns, 2013), and the UK (UK MoD, 2017), war games are an integral part of the curriculum of the military education system, even in the field of cyber security (Kodalle, 2021). This is particularly important because military training and the adoption of war games as a model and their application and "playing" within the context of teaching creates a foundation and understanding so that it can be carried out at various levels after the training is completed as part of simulation exercises and role-playing. War games are shown throughout the education cycle and played out at the highest level of defense management and the chain of command in the armed forces, playing out different scenarios.

Putting the level of wargaming aside, according to (Appleget, Burks & Cameron, 2020), we can distinguish three basic types of war games: Educational, Experiential, and Analytical. The purpose of educational war games is to pass knowledge to the participants. Participants are placed in a situation where they are likely to find themselves in the future to consolidate the knowledge acquired in the classroom. Experiential war games are designed to place participants in situations based on their current or assumed future roles and responsibilities. As the name suggests, experiential games aim to give participants experience of a particular job or task, i.e., a situation they are likely to find themselves in. Analytical war games provide insights and information about a specific problem, identify risks and create plans for future operations. In analytical games, the participants are subject matter experts, and the observation team records their reactions to develop new insights. The core of the games is the Data Collection and Management Plan (DCMP), essentially a list of information or problems that need to be produced as part of the war game (Appleget, Burks & Cameron, 2020). During the game, the role of the observation or data collection team is to collect information or player responses, usually developed around essential questions or learning objectives, depending on the nature of the game. Developing essential questions is a challenging task and topic. More information on determining specific questions can be found in Adams Schilling Chapter 13 of

(NATO STO, 2019), "Connecting outcomes to indicators: A model for selecting indicators."

The purpose of conducting war games and playing out various scenarios based on predictions of possible future events is to provide a framework for planning the necessary future capabilities of the defense system. Such games enable the chain of command to acquire the ability to make independent or collective decisions in specific situations. By playing through different scenarios, through a series of iterations, the ability to react and act promptly to a specific event, crisis and challenge in the environment is achieved. A frequent comment concerning war games is that some aspects of the game are not realistically portrayed. Usually, games are designed to balance the rules' complexity with the game's simplicity(UK MoD, 2017). In system games, for example, there are often many rigid rules. However, such a game requires a steep learning curve; again, some aspects of the game may not be modeled correctly.

On the other hand, we have the Matrix game method (Engle, 2019). Here the consequences of specific actions are determined mainly by discussions between players (Brynen & Mouat, 2017). Due to the complexity of computer modeling, the designers usually gain all the experience, but in war games, all participants can learn as they play.

To understand the importance of war games, here is the source and explanation of the game theory, which is the basis for developing war games. Perla and McGrady (2011) describe what games give players of "high-engagement games." In terms of responsibility for the result of the game, "games give players active responsibility for their decisions, similar to what they would experience in the real world, and force them..." that is, state (...that they bear many consequences of those decisions, positive and negative."

The authors go on to talk about the consequences or outcomes of the game, stating: "These consequences include not only physical changes in the decision-making environment but also the psychological effects of making those decisions and dealing with the effects or results" Although there is no system or training that can predict every situation or create the same stress that would occur in an actual situation, well-prepared scenarios and effective high-engagement play can better prepare leaders to deal with the contingencies they will undoubtedly face. The game scenario may be similar, but not identical, to the actual situation they will face. Crucial in conducting war games, as Perla (1990)

in his book, "synthetic experiences will help prepare them (commanders/leaders op. a.) to ask critical questions while planning and preparing for an unpredictable range of possible events in the future."

In the paper, Perla and McGrady (2011) identify two critical concepts for understanding wargaming: "presented narrative," which is what we call the written or predetermined narrative created by game designers; "constructed narrative," which develops through the actions, statements and decisions of game participants. The game's overall narrative includes both the presented and constructed narrative (Perla & McGrady, 2011). Determining resources in mission or marketing-oriented large companies or government departments is complex because of the many possible investment plans that can be considered. This complexity is in addition to the regular uncertainty associated with changes in the environment - changes in competition, technological innovation, etc. For example, in the US Department of Defense, it is not uncommon for tens of thousands of different categories to be reviewed yearly. Decisions are then made on determining sources of funds and personnel for the coming budget year and projections for the next six years. Similar activities are carried out in the nongovernmental sector.

The US Department of Defense built a very complex Planning, Programming and Budgeting (PPBS) system in the early 1960s to rationalize the problem of resource allocation. The subject of PPBES was elaborated by Ćutić (2010), who discusses its application in the Croatian MoD as a basic system of strategic management of defense resources that makes the efficient and rational distribution of available resources following national security goals.

A basic training program for PPBS training was built, and therefore the General Electric Company formed the think tank TEMPO, which developed a "game" for training users to work in the new system. Wargaming or war games are simulations, play-throughs, and implementations of a real system or process model over time (Banks, 2022). They are used for business play- through or analyzing a particular procedure, action, or modeling of a real or hypothetical situation.

Numerous publicly available war games have been developed for training military personnel. A newer example at the tactical level is Littoral Commander by Sebastian J. Bae (Grant, 2022), and at the operational level, the Operational Warfare System (OWS) game series by Tim Barrick (Reed, 2021; Marine

Corps University, 2022). At the strategic level, there is, for example, the game Baltic Challenge by Tom Mouat and others (Bynen, 2016). The authors have tested all the games mentioned and concluded that the games TEMPO and Hedgemony are applicable outside military circles for a wider civilian audience. For this reason, two models: TEMPO and Hedgemony, a strategic choice game, are presented below to illustrate war games.

3.1. "TEMPO" Game

TEMPO is a military planning game used to teach resource allocation. The strategic decision-making game TEMPO was developed at the Defense Resource Management Institute (DRMI, 2022), part of the Naval Postgraduate School (NPS). In this game, players make a series of resource allocation decisions. The game illustrates many fundamental concepts of modern defense management, such as opportunity cost, quantitative analysis, decision alternatives, frontier analysis, cost-effectiveness, etc.

The TEMPO game develops a conceptual framework that links the military planning game TEMPO and the curriculum to challenge defense management: efficiently using scarce resources to ensure national security. This strategic game examines the development of defense organization and management systems within the DoD and relates them to the problem of efficient and effective resource allocation.

DRMI has used the game TEMPO in its courses for almost 40 years. The game illustrates the dilemmas of defense resource management and shows how to prioritize and make good decisions in a short time. It raises the question of how to distribute the funds available to the staff and how much to equip with (new) systems. Deciding whether to research and develop one's own material resources or buy already-developed systems is also a challenge. The challenge is to decide how much money to spend on obtaining information about the enemy's forces and/or protecting information about one's forces.

3.2. Hedgemony A Game of Strategic Choices

In 2020, a group of authors (Linick et al., 2020) for the Rand Corporation published a new decision-making game, Hegemony, designed to teach U.S. defense professionals how different strategies could affect key planning factors.

Hegemony is specifically designed for people who have significant subject matter expertise and requires a thorough understanding of the game rulebook. In particular, this game is aimed at decision-makers considering Hegemony in a professional (decision-making environment) or academic environment (for teaching and training students). The before-mentioned rulebook provides experts, decision-makers and practitioners, and senior-level decision-makers with a comprehensive overview of what is needed to plan, prepare and run a gaming session and refreshes this knowledge on the topics.

It is valuable to learn how the game was developed, including the key features and trade-offs made by the design team. Running this game requires an experienced facilitator and subject matter experts (SME) to support the game. The game is designed for six players, but for quality gameplay, many SMEs are required in addition to the appropriate players. SME's role is to provide insight into how some nations would react in each situation, allowing for a realistic decision-making experience. The players' actions do not have to be successful, some things do not go the way the players want, and other players can interfere with another player's actions and thus disrupt their plans. The game simulates the pressures on the players and the lobbying of various interested parties, which may not be aligned with the player's interests.

In general, it is a constant challenge for strategists and decision-makers at the political level to develop essential documents for formulating and directing defense policy. This game is aimed at a targeted yet broad audience of defense planners, developers, budget specialists, managers, analysts and policymakers involved in creating defense capabilities to respond and achieve defined objectives within a given defense strategy.

4. WARGAMING IN PRACTICE

Various authors have discussed the practical application of war games. In this chapter, the authors have chosen the examples of Germany, the USA, and NATO to illustrate and give an example of the application of wargaming. Vego (2012) finds the sources for war games and their practical application in India, China and Persia and cites authors who have dealt with this topic throughout history, making this article an excellent historical overview of the development of war games.

War games usually assumed a bipolar world, and participants did not play specific roles. However, they considered the rationally based actions of the main actors and creators of global security, which posed a significant challenge for scenario creators as they often guided discussions of questionable reliability (Matković, 2003).

4.1. German wargaming

The Prussian army introduced professional war games (ger. *Kriegsspiele*) at the beginning of the nineteenth century. The Prussian army's motivation for developing games was pointed out by (Schuurman, 2021) after the Prussian successes during the German Wars of Unification (1864-70), followed by other European armies, the USA and Japan. War games emerged in Germany in the 18th and 19th centuries. At that time, Germans tested different types of games. They were guided by two basic requirements: The game should be as realistic as possible but also simple and close to the players, i.e., user-friendly. The reality orientation led to a complication, which automatically reduced the simplicity of the game performance.

Schuurman (2021) considered the historical context of war games in two books, "Models of War 1770-1830: The Birth of War Games and the Trade-off between Realism and Simplicity" (Schuurman, 2017) and "A Game of Contexts: Prussian-German Professional War games and the Leadership Concept of Mission Tactics 1870-1880". Both books trace the historical development of war games in Germany.

Schuurman discusses war games in the books mentioned above and highlights Georg Leopold von Reiswitz (1764-1828) as the first creator of war games. The game at that time was played on a large board with customizable topographical squares or "figures" representing infantry, cavalry, and artillery that "moved" around the board, making moves as options to resolve the conflict. It is interesting to note that according to Schuurman, seventy-five books on war games were written in Germany in 100 years, from 1801 to 1900 (Schuurman, 2021). Vego (2012) writes about the development of war games in Germany, from which the games spread worldwide. His work, it can be tentatively said, follows from Schuurman, as he emphasizes the period from the mid-19th century and Moltke to Schlieffen, the period between the two world wars to the last operations at the end of World War II. The same author concludes that war

games contributed significantly to the superior level of professional education and combat training in the German army and emphasizes that they were superior at the beginning of the wars. He emphasizes German superiority because they showed that they could use war games effectively and creatively to educate current and future leaders and their staffs at all levels of command and to train them in assessing situations and making quick and sound decisions. The war games significantly improved the preparation of their officers in all aspects of warfare at all levels, and in the games, new methods were tested, and the foundations of doctrinal documents were verified.

In conclusion, he warns that although the German methods of organizing and conducting the war games are well organized, they cannot and should not be followed unthinkingly. However, many aspects of their practice could still be successfully applied today. Today, war games are being improved and developed in the German armed forces and used in the military training program. As an example of the modern implementation of war games, the authors of this article cite war games of the German Armed Forces in Wiesbaden in cooperation with the Naval Postgraduate School from the USA, which was conducted as part of the introductory analytical war games course (Mort & Thomas, 2021).

4.2. Wargaming in the USA

War games have been used in the US armed forces for many years. These games are used to formulate policy guidelines, but more often, the guidelines and assumptions of one's policy are used to create suitable wargame scenarios (Matković, 2003). The previous chapter highlighted the origins of the modern system of war games, which spread from Germany throughout the world, including the USA. During the war games, simulations performed on the table and the map as visual tools for playing out strategic scenarios evolved into computer simulations. Nevertheless, the same approach is still used today at military academies and schools. War games declined until 2015 when wargaming application games increased significantly (Appleget, Burks & Cameron, 2020).

The RAND Corporation (Bennet et al., 1988) worked on a model that would represent battlefield-level warfare in a form that would allow for mathematically more accurate actions than those performed on a table or in a sandbox, as well as in board games with historical simulations. This model was developed for the RAND Strategy Assessment System (RSAS) for the needs of the US

Department of Defense. The creation of the model confirmed the ongoing dilemma of the simulation creators mentioned earlier in this paper of whether to enrich the simulations with more parameters or exclude unnecessary details to understand the strategic decision-making level better. More details about the model itself can be found in the RAND document. It is good to know, according to McLeroy (2008), that the first computer simulation models appeared in 1948 in the form of the "Air Defense Simulation" and in 1953 in the form of the "Carmonette" simulation at Johns Hopkins University. Subsequently, new models were further developed and improved as computer technology and scenario modeling for war games progressed.

Today, war games are used in several institutes in the USA and military academies. In addition, the market for and interest in war games has developed worldwide, and researchers and developers are now faced with the challenge of developing game-based software that can be used worldwide as the demand for them grows. Computer models allow the unit-level creation of different simulations McLeroy (2008). War games are present at all levels in the USA. Bartels (2020) discusses that when we think of the impact of war games, we imagine operational warfare or strategic crisis management games.

In contrast to such an approach, the application of games to the internal politics of the Ministry of Defense can also offer a strategic advantage. Using wargaming models, it is possible to simulate the defense procurement system and personnel management, which have long been considered areas needing reform as costs and man-hours have continued to rise. New approaches to playing out different situations in these areas can offer early insights into potential challenges and provide valuable feedback to organizational leaders on decisions before high costs are incurred. War games can provide organizations with insights into the creation of future force structures and are used to assess military courses of action (U.S. Department of Defense, 2020). According to Bartels, these insights are precious when designing and implementing new policies to reform the existing system. Because of the scale of the desired change, historical data on past performance is a relatively poor guide to how new policies will work. War games are used in parallel with other types of exercises because they provide decision-making experience with fewer resources than other types of exercises. War games determine actions that should be carried out; emulators can judge how well (Appleget, Burks, & Cameron, 2020).

It can be concluded that war games are ubiquitous in the US defense system at different levels of decision-making and that different models are being developed to enable modeling and the implementation of different simulations that can lead to better decisions.

4.3. Wargaming in NATO

Operational Experimentation (OPEX) was developed in the NATO Allied Command Transformation (ACT) structure. OPEX is responsible for experimentation and uses controlled research to generate evidence for developing new concepts, ideas and capabilities. In addition to its operational role, OPEX works extensively with field officers and specialist experts such as NATO forces, civilians, academic community members, industry and other international and non-governmental organizations. Conducting various experiments helps the Alliance better understand possible scenarios and their success or failure in implementation (NATO ACT, 2022).

This organizational unit at NATO ACT has played a significant role in the past few years concerning Russia since 2014 and the annexation of Crimea as part of the modern territory of Ukraine. The need for analyses, assessments and playing out scenarios has been emphasized since the Russian aggression on the entire territory of Ukraine. For this reason, OPEX was given an even more critical role and, through an organizational transformation, became the Experimentation and Wargaming Branch (EWB).

It is clear from the available sources that EWB transforms the Alliance by conducting experiments or research and war games. Experiments represent controlled research that obtains appropriate evidence supporting the development of new concepts, ideas and abilities. Through collecting and obtaining information, testing hypotheses and final validation, such research supports reducing uncertainty, identifies possible solutions that may not be clear only through study and analysis, and provides objective assessments of innovations as new solutions.

In wargaming, EWB involves scenario models where the outcome and sequence of events are influenced by and are affected by the players' decisions. The objective is to develop wargaming capabilities and practices that enable NATO's competitive advantage today and, in the future, characterized by the creation,

detection and exploitation of opportunities in a secure environment using analytical rigor to inform political decision-making and military actions at strategic as well as operational and tactical levels. B plans designs, conducts, and analyses war games with partners from the NATO command and force structure, states, research and academic institutions and industry (NATO, 2022).

In his recent address to the Croatian Defense Academy, General Lavigne, Commander of NATO ACT, emphasized the importance of developing this capability in the Croatian Armed Forces as part of the "Wargaming Initiative NATO 23" project. In the following months, it will be of great interest to follow the development of wargaming capabilities both at the national and NATO international level.

5. WARGAMING IN CROATIA

In the Ministry of Defense (MoD) and the Armed Forces of the Republic of Croatia (CAF), war games have been used for several years and with different oscillations. The only decision game that applied until recently was the TEMPO game. It is used in classes as part of "Planning and defense resources management," the graduate study in the fifth year of studies in Military Engineering and Military Leadership and Management (HVUa, 2021). Both study programs are characterized by their interdisciplinary nature, with a significant share of common subjects aimed at developing the critical thinking of the future officers of the CAF. Along with graduate programs, the TEMPO game is applied in implementing the lifelong learning module for Strategic planning. The module is organized and implemented for the members of the MoD, General Staff, CAF, Ministry of Foreign and European Affairs and Ministry of Interior (MORH, 2020). The two-week module is conducted for officers and civil servants who hold the highest positions in the Ministry of Defense and CAF and other ministries of the Republic of Croatia. The program included strategic reflection, planning and management, and decision-making at the strategic level and the implementation TEMPO game.

In the following text, we will describe efforts to expand war games, starting from NATO Science and Technology Organization (NATO STO) project to implement war games to our application of war games in military officers' education.

At the scientific level, the Centre for Defense and Strategic Studies of the Croatian Defense Academy "Dr. Franjo Tuđman" (CDSS-CMA) launched the NATO STO scientific project "Preparation and implementation of educational war games at the operational and strategic level" (MORH, 2022). A three-member team was formed as the nucleus for establishing a dedicated organization for war games, and its exceptional engagement, achieved the formal support of the NATO STO and the mentor nation - the USA - which bore the costs of wargame skills over three years. The main objective is to train and organize the CMA team to design and implement the "War games." The role of this team is to represent the practical capability to test development studies, analyses, military advice, proposals and other processes and products before making final military strategic decisions to support the implementation of all three missions of the Croatian Armed Forces. Given the invested professional and financial resources of NATO and the USA, it was proposed, at the suggestion of the Mentor Nation, that a particular organizational unit - the War Games Department or Laboratory - be established within CDSS-CMA. By being integrated into the Alliance's area of expertise, the project represents developing a strategic culture in the broadest national sense.

The main benefit of the proposed project is the development of the CAF's capability to design and conduct war games and thereby test proposed solutions during the educational process, the training process, and the process of creating concepts, plans, doctrines, and military strategic documents. The project allows the CAF to test new concepts, plans and decisions at the operational and military strategic levels. The ultimate goal is to support the development of the CAF into a state instrument that will effectively fulfill all three of its assigned missions in the conditions and challenges presented to the CAF, both at present and in the future.

Upon completion of the project, it is planned to develop the CMA wargame team further and procure computer-aided simulation systems. The computer-aided simulation systems of the military strategic/operational level would enable CAF to test proposed solutions while drafting concepts, plans, doctrines and military strategic documents using scientific methods in compliance with professional rules.

5.2. Methodology of wargame implementation in officer education

One of the first conclusions of conducting test war games is that older players, i.e., decision-makers who have never been educated in war games, find it challenging to adopt the rules of war games. Our goal is for future leaders, i.e., decision-makers, to develop the culture of war games gradually. Our methodology is to face cadets with simple commercial and military war games. Then, since military officers undergo different educations every 3 to 7 years, we integrate professional war games at each level of education. The basic idea is that if the concept of war games is introduced earlier, then in the long run, the time needed to get used to the concept and learn the rules will be reduced. This is an ongoing research project, and the full results will be published in a later study.

In this research phase, wargaming is implemented for two levels of education: for cadets and for Command and General Staff College (CGSC). For the cadets along with the TEMPO, we use the Strategic military-economic game "Axis & Allies: 1942" (Larry, 2009), and as a part of the course "Fundamentals of military branches and Services use" (HVUb, 2021), dedicated military games based on OWS system. The goal is to show cadets different aspects of wargaming and possible military use cases for later in their careers. At CGSC (officers with 10 to 15 years of experience), we use internally developed OWS military war games designed to apply theoretical knowledge gained at college and practice decision-making. At the end of each gaming session, participants evaluate the game experience through a questionnaire.

The initial feedback is positive from the perspective of students and teachers. However, the study's full results can only be expected in several years. Early results show that the younger generations learn the rules of the game faster and accept the abstractions, that is, the limitations of game mechanics suggesting that our initial hypothesis is correct – for wargaming to be practical, it needs to be introduced gradually through military education.

6. CONCLUSION

Based on this research and attempted research, it is recognized that game theory is used to model decision-making scenarios relevant to application in the defense system. Game theory has proven to be an effective tool for modeling

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decision-making. It is used to model scenarios from different areas. In the field of national defense, there is a continuous need to model and predict the adversary. This paper provides a structured overview of game theory and wargaming as a decision-making tool. In Croatia, game theory and various models are used in the economy as a basis for decision-making in the market. In the field of national defense, game theory and decision-making are still at an early stage and in their infancy. Until recent efforts to expand wargaming application in education of military decision makers, the only game was the game of strategic decision-making, conducted in the fifth year of military studies at the CMA. War games are being expanded and integrated into cadet graduate programs and military officers' education at all levels to create a foundation for the culture of war games among military decision-makers. Early results indicate that this systematic approach helps with a better understanding and future application of war games. Wargaming in Croatia is currently in the early stages and development process.

This process aims to create a solid base of experts and specialists for conducting and managing war games, who will be able to independently create different scenarios for training users in the defense system and involve them in the different levels of military and specialist training of armed forces. However, there is still much room for further research in this area, especially for application in a national context.

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CONSEQUENCES OF CRISIS ON HEALTHCARE SYSTEM EMPLOYEES

Ivana STANIĆ, Ph.D.
University North Varaždin, Croatia

E-mail: istanic@unin.hr

Abstract

Effective internal communication plays an essential role in the sustainability of the healthcare system. One of the roles is internal psychological and sociological support to human resources during a crisis, which indirectly affects the functioning of healthcare system institutions. Healthcare institutions faced numerous challenges and problems during the crisis (the COVID-19 pandemic), and the effectiveness of human resources was expected to be prompt and efficient. Employees in healthcare organizations operated in restrictive conditions to which they had to adapt due to an unexpected crisis. This paper investigates the consequences of a crisis on human resources in the healthcare system. The paper aims to investigate the factors that contributed to internal communication during the crisis caused by the COVID-19 pandemic. The research presented in this paper included a sample of 187 healthcare professionals. The hypothesis explained in this paper is that support within an organization constitutes a prerequisite for preserving human resources in a crisis.

Keywords: healthcare professionals, crisis, internal communication, organization within the healthcare system

JEL Classification: D83

1. INTRODUCTION

Each system within an individual country, from education, and the judiciary to the healthcare system, represents a part of the identity of an individual country and, as such, contributes to its reputation among other countries and peoples. In Croatia, the healthcare system is organized based on the Bismarck model, which rests on the principles of reciprocity and solidarity. The Bismarck model is based on mandatory, universal social security and is characteristic of

most continental European countries (Ginsburg, 1992: 91). The healthcare system in Croatia has undergone. It is undergoing reform to improve the healthcare system and the residents' healthcare. However, in 2020, since the pandemic caused by COVID-19 was declared, the entire healthcare system in the world, in Europe, in developed and underdeveloped countries, has found itself in a crisis during the COVID-19 pandemic that has placed new demands on healthcare professionals.

The crisis required quick action and good corporate communication among all stakeholders to organize the entire system successfully. Effective crisis management can be realized if we adhere to several accepted principles of crisis management: facing reality, quick and decisive action, protecting people as an absolute priority, presence of leaders at the scene and open communication. (Kešetović & Korajlić, 2008: 147). Pollardi and Hotho (2006) state that the essential prerequisite for effective crisis management is decision-making in the context of an organization's good preparedness for crises. A crisis is an unpredictable, unplanned and unwanted event that can negatively affect the organization's operation (Kešetović & Toth, 2012).

Any management of a crisis requires communication skills from the management. For the communication process to be effectively managed by an organization's management in a crisis, internal communication is essential, which constitutes a part of corporate communication. Throughout the years of research, numerous theorists have offered definitions of internal communication and different names, such as organizational communication, communication with employees, etc. (Welch & Jackson, 2007). Borovec et al. (2011) claim that internal communication is the process of creating and exchanging messages within a network of interdependent relationships to help resolve uncertainty in the environment (Borovec et al., 2011: 9). It can be said that internal communication is a term used to describe a system of organizationally managed communication in which employees are considered the most important target groups and is often defined as the planned use of communication actions to systematically influence the knowledge, attitudes and behaviors of current employees (Šutalo, 2017). Communication encompasses all communication relationships between employees within the organization, i.e., a healthcare institution. Internal communication during a crisis is essential since it facilitates organizational communication and contributes to achieving set goals, tasks and employee motivation. It is an indispensable segment of interaction between employees who are hier-

archically distributed on the same or different levels within an organization, and it is necessary to talk about the importance and role of internal communication during a crisis. Internal communication is reflected through the working environment and working climate in all situations, including a crisis, and is accompanied by employee communication relationships, on which work performance, psychological status and employee satisfaction depend.

The paper aims to investigate the factors that contributed to successful internal communication during the crisis caused by the COVID-19 pandemic.

The subject is determining which factors are reflected among employees during a crisis.

An insight into the published works of previous research and the application of the compilation method demonstrated the significant role of healthcare workers in the functioning of healthcare systems during the COVID-19 pandemic. Therefore, the research will focus on reviewing the status of the CO-VID-19 pandemic crisis caused to healthcare employees. The paper provides an answer to how the crisis caused by the COVID-19 pandemic affected healthcare system employees worldwide in terms of interpersonal relationships, mental health, and the emergence of psychosomatic symptoms.

The main research question that the research in the paper will answer is whether the crisis caused by the COVID-19 pandemic is related to the health status of healthcare employees in the Republic of Croatia, and a hypothesis is that the health status of employees is significantly impaired during the CO-VID-19 pandemic. The second research question that will be answered in this paper will answer whether support was provided to employees and how was the said support provided to employees during a crisis. From the above, the hypothesis emerges that support during a crisis is essential for preserving the psychological status of healthcare professionals.

With the goal of a more comprehensive approach, this research, using the synthesis method, tried to integrate existing theoretical and empirical knowledge on the existence of consequences on the health status of employees and the support provided within an organization. Based on the conducted research and the discovery of new knowledge in the research that will be presented in this paper, an attempt will be made to present the knowledge that has been obtained in order to point out the importance of support in a crisis with an emphasis on the orientation towards employees in the context of support.

2. THE ROLE OF INTERNAL COMMUNICATION DURING A CRISIS

Crises differ in their characteristics, such as cause, duration, intensity, etc. The literature lists three essential characteristics common to every crisis: threat, uncertainty and time pressure (Keštović & Toth, 2012). Given that it is impossible to determine all types of crises, it is also impossible to determine all possible causes. However, it is possible to group them into two primary groups: external and internal causes (Legčević & Taučer, 2014). External causes of a crisis are those related to changes in the environment, which an organization can hardly influence, and include events such as natural disasters, political changes, economic crises, changes in the market etc. (Legčević & Taučer, 2014). On the other hand, internal causes of a crisis are those that have arisen within an organization itself and can be managed and controlled by the management and can be manifested through poor interpersonal relations, an unfavorable leadership style, excessive competition between colleagues, poor formal and informal communication etc. (Legčević & Taučer, 2014). Regardless of when and under what conditions it occurs, the manager's role, i.e., the director in a healthcare institution, must apply crisis management skills.

During the COVID-19 pandemic, healthcare institution directors were expected to make quick decisions and act quickly during a crisis. Decisions in the Republic of Croatia were initially made at the state level by the Civil Protection Headquarters. They were implemented at the regional headquarters and institutions level, and later, as the crisis continued, more and more powers were granted to the headquarters at the regional level. However, there was still a national level of decision-making in which departmental institutions were involved. Healthcare institution directors received daily decisions and guidelines on how to organize operations. However, the issues were reflected in the fact that many institutions had to be coordinated, and therefore internal communication played a crucial role in effectively managing a crisis and employees. It is worth pointing out that the crisis mentioned above highlighted the shortcomings of the then Healthcare Act (Official Gazette No. 100/18, 125/19, 147/20), according to which the healthcare institution directors did not have to have competencies in the field of health management, which, according to Article 85 (Official Gazette No. 100/18, 125/19, 147/20, 119/22, 156/22, 33/23) of the Healthcare Act in force today, they must have. Therefore, it can be concluded that this crisis contributed to changes in legislation.

Regarding the relationship between employees and directors and between employees during a crisis, the purpose of internal communication is more emphasized. The reason for this is given in a paper by David (2011) in which the author claims that internal communication reduces the possibility of overcoming negative feelings among employees during a crisis, i.e., it ensures that such feelings do not grow into something more so that they do not affect an organization's effectiveness. It also ensures that employees are well informed, which is crucial in crisis so that employees feel safe and create a perception that an organization is managing the new situation well (David, 2011).

2.1. Consequences of the crisis on Healthcare professionals – literature review

By studying the impact of the crisis caused by the COVID-19 pandemic, the symptoms and consequences of employees in the healthcare system who worked with different groups of patients are observed. The most commonly observed phenomena include anxiety, stress, depression and insomnia, which points to mental health issues caused by a crisis. Some of the research confirms this. In a Luceno-Morena et al. (2020) study, 79.3% of participants declared they felt anxiety. Up to 74% (Maraqa et al., 2020) of the respondents claimed they experienced stress.

Furthermore, in a study from Asia, depression prevalence rates ranged from 5.3% (for the least moderate depression) to 50.4%. (Ng et al., 2020). Insomnia was reported by 50.4% of respondents in a study conducted by Sahina et al. (2020), and the presence of depression was reported in up to 77.6% of employees. In Italy, a study was conducted in which it stated that 49.38% of healthcare professionals reported symptoms of posttraumatic stress, 24.73% reported symptoms of depression, 80% reported symptoms of anxiety, 8.27% reported symptoms of insomnia, and 21.90% reported symptoms of stress (Rossi et al., 2020). These and similar symptoms and consequences have been observed in healthcare professionals in Nepal. Among healthcare professionals in this study, it was found that 28.9% of respondents felt symptoms of stress, 35.6% felt symptoms of anxiety, and 17% felt symptoms of depression (Pandey et al., 2021). A review of previous research shows a significant impact on employees' health, which points to preventive measures that can reduce the impact on employees' health during future crises.

2.2. THE IMPORTANCE OF PRESERVING THE PSYCHOLOGICAL STATUS OF EMPLOYEES – LITERATURE REVIEW

In their research, Temsah et al. (2020) conclude that diseases such as CO-VID-19 or MERS-CoV impose significant anxiety and stress on healthcare professionals who care for infected patients. They found that healthcare professionals are most concerned with the risk of disease transmission to family members and themselves. According to them, the solution is reflected in employee prevention and infection control measures to ensure their safety, reduce the probability of infection or transmission of infection to others, and alleviate their psychological stress and anxiety. A study conducted by Sugg et al. (2020) contributes to the research field of mental health, psychosocial resources and positive psychology during a global pandemic by providing evidence according to which social support and general optimism represented important protective variables for depressive and anxiety symptoms in healthcare professionals in Germany during the COVID-19 pandemic. This study hypothesizes that the significance of gender, change of work department and direct contact with patients infected with COVID-19 is less critical concerning depression and anxiety. Despite this, it has been found that females, change of work department and direct contact with patients infected with COVID-19 are positively associated with symptoms of depression and anxiety. When we focus on possible risk groups among healthcare professionals, we should not forget those with the pre-existing disease since they are at risk from multiple perspectives: from a medical perspective when they contract COVID-19 and from a psychosocial perspective, and thus are more likely to show the symptoms of depression and anxiety (Schug et al., 2020: 14).

During any crisis, the role of a manager who encounters difficulties within their organization regarding human resources in crisis is essential and not to be neglected. Examining research on workplace resilience and leadership (i.e., team, transformational, shared, and crisis leadership), Reyes et al. (2021) highlight six critical factors for healthcare leaders to help their teams during a crisis. The six key factors during a crisis are optimism, adaptation, human resources support, presence, empathy and transparency. Each of the mentioned factors has its role during a crisis, and it is up to a leader to recognize and apply them to support their employees as successfully and efficiently as possible. For example, managers' presence among employees helps support employees, recognize needs and facilitate understanding and compassion in crisis. Daily communication

with employees enables faster adaptation to changes. As a result of the above, it can be concluded that the responsibility and burden are multiple for a manager, especially in long-term and uncertain crises such as the COVID-19 pandemic (Reyes et al., 2021). This requires the entire organization to adapt to the crisis and focus on employees, among whom internal communication should be encouraged. The above is confirmed in a study conducted by Paquay et al. (2023), who conducted a survey of 98 nurses and physicians and concluded that for successful management during a crisis in an organization, leadership transformation ability, transparent operational procedures, information flow, as well as equal support for employees in such a way that they feel encouragement, motivation and togetherness in their work are essential.

Based on the research, this paper will present new findings focused on health, communication and support in a crisis for healthcare professionals.

3. METHODOLOGY

The data used in the research were collected utilizing a survey questionnaire among employees working in healthcare institutions at the primary care level. The survey questionnaire was created for this research to show the respondents' attitudes regarding the actions within a health organization during the crisis. It consisted of two parts. The first part focused on the socio-demographic characteristics of the respondents, which were made up of three independent variables. In addition, the survey questionnaire contained 17 closed-ended items of the Likert scale, comprising two dependent variables. The research was conducted from September 2 to November 2, 2022. The survey questionnaire was anonymous, and all data were collected using the Google Forms application and distributed to healthcare institution employees via various digital platforms, thus ensuring the respondents' anonymity. The research was conducted on an appropriate sample of 187 healthcare professionals working in healthcare institutions at the primary care level in the Republic of Croatia. All collected data were processed using IBM SPSS Statistics statistical software, while descriptive statistics and Pearson's correlation coefficient were used as statistical methods.

4. RESULTS AND DISCUSSION

The survey consisted of 187 respondents, healthcare professionals from the Republic of Croatia who work in healthcare institutions at the primary care level. Analysis of socio-demographic data showed that of the total number of respondents (N=187), there were 140 (74.9%) women and 47 (25.1%) men. In terms of age, 52 (27.8%) were between 21 to 30 years of age, 47 (25.14%) were between 31 and 40 years of age, 33 (17.66%) were between 41 and 50 years of age, 43 (23%) were between 51 and 60 years of age and 12 (6.4%) were between 61 and 65 years of age. The level of education indicates that 87 (46.5%) have completed secondary education, 18 (9.6%) respondents have a higher vocational education, 80 (42.8%) respondents have a university degree, and 2 (1.1%) have a post-graduate degree.

Table 1 gives an overview of the responses provided by the respondents, which shows the respondents' attitudes. The results obtained through items support H1. Table 1 shows that healthcare professionals evaluated their attitudes toward their situation with a score ranging from 1 (I completely disagree) to 4 (I agree) according to the Likert scale. Data analysis shows that the average score ranged from 2 (I somewhat agree) to 3 (I mostly agree). As seen from the table, healthcare professionals least agree with the statement that they felt lonely during the pandemic, which is to be expected since they were in constant communication with other employees. Most of them describe their condition during the COVID-19 pandemic in terms of increased fatigue and agitation, which is reflected in the health status of healthcare professionals. A review of 46 qualitative studies that investigated the views of healthcare professionals reached the same findings, i.e., that healthcare professionals faced heavy workloads, worked long shifts, and wanted adequate rest and recovery (Billings et al., 2021). However, due to the restrictive working conditions, shift work, and reduced work capacity caused by contracting COVID-19, this is expected and indicates that we have to consider how to provide support to healthcare professionals over a more extended period since we are facing further waves of COVID-19, but also for future health crises (Billings et al., 2021).

Table 1. The status of healthcare professionals during the crisis caused by the COVID-19 pandemic

Item	1- I completely disagree	2- I somewhat disagree	3- I mostly agree	4- I completely agree	M	Sd
I felt lonely.	111 (59.4%)	46 (24.6%)	20 (10.7%)	10 (5.3%)	1.62	0.880
I felt anxious.	77 (41.2%)	61 (32.6%)	33 (17.6%)	16 (8.6%)	1.94	0.965
I felt afraid.	64 (34.2%)	69 (36.9%)	36 (19.3%)	18 (9.6%)	2.04	0.961
I felt insecure.	64 (34.2%)	64 (34.2%)	41 (21.9%)	18 (9.6%)	2.07	0.973
I felt agitated.	53 (28.3%)	74 (39.6%)	42 (22.5%)	18 (9.6%)	2.13	0.938
I experienced increased fatigue.	47 (25.1%)	37 (19.8%)	60 (32.1%)	43 (23.0%)	2.53	1.104
I suffered from insomnia.	96 (51.3%)	41 (21.9%)	31 (16.6%)	19 (10.2%)	1.86	1.035
Valid N (list-wise)	187					

Source: by the author

In Table 2, Pearson's correlation coefficient shows the significance of individual items in a variable referring to the status of healthcare professionals during a crisis. Further data processing included calculating correlations between various aspects of health status, i.e., how the items correlate. According to Table 2, it can be seen that various health status aspects are highly correlated, and all correlations are significant, i.e., as the level in one item that measures health status increases, so does the level in other items. The highest values in correlations are observed for items that measure fear and anxiety, i.e., as the level of fear increases, so does anxiety—furthermore, the level of fear and anxiety correlate. Among the correlation values, the level of fear and fatigue has the lowest values, but it turned out to be statistically significant. Preparing healthcare professionals for future crises is one of the measures that can contribute to the health status of healthcare professionals. Given that H1 was confirmed, it is essential to strengthen the enthusiasm, knowledge and awareness of healthcare professionals in crisis (Wong et al., 2007) to influence their mental and physical health during and after the crisis.

Table 2. Correlation of the status of healthcare professionals during the crisis caused by the COVID-19 pandemic

Correlations

	I felt afraid. Pearson Correlation	I felt agitated. Pearson Correlation	I felt insecure. Pearson Correlation	I felt anxious. Pearson Correlation	I felt lonely. Pearson Correlation	I experienced increased fatigue. Pearson Correlation	I suffered from insomnia. Pearson Correlation
I felt afraid.	1	,799**	,681**	,757**	,484**	,318**	,450**
I felt agitated.	,799**	1	,732**	,764**	,479**	,445**	,458**
I felt insecure.	,681**	,732**	1	,675**	,477**	,376**	,432**
I felt anxious.	,757**	,764**	,675**	1	,579**	,456**	,583**
I felt lonely.	,484**	,479**	,477**	,579**	1	,335**	,459**
I experienced increased fatigue.	,318**	,445**	,376**	,456**	,335**	1	,515**
I suffered from insomnia.	,450**	,458**	,432**	,583**	,459**	,515**	1

**, Correlation is significant at the 0.01 level (2-tailed).

Source: by the author

The results presented in Table 3 support H2 since they indicate the importance of the support provided in a healthcare institution, all for preserving healthcare professionals' health status.

In Table 3, it can be seen that the healthcare professionals stated what contributed to their psychological status during the crisis in which they were and evaluated the same with a grade from 1 (I completely disagree) to 4 (I completely agree) according to the Likert scale. Data analysis shows that the average score ranged from 2 (I somewhat disagree) to 3 (I mostly agree). Considering the results, it is clear that very few respondents were provided professional help and support by psychologists and psychiatrists during the pandemic. Providing psychological help or support is essential for the continued work of healthcare professionals during and after a crisis to preserve the health status of healthcare professionals, without which the healthcare system cannot function effectively. In their research, Billings et al. (2021) discuss the importance of preserving a psychologically healthy workforce for the well-being of employees and the sustainability of healthcare services globally (Billings et al., 2021). The results indicate that communication with colleagues at work contributed the most to healthcare professionals" psychological status. This confirms the importance of internal communication between all employees working in an organization. Only good internal communication can help an organization develop and achieve positive business results, which is crucial for every organization (Mihalinčić, 2018: 15).

Table 3. Contribution to the psychological status of healthcare professionals

Items	1- I completely disagree	2- I somewhat disagree	3- I mostly agree	4- I completely agree	M	Sd
Help and support from a psychiatrist.	154 (82.4%)	16 (8.6%)	8 (4.3%)	9 (4.8%)	1.32	0.770
Help and support from a psychologist.	145 (77.5%)	14 (7.5%)	12 (6.4%)	16 (8.6%)	1.46	0.946
Communication with patients.	48 (25.7%)	58 (31.0%)	58 (31.0%)	23 (12.3%)	2.30	0.987
Communication with a physician.	63 (33.7%)	40 (21.4%)	46 (24.6%)	38 (20.3%)	2.32	1.142
Communication with superiors.	45 (24.1%)	40 (21.4%)	55 (29.4%)	47 (25.1%)	2.56	1.112
Informing on the development of the COVID-19 pandemic through the media.	34 (18.2%)	35 (18.7%)	68 (36.4%)	50 (26.7%)	2.72	1.052
Help and support from colleagues at work.	36 (19.3%)	30 (16.0%)	56 (29.9%)	65 (34.7%)	2.81	1.124
Help and support from superiors.	36 (19.3%)	39 (20.9%)	53 (28.3%)	59 (31.6%)	2.72	1.106
Communication with colleagues at work.	23 (12.3%)	43 (23.0%)	68 (36.4%)	53 (28.3%)	2.81	0.987
Valid N (list-wise)	187					

Source: by the author

In Table 4, Pearson's correlation coefficient shows the significance of individual items in a variable referring to the contribution to the psychological status of healthcare professionals during the crisis.

Data processing included the calculation of correlations between various aspects of the contribution to the psychological status, i.e., how the item correlate with each other. As for the aspects of support and communication, the highest correlation was obtained for the items of support and communication with a psychologist and psychiatrist, i.e., with the increase in the level of support provided by a psychologist, the level of support provided by a psychiatrist also increases. On the other hand, a more negligible correlation was obtained between the help provided by psychologists and the help provided by a physician. Furthermore, as communication with colleagues at work, with superiors, with patients, and with physicians grew, so did information on the development of the COVID-19 pandemic through the media.

Table 4. Correlation of contribution to the psychological status of healthcare professionals

Correlations

	Informing on the development of COVID-19 pandemic through the media. Pearson Correlation	Communication with colleagues at work. Pearson Correlation	Communication with superiors. Pearson Correlation	Communication with patients. Pearson Correlation	Communication with a physician. Pearson Correlation	Help and support from superiors. Pearson Correlation	Help and support from a psychologist. Pearson Correlation	Help and support from a psychiatrist. Pearson Correlation	Help and support from colleagues at work. Pearson Correlation
Informing on the development of COVID-19 pandemic through the media.	1	.444**	.402**	.413**	.303**	.311**	.029	-.050	.267**
Communication with colleagues at work.	.444**	1	.037**	.490**	.479**	.309**	-.026	-.005	.349**
Communication with superiors.	.402**	.037**	1	.526**	.627**	.463**	.140	.061	.348**
Communication with patients.	.413**	.490**	.526**	1	.706**	.338**	.105	.087	.280**
Communication with a physician.	.303**	.479**	.027**	.706**	1	.418**	.174*	.082	.278**
Help and support from superiors.	.311**	.309**	.463**	.338**	.418**	1	.252*	.211*	.566**
Help and support from a psychologist.	.029	-.026	.140	.105	.174*	.252*	1	.781**	.134
Help and support from a psychiatrist.	-.050	-.005	.061	.087	.082	.211*	.781**	1	.176*
Help and support from colleagues at work.	.267**	.349**	.348**	.280**	.278**	.566**	.134	.176*	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Source: by the author

The listed results from Tables 3 and 4 confirm the importance of support, help and communication to healthcare professionals. During a crisis, internal communication ensures that healthcare professionals are informed more quickly and creates a sense of security among healthcare professionals. In this way, healthcare professionals perceive that the organization's management in the new situation is good (David, 2011) and that they are supported. Support during a crisis is essential for preserving the psychological status of healthcare professionals, which is evident from the results obtained in this research, and it can be concluded that H2 is confirmed.

4.1. RESEARCH CONTRIBUTION

The implications of the conducted research indicate several negative factors that affect the health status of employees during a crisis. The employee's health condition was impaired despite the employee being supported by professional services, colleagues or superiors. It can be concluded that it is necessary to implement prevention measures to timely prepare employees to cope with the workload in a crisis. However, even in the strategic plan for action in a crisis, it is necessary to foresee activities and measures that will place more attention and focus on human resources.

This research can be a starting point for further research that will determine to what extent employees' health is impaired during a crisis and whether there was a positive effect of the support provided to employees in crisis.

4.2. Research limitations

The research has certain limitations primarily because it was conducted on a limited sample of participants (a total of 187) who participated in the research voluntarily. However, this is acceptable since it is a convenient sample of healthcare professionals who work in healthcare institutions at the primary care level in the territory of the Republic of Croatia. It is believed that the limitations of this research do not affect the objectivity of the research and its credibility.

5. CONCLUSION

Each crisis introduces inevitable consequences but also contributions in the context of knowledge and experience for future crises.

Reviewing previous research and research in this paper confirms significant consequences on employees' health during the crisis, which was expected considering that the COVID-19 pandemic spread rapidly both around the world and in the Republic of Croatia. It is considered essential to note that the consequences on employees' health are primarily reflected in the mental health of employees. It was necessary to preserve the will and perseverance of healthcare professionals during a crisis such as the COVID-19 pandemic, which caused fatigue, exhaustion and workforce shortages among healthcare professionals. It concludes with the critical detection of factors (fatigue, exhaustion, insomnia) that enable health institution directors to develop strategic plans or guidelines for future crises. Furthermore, support during a crisis is essential for preserving the psychological status of healthcare professionals, which is confirmed by the employees in this research who sought support or communication during a crisis to cope more easily with the crisis. Despite the support provided during the crisis, the employees experienced consequences to their health. Therefore, the contribution of this paper is in the recognized need to review the procedures and actions of employees during crises. This research can be a starting point for further research that will determine to what extent employees' health

is impaired during a crisis and whether there was a positive effect of the support provided to employees during a crisis.

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CLARITY OF ORGANIZATIONAL CHANGES GOALS AS A DETERMINANT IN EMPLOYEE BEHAVIOUR

Sanja GUTIĆ MARTINČIĆ, Ph.D.
EFFECTUS University of Applied Sciences, Zagreb

E-mail: sguticm@effectus.com.hr

Abstract

The paper is directed towards an interdisciplinary approach in which it is desired to point out the role and contribution of psychology in positioning employees' attitudes in organizational change management. Numerous studies have confirmed that organizational changes do not occur efficiently without difficulties and resistance from employees. However, there are relatively few that delve more dubiously into the causes of them. The research aims to prove that the clarity of the goals of organizational changes defined by the leaders directly affects the formation of positive or negative attitudes of employees towards these changes. Unclear, hidden, and confused goals lead to negative emotions and resistance to change. The research was conducted on a representative sample of 120 respondents. A five-point Likert scale with 16 defined statements was constructed specifically for this purpose. The first four statements related to the goals of organizational changes, and the other 12 to the three components of employees' attitudes. The determined partial correlation coefficients point to several conclusions. The respondents did not understand and accept the goals of the changes. Thus they did not even identify with them, which influenced the emergence of negative emotions toward them (value 2.759). A strong interdependence was found between goals and cognitive (r = 0.5507-0.8317), cognitive and affective (r = 0.53-0.85), and affective and conative (r = 0.56-0.81) components attitudes. It is also pointed to the reflection of the negatively formed attitudes of employees (value 2.860) on resistance to organizational changes. The research results should be a clear guide for managers to make a turn in human resources management, where the creation of employees' attitudes should be given a respectable place to make the management of organizational changes more effective and with lower risks.

Keywords: *organizational changes, employees' attitudes*

JEL Classification: *D23, D83, D87*

1. INTRODUCTION

According to research results, approximately two of three organizational change initiatives fail due to negative employee attitudes and unproductive management behavior. Organizational changes can stress employees, causing them to have less trust in their employers and a greater desire to find new jobs. Employees affected by the change are more than twice as likely to suffer from chronic stress. Specifically, 55 percent of employees who experienced recent or immediate change reported prolonged stress, compared to only 22 percent of those who had no recent, current, or anticipated change (Walker et al., 2007: 768). Of the employees who experienced change, 43% said it negatively affected their perception of the company, 40% said it negatively affected their health and well-being, and 30% said it affected their work performance. (Walker et al., 2007: 769). Fortune 500 CEOs once said that employee resistance is the main reason change fails. Moreover, 80% of CIOs said that resistance, not a lack of technical skills or resources, was the main reason technology projects failed (Cameron & Green, 2019: 162).

Resistance, however, is not the primary, but rather symptomatic, reason why change fails. The real problem is that change project managers plan and execute significant changes in ways that create inertia, apathy, and opposition among employees. Resistance to change is a reaction to the way change is managed. The better we understand what causes resistance, the easier it will be to build support for our ideas. There has always been and will be resistance to change because it is like people to be afraid of the new and insufficiently known, and eliminating them will never be possible. Several different negative emotions among employees always accompany resistance to change. This work tries not to observe these emotions in isolation but as part of attitudes where they are one of the three components of the same, which is realistic. Focusing on the goals of organizational changes as an essential factor in forming the cognitive component of attitudes, an attempt is made to contribute to efforts to make change management more efficient.

2. LITERATURE REVIEW

2.1. Organizational changes and employee behavior

Often, employees who do not have all the details start creating and spreading rumors about the company's future. They can hear segments of the change plan

and fill in the details based on the information they have. As they discuss these changes with colleagues, facts can become rumors, fueling additional anxiety and stress. Employees may lose faith in company leadership during organizational change because they sometimes do not fully believe in the goals of the change.

Table 1. Models of organizational changes and employee behavior

Name of the model	The essence of the model	Employee behavior	Source
Lewin's model	Stages of unfreezing, changing, and refreezing state	Spend time accepting new events, developments, and changes	Burke, 2013
McKinsey's model	The model integrates both emotional and cognitive components of changes	Values that guide employees through changes are essential	Hiatt & Creasey, 2012
Nadler's model	Identifies areas of congruence and inconsistency with organizational goals	Considers leadership, beliefs, attitudes, and values	Hiatt & Creasey, 2012
Bridges model	Approach to change management focusing on human resources	Failure to acknowledge feelings leads people to reject impending changes	Bridges & Bridges, 2009
SOCM model	Monitoring the maturation and conversion of damaging to positive emotions of employees	The awareness of employees disrupts their previous mental and physical processes.	Bridges & Bridges, 2009
Scott's & Jaffe's model	Focuses on how people come to terms with change	Includes processes of letting go of the past and the future	Miller & Proctor, 2016
Anderson's & Anderson's model	Comprehensive coverage of the entire change process and the change process as a cyclical process	The readiness for active involvement in the change process identifies them	Anderson & Anderson, 2001
Nudge's model	It refers to the principle that even a small action can influence people's choices in behavior.	Differences in feelings, opinions, and knowledge of human nature and behavior	Thaler & Sunstein, 2008
Maurer's model	Changes will fail due to a lack of information and adverse emotional reactions.	Emotional reactions are a crucial obstacle to implementing changes	Cameron & Green, 2019
ADKAR model	Organizational changes only happen when individuals change	The individual must get every outcome in order for the change to be implemented	Hodges, 2018
Kotter's model	Focuses on the people experiencing the significant changes, not the changes themselves	Bringing together a coalition from different sources and connecting them to a vision	Kotter, 2012
Deming's model	The model is cyclical and iterative for continuous change and improvement	People perform best when they are not afraid to express their ideas or concerns	Deming, 1984

Source: author's research

There has been much research in which many organizational change models have been presented, some of which are shown in Table 1. All models try to identify and position the role and behavior of employees during changes, mainly through the different phases of these changes. Some of them, such as Kc Kinsey's, Nadler's, Scott's and, Jaffe's, ADKAR, try to point out the structures of resistance or support of employees and the strategies and tactics that change managers should apply to implement these changes successfully.

2.2. Objectives of organizational changes

One study found that negative feelings could be attributed to employee skepticism when initiating changes. Almost 30 percent of all surveyed workers said they believe management has a hidden agenda to initiate change, and 31 percent believe employers have different goals and motives for making changes than they say publicly. In addition, 28 percent believe organizations try to hide the fundamental goals and reasons for change (Walker et al., 2007:770). A large number of employees also do not think that the changes will have the desired outcomes. Research has shown that almost 30 percent of employees doubt that the changes will work as intended and that they will achieve the employers' goals (Walker et al., 2007:766).

Table 2. Models for setting organizational change goals

Model name	Short content	Employee behavior	Source
SMART	Specific, measurable, achievable, realistic, and time-limited goals	Recognizable, special, clear, unambiguous	Ogbeiwi, 2017
BHAG	Massive goals that are sufficiently compelling, long-term, and intriguing	An emotional component that pulls people out of the abyss and moves them	Locke & Lathan, 2013
Backward goals	Plan backward, start with the end goal, and then work out the way forward	A clear picture of where we want to be in the future and how to achieve our goal	Park et al., 2017
Goals according to key results	Goals are set quarterly on partial settings	All employees have is just a wish	Irikefe, 2021
Concise goals in one word	The goal technique of choosing only one word and focusing on it	Doubts, pitfalls, and ambiguities lead to goal stagnation	Hoek et al., 2016
Locke's model	Clear goals and feedback motivate employees toward the goals	Challenge, commitment, and task complexity built into goals	Locke, 1968

HARD	Challenging goals intensify the human brain and encourage the performance of goals.	Analytically oriented thinking and finding answers	Roose, 2017
WOOP	Uses a mental approach: confronting the desire with an internal obstacle	Positive thinking leads to the desired outcome	Saddawi-Konefika et al., 2017
The Golden Circle	It consists of three circles: why we have a goal, how to achieve it, and what we will do.	Do not look for why people do, but what they do	Sinek, 2017
The Pyramid Method	At the top of the pyramid is the primary goal. It drives motivation	The reason for supporting a cause is essential, and it moves people	Kenrick et al., 2010

Source: author's research

According to the brief presentation in Table 2, the goals of organizational changes represent a critical driving link in the process of these changes. Not only must they be prominent, comprehensible, recognizable, encouraging, accessible, and unambiguous to employees, but they must participate in forming their mental (cognitive) structure so that they are a support, not a brake, in the implementation of changes.

2.3. Attitudes of employees

It is a well-established and to this day generally accepted claim that attitudes were defined about 70 years ago by Mr. Allport, who then established that they are solid, complex mental products that are composed of three components: cognitive, affective, and conative (Allport, 1972: 37). Recently published papers in the field of employee attitudes research were also noted, of which it is worth mentioning (Andrew, 2017: 12; Soale & Akudugu, 2021: 174; Dartley & Jenkins, 2007: 64). The definition given by Allport has been maintained to this day both in theory and in practice, sometimes with minor modifications, but it is noticeable that the conception of attitudes with application to employees has not yet been sufficiently explored. Even less has it found its purposeful application in managing human resources. Emotions, as an essential component of attitudes, are inherently short-lived and changeable categories in a short time (most often) (Rajah et al., 2011: 1112). This provides a basis for doubting that emotions can be interpreted and creatively managed by employees' resistance to organizational changes. Emphasizing these resistances through emotions cannot make significant progress in managing organizational changes if viewed as

a component of attitudes. The most important answer about the causes of employees' negative emotions remains unanswered.

The goals of organizational changes as a source of knowledge refer to the cognitive component of attitudes, which, as a rule, creates an emotional component, then a conative one, and finally forms the resistance or support of employees to organizational changes. Several studies confirm that attitudes, unlike emotions, are persistent, firm, and permanent mental structures that most often determine certain people's behavior. Negative emotions can be defined as "an unpleasant or unhappy affective construct that appears in individuals to express a negative effect towards an event or person" (Dartley & Jenkins, 2007: 68). Negative emotions as a source of employee resistance to organizational changes can help us understand confusing signals from employees (Kanske & Kotz, 2011). They help us understand inaccessible or conflicting cognitive information.

3. OBJECTIVE AND HYPOTHESES

The research aims to prove that the clarity of the goals of organizational changes directly affects the formation of positive or negative attitudes of employees towards these changes. Following this goal, the following three hypotheses were set:

H1 – The goals of organizational changes form the cognitive component of employees' attitudes.

H2 – Knowledge about organizational changes is reflected in employees' emotions.

H3 – Employees' resistance to organizational changes results from their negative attitudes.

All hypotheses have been processed, and a review of them is given in the conclusion.

4. METHODOLOGY

The primary data for this research was collected through an online survey with a sample size of n=120. The respondents were permanent employees in 16

medium-sized and small companies from various industries in three counties in northwestern Croatia: Zagrebačka, Krapinsko-Zagorska, and Varaždinska. The selection of companies was random. Respondents were taken from an alphabetical list, applying selection steps depending on the company's size. The sample size and sampling technique are based on stratified random sampling, as presented by Cooper and Schindler (2008: 137), in a situation where the population is not homogeneous. The sample includes only those respondents who were exposed to at least one significant organizational change during their employment in that company. The subjective opinion of those companies' management defined the change's significance. Of the sent questionnaires, 96 respondents responded with correctly and wholly filled questionnaires, which can be considered a good selection considering the type of survey. The survey was conducted in the second half of 2022. It was completely anonymous, and the respondents were informed of this before participating in the survey. They were also informed about the purpose of the survey. Secondary data were collected from the human resource management and organizational change databases Scopus, EBSCO, PsycARTICLES, and ScienceDirect. The most frequently represented respondent was female (67.32%), between the ages of 41 and 60 (38.54%), had a secondary vocational education (69.79%), and came from a company with between 31 and 50 employees (36.45%).

The test used the Likert five-point scale method, which is common in this type of research. It contained 16 statements, the first four of which related to the goals of organizational changes, the second four to the cognitive component of the attitude, the third four to the emotional component of the attitude, and the last four to the conative component of the attitude (table 3). The construction of the claims is derived from knowledge published in the cited sources. When determining the statements, the respondents were instructed to try to recall their experiences, roles, and experiences with past organizational changes and focus on only one change that they judged to be the most significant.

Table 3. Statements for constructing a Likert scale

The reason for supporting	Claim	Source
Determining the objectives of organizational changes	1. The goal and meaning of this change were clear to me	Ogbeiwi, 2017 Hoek et al., 2016
	2. I recognized myself, my interests, and my possibilities during the change	Park et al., 2017 Roose, 2017
	3. I understood the good sense and outcome of the change	Saddawi-Konefika et al., 2017
	4. I was aware that the goal of this change was for the benefit of all of us	Locke & Lathan, 2013
Determining the cognitive component of attitudes	5. I was utterly convinced that we needed that change	Hiatt & Creasey, 2012
	6. I was fully aware that this change was something I was waiting for	Bridges & Bridges, 2009
	7. We needed something completely new to be better and more successful	Miller & Proctor, 2016
	8. I was able to express my ideas and concerns during the changeover freely	Deming, 1982
Determining the affective component of attitudes	9. I was not afraid, nor was I afraid of what the change would bring me	Cameron & Green, 2019
	10. I was not disturbed by this change	Bridges & Bridges, 2009
	11. My bosses understood and encouraged me not to be afraid of change	Bridges & Bridges, 2009
	12. I was happy and had hope for a better future after the change	Miller & Proctor, 2016
Determining the conative component of attitudes	13. I supported that change without any hesitation	Bridges & Bridges, 2009
	14. I have shown an apparent and visible willingness and actively involved myself in the change	Anderson & Anderson, 2001
	15. I knew that the outcome of the change would be great, and I gave my support	Hodges, 2018
	16. I got involved in that change as best I knew how	Deming, 1982

Source: author's research

Respondents' levels of agreement with the statements are: 1-do not agree at all, 2-disagree, 3-partially agree, 4-agree, and 5-completely agree. The statements are weighted with weight ratios that have been established and identified with the respondents' scaling degrees. The collected primary data were processed using the software packages Microsoft Excell and SPSS 21.0 (Statistical Package for Social Sciences).

5. RESULTS

Table 4 presents the average values of statements (a), variances (v), minimum values (min), maximum values (max), and Cronbach alpha indicators of consistency of statements (Ca).

Table 4. Average values of claims

Claims	a	v	min	max	Ca
Objectives of organizational changes	2.736	0.1403	2.141	3.417	0.738
The cognitive component of attitude	3.015	0.0658	2.457	3.592	0.860
The affective component of attitude	2.759	0.2260	2.314	3.105	0.812
Conative component of attitude	2.947	0.1576	2.337	3.629	0.749
Attitude of employees	2.860	0.3714	2.462	3.647	0.803

Source: author's research

The respondents did not identify with the goals of organizational changes because they disagreed with them. This can result from the correlation of the average values of cognitive statements in the zone of only partial agreement with the same. Thus the acquired knowledge of what these changes mean and bring to them. It is also necessary to leave open the possibility that the resistance to these changes arose not from acquired cognitive abilities but from the fact that these changes were not in the respondents' interests. Of course, this would require additional research that is not included in the scope of this paper.

Table 5. Coefficients of partial correlation of goals of change and cognitive elements of attitude

Statements related to the cognitive component of attitudes	Statements related to the objectives of organizational changes			
	1	2	3	4
1	0.6147	0.5914	0.8240	0.7405
2	0.8095	0.7322	0.6394	0.6228
3	0.7318	0.4176	0.5507	0.5810
4	0.4062	0.3826	0.6201	0.8317

Significance 0.05
Source: author's research

The statements' affective and cognitive average values are located in the area of disagreement of the respondents, which could be interpreted as the influence

of the cognitive component of the attitude. According to Chadock's scale, more than half of the observed and perceived statements about the goals of organizational changes and statements about their knowledge indicate a medium-strong and strong mutual connection (r = 0.5507-0.8317). The partial correlation coefficients of the statements that define and mark all three components of employees' attitudes (cognitive, affective, and conative) towards the organizational changes that the respondents perceived as the most pronounced and, thus, the most impressive are shown in Table 6.

Table 6. Partial correlation coefficients of the components of employees' attitudes

	1	2	3	4	5	6	7	8	9	10	11	12
1	0											
2	0.46	0										
3	0.53	0.37	0									
4	0.58	0.49	0.38	0								
5	0.62	0.73	0.69	0.54	0							
6	0.71	0.56	0.77	0.81	0.38	0						
7	0.53	0.73	0.66	0.57	0.42	0.36	0					
8	0.58	0.64	0.85	0.76	0.44	0.40	0.52	0				
9	0.40	0.63	0.62	0.59	0.62	0.59	0.73	0.58	0			
10	0.56	0.44	0.48	0.55	0.81	0.75	0.63	0.68	0.36	0		
11	0.37	0.51	0.41	0.47	0.56	0.71	0.66	0.77	0.48	0.51	0	
12	0.58	0.58	0.65	0.39	0.60	0.56	0.52	0.64	0.63	0.49	0.58	0

Significance 0.05
Source: author's research

There is a strong correlation between the cognitive and affective (r = 0.53 - 085) and affective and conative (r = 0.56 - 0.81) components of the employees' attitudes. The affective component with registered negative emotions (a = 2.759) thus gives a key feature to the negatively connoted attitudes of employees (a = 2.860) towards organizational changes.

6. DISCUSSION

The respondents did not identify with the goals of organizational changes because they disagreed with them. This can result from the correlation of the average values of cognitive statements in the zone of only partial agreement with the same. Thus the acquired knowledge of what these changes mean and

bring to them. It is also necessary to leave open the possibility that the resistance to these changes arose not from acquired cognitive abilities but from the fact that these changes were not in the respondents' interests. Of course, this would require additional research that is not included in the scope of this paper. The statements' affective and cognitive average values are located in the area of disagreement of the respondents, which could be interpreted as the influence of the cognitive component of the attitude. Negative emotions are also confirmed here as a source of employee resistance and a valuable signal for change managers to understand conflicting cognitive information, as warned by Kanske and Kotz. As a result of all three of its components, employees' attitudes towards organizational changes are negative, and this knowledge alone indicates possible forms of employee behavior towards organizational changes, such as resistance, passive or indifferent attitude.

The existence of a medium and mutual solid connection between the goals of organizational changes and knowledge about them is undoubtedly valuable knowledge. What gives an open space for discussion is the question: what other organizational factors besides the goals of the changes participate in the formation of the cognitive component of employees' attitudes toward organizational changes?

The strong interdependence between the cognitive and affective, as well as the affective and conative components of attitudes, points to an equally vital role that the affective component plays in determining employees' attitudes towards organizational changes. Negative emotions of employees towards changes reflect the negatively perceived goals of those changes, but possibly also some other factors that form the structure of the cognitive component (earlier experiences with changes, beliefs and expectations, life goals and interests of employees, etc.). These negative emotions are transferred to the conative dimension of attitudes, formed by the driving intention of attitudes in the form of employees' resistance, passivity, indifference, and destructive behavior as stakeholders of these changes.

7. CONCLUSION

When defining the goals of organizational changes, managers should not consider and anticipate only the business effects expected from the implementation of these changes. They must also include how the employees, as stake-

holders of these changes, will understand, understand and accept these goals and what emotional flows they will produce. This paper tried to make a specific contribution in that direction.

The medium-strong and solid connection between the perceived goals of organizational changes and knowledge about them indicates that these goals significantly form the cognitive component of employees' attitudes towards these changes, which confirms the first hypothesis in this research. The respondents did not identify with the goals of organizational changes, which resulted in all three components of attitudes having low average values. Hence, the attitudes towards these changes were also negative. As such, they were not generators of support but of resistance to change, which confirms the third hypothesis and research objective. The second hypothesis was also confirmed since knowledge about changes with a negative connotation was reflected in the emergence of negative emotions among employees.

The paper approaches employees' attitudes towards organizational changes, focusing on the perception of the goals of the changes, proving that they are one of the factors in the emergence of the cognitive, then emotional, and, finally, conative components of those attitudes. All of this points to the necessity for employees' attitudes to become an indispensable segment in the management of human resources, which should be approached in an interdisciplinary, continuous, and designed manner.

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THE INFLUENCE OF SOCIAL NETWORKS ON YOUTH BEFORE AND DURING THE COVID-19 PANDEMIC

Anita KULAŠ MIROSAVLJEVIĆ, Ph.D.
University of Slavonski Brod

E-mail: akmirosavljevic@unisb.hr

Abstract

Today, people live in a world where life without the use of media (newspapers, magazines, radio, television, Internet, social networks, etc.) is unimaginable. The media have significantly changed everyday life, and of all the media, social networks are the most responsible for this. Mentioning the influence of social networks mainly looks at the influence of social networks on youth. They grew up in an age when modern technology (media, social networks) was advancing. Almost everyone uses at least one of the social networks. The COVID-19 pandemic significantly contributed to the use of social networks. Due to the impossibility of live contact, the population was forced to establish virtual communication with friends, relatives, and work colleagues. This paper aims to investigate how social networks affect youth's daily life. The methodology in this paper uses descriptive statistics that will provide information about variables in a given dataset and highlight relationships between variables in a sample. The scope of the paper is to research how social networks served youth and what impact they had on them in the era of the COVID-19 pandemic. The survey indicates that many youth use and spend much time on social networks. Most respondents are neutral regarding the impact of social networks on themselves, but they agree that they negatively impact the mental health of children and youth. Respondents believe that the use of social networks increased during the pandemic. They agree that social networks are a powerful tool for informing the population about current topics related to the pandemic.

Keywords: media, social network, COVID-19 pandemic, youth, addiction

JEL Classification: D83, J13

1. INTRODUCTION

Today, life without using the media is almost unimaginable. The media surrounds us from morning to night, whether via radio, television, or the Internet. The media significantly influences science, culture, politics, the economy, etc. The media aim to deliver information to as many people as possible in the shortest possible time. In this way, they help people make daily decisions (weather forecasts, road conditions, etc.). In addition, they make it easier to communicate with people far away. Media has dramatically changed everyday life.

Social networks are primarily responsible for this. Social networks have an impact on everyone who uses them. The influence of social networks on youth is mainly considered. Youth are the ones who grew up in the age of modern technology (media, social networks).

The COVID-19 virus pandemic has also significantly contributed to the use of social networks. Due to the impossibility of live contact, the population was forced to establish virtual communication with friends, relatives, and work colleagues.

This work aims to show how social networks affect the everyday life of young people, how social networks have served and what impact they had during the pandemic of the COVID-19 virus.

The work consists of 9 chapters. The introduction contains initial information about the work, i.e., the reasons for choosing this topic. The literature review substantiates the chosen topic with the theoretical claims of various authors and talks about media and social networks in general. The following two chapters discuss the impact of social networks on young people before and during the COVID-19 pandemic. The fifth, sixth and seventh chapters concern the conducted research. The Conclusion contains confirmation of the importance of the chosen topic. At the end, there is a list of literature.

2. LITERATURE REVIEW

Various authors have investigated the importance of media and social networks in an individual's daily life. They realized that the media is not only for people to communicate but also to make it easier for people to make future decisions. As Mesarić said: "… computers and communication systems have not only

a functional role but also possess great dynamic and creative power: users of information technology have the opportunity and incentive to develop it further, thus becoming innovators themselves (Mesarić, 2005)." (Nakić et al., 2019).

Since the paper's topic is related to youth, it is important to specify who the youth are. According to UNESCO, young people are between 15 and 24 years of age. (UNESCO) "Youth is best understood as a transition period from childhood dependence to adulthood's independence. That is why, as a category, youth is more fluid than other fixed age groups. Yet, age is the easiest way to define this group, particularly concerning education and employment, because 'youth' is often referred to a person between the ages of leaving compulsory education and finding their first job.". (United Nations Youth, 2013) "The following age model is adopted from USAID's Youth Policy (2012): Early adolescence (10-14 years) is a transition from childhood and involves the onset of puberty. Adolescence (15-19 years) is often critical for finalizing education and entering the labor market. Emerging adulthood (20-24 years) is when youth typically establish themselves independently from their parents, which makes livelihood and self-reliance increasingly important. The transition into adulthood (25-29 years) is characterized by forming families and raising children. In adulthood (30+ years), increased civic engagement and extended access to land, property and income opportunities are important parameters. Consequently, "youth is a life stage that is not finite or linear." (Ministry of Foreign Affairs of Denmark)

2.1. General Of the Media

The media are public information systems for the population. They disseminate certain news and essential information for education and information and even entertainment. The media aim to deliver information to as many people as possible in the shortest possible time. This is precisely why each medium has specific abilities and characteristics to differentiate it from the others. The media includes newspapers, publications, television programs, radio programs, Teletext, the Internet, and social networks. There are several types of media, and they can be divided into two groups: media according to how they transmit information and media according to the type of information they transmit.

According to the method of transmitting information, the media are divided into newspapers, radio, television and the Internet. Newspapers represent one of the most accessible and most used media. They mainly bring serious infor-

mation such as the state of the country, criminal acts, politics and the like. Radio makes it possible to get information at any time, no matter where you are. Television provides information on what interests a particular person, from politics, sports, education, and culture to entertaining topics such as information about famous people. The Internet contains much information that is very detailed and available anytime and anywhere. It is one of the primary means of informing the population. "The invention and development of the Internet accelerated the spread of the new organizational model of the information age - the network. Information and telecommunication networks powered by the Internet encompass all areas of the economy and society, manifesting their superior efficiency and unattainable advantage over previous centralized and hierarchical models of organization typical of the industrial era. The Internet is a unique communication medium that enables instant communication among millions of individuals spread across the planet." (Nakić et al., 2019).

According to the type of information they transmit, media are divided into daily information (information from the previous day), various cultural news (concerts, publication of new works, etc.), political information, sports news, news about famous people and other news such as weather prognosis.

"Technology has changed our ideas about media, especially the concept of mass media. There are three key changes: (1) the public has become fragmented, so they choose a smaller and smaller media niche for their own unique needs instead of being part of an undifferentiated mass, (2) the public is more active, so they choose two-way media that allow interactivity instead of the one-way media that allowed we passively receive information and (3) "journalist" today is anyone with a camera in a mobile phone and access to the Internet, as opposed to a trained professional who reports on the news."(Broom, 2010: 235). Today, the media have a considerable influence on the entire population. They are constantly available to the population and enable the creation of different beliefs and opinions about specific events about which the population would not have any information without the media.

"The media is the most powerful thing on earth. They are powerful enough to make the innocent guilty and the guilty innocent. That is the power of mass mind control." (Malcolm X) Žlof et al. (2014: 17) also write: "The cultural context, technological possibilities and the logic of media content production determine each type, form and way of presentation of media content."

2.2. General of the Social Networks

Social networks are one type of digital media that is very used and popular nowadays, especially among children and youth. These platforms on the Internet enable people to communicate with each other. Some are Facebook, Instagram, Twitter, Whatsapp, Tik Tok, and YouTube. "Social networks connect different forms of communication resources. Social networks have become a mainstream method of communication because they enable the rapid exchange of information about oneself, share photos and videos, write and use blogs and private messages to communicate with friends, people with whom they share common interests, and sometimes with everyone in the world who uses social networks." (Nakić et al., 2019). "Defined as places of meeting, creation and communication, with adaptable communication techniques and the increasing availability of the Internet, social networks such as Facebook, Twitter and others have significantly changed the way of communication between organizations, communities and individuals by turning communication into an interactive dialogue." (Kovačić et al., 2019).

"Young people's lives today are no longer imaginable without social networks such as Facebook and Google +. On a date in a cafe, a guy and a girl sit opposite each other, but they no longer look into each other's eyes, but each stares at their smartphone and maybe tweets to their friends that they are having a great time on the date."(Spitzer, 2018: 104) "In his public speeches, Shirky (2008) often points out that we are participants in the fifth communication of the revolution. He believes that it was this fifth communication revolution that made it possible for the Internet to turn its users into a society, a group, and a community, achieving this same time utilizing two-way communication (many to many), achieving more than in any revolution before (Petrić, 2008)."(Nakić et al., 2019). "Croatian high school students who organized a protest against the poor implementation of the state graduation in April 2008 did not physically arrange the action. They organized the protest through emails, chats and Facebook." (Krajina & Perišin, 2009: 939).

Facebook is one of the most popular social networks today. It appeared in 2004 when Harvard student Mark Zuckerberg created it for students to communicate with each other. After that, other universities, educational institutions, and companies join Facebook. The population uses Facebook for various purposes: communication, entertainment, work, etc. The unique feature

of Facebook is undoubtedly privacy control. Users can choose who they will relate to. They can hide their private information from unknown people. They can choose users who will be their friends. The disadvantages are fake profiles, various scams, and misuse of private information. In addition to Facebook, the population often uses Instagram as well. Instagram is a social network that appeared in October 2010 and was designed by Kevin Systrom and Mike Krieger. In the beginning, Instagram was for sharing photos and videos. Today, it also can send messages, establish audio and video calls, and the "Story" feature is available to followers 24 hours a day. On Instagram, users can share posts publicly or with a predetermined number of followers. Choosing whether the profile will be public or private is also possible. Different companies also use Instagram as a potent tool for image creation and promotion of new and existing products. As with any social network, certain private information is available through Instagram, which can be misused and used to create fake profiles.

"Žlof, Herljević and Hadžić emphasize the speed of information dissemination, the possibility of free promotion of products and own texts, and the exchange of opinions, attitudes and values with others and the reader's feedback as positive aspects of social networks. As opposing, worrisome sides, they highlight the transmission of news from unverified sources, manipulation and publication of content that has nothing to do with journalism."(Kovačić et al., 2019)

3. THE INFLUENCE OF SOCIAL NETWORKS ON YOUTH

Nowadays, communication is more and more reduced to typing via social networks. People go out and socialize less and less. Even when they go out for coffee, their mobile phone is always with them, and they are always available via social networks. Today, Facebook, Messenger, Instagram and Whatsapp are the most used among the population. Social networks mainly affect youth because they grew up when modern technology advanced. There is almost no young person who does not use at least one social network. One of the most dangerous things about social media is that even elementary school kids are joining social media. Fewer and fewer children are playing on playgrounds, rollerblading or cycling, walking with friends and the like. Socializing is mostly about playing games and watching videos and content shared on social networks. The most common consequences of using social networks are insomnia, depression and

addiction. (Zubair et al., 2023) Youths spend time on the Internet until late hours. Many people think it does not matter if someone stays up all night, but it dramatically affects the human body. This avoidance of sleep leads to chronic fatigue, which leads to obesity and diabetes. Spending time on social networks, young people often neglect their physical activity. Youth hardly ever go out for a walk, bike ride, etc. They play sports less and less and give up all activities. This is precisely why obesity among young people has been increasing in recent years. (Spitzer, 2018) Spending time on mobile phones, at the computer or in front of the television, young people become listless and depressed, which significantly affects their school and education, obligations and leisure activities. Looking at youth, hardly anyone looks happy. Many topics about appearance and beauty on social networks significantly affect youth because their imperfections make them unhappy. (Zubair at al., 2023) Youths are charged with complexes because of fatness, facial pimples, hair color, etc. They try to cover their flaws with different filters when they should accept them and be satisfied just as they are. This is something that makes them unique. On social networks, they often encounter various forms of bullying, insults, gossip and ugly rumors, which leads to even more violence. Youths fall into bad psychological states that often have bad consequences, such as depression or suicide attempts. "The results of research conducted in 2004 by the Zagreb Institute for Social Research on a sample of 2,000 respondents aged 15 to 29 show that youth perceive low living standards, lack of life perspective and unemployment as the biggest problems in Croatia, while lack of interest for social and political events, the insufficient participation of youth in social and political affairs and the mass departure of young professionals to other countries are at the bottom of the list of the most important problems of young people in Croatia (Ilišin, 2007)." (Nakić et al., 2019)

The most well-known influence of social networks on youth is addiction. "The use of digital media in kindergarten and elementary school - when the child's brain is especially susceptible to reshaping - encourages the attraction of youth to dangerous addiction." (Spitzer, 2018: 260) Mobile phones, laptops and computers are starting to be used by younger generations, and their use also results in the use of social networks. Although specific social networks do not allow users under 13 to register, most lie about their age. Typing has replaced face-to-face conversations. Youth are available 24 hours daily and pick up their mobile phones at every notification sound. Most of them cannot stand not being active on any of the social networks for a day. "The use of Facebook serves to

maintain existing social ties, and when it comes to creating new contacts, then they are mostly realized based on similarities (sociocultural and worldview) with others, states Krolo (2015: 150). However, individual studies (cf. Wellman et al., 2001: 436-455; Corrigalt-Brown & Wilkes, 2014 according to Pavić & Šundalić, 2015: 129-130) confirm that the Internet viewed in general as a medium can influence the reduction of social capital in the context of the lack of feedback, then the reduction of time for interaction in the real world, which can ultimately result in the alienation of the individual from reality. The above often happens to children and minors who often practice risky behaviors in online communication due to ignorance, without thinking about the consequences of such actions. Therefore, in addition to education, they must be provided with an appropriate legal framework to protect them further." (Grmuša et al., 2019: 83)

4. SOCIAL NETWORKS DURING THE COVID-19 PANDEMIC

With the appearance of the COVID-19 virus at the end of 2019, significant changes swept the world. The virus spread rapidly and had a high mortality rate, and the authorities restricted the movement of people. This led to social distance and isolation between people. This is precisely why social networks have started to be used even more so that people can establish virtual contact with their loved ones. Social networks have served as a powerful tool for everyone during the pandemic. On them, users could find out the latest information related to COVID-19 and stay current. There were live broadcasts of the National Headquarters for Civil Protection on social networks, officials published the latest information, and various internet portals transmitted the information they received from various health institutions and health professionals.

The benefits of social networks during the pandemic were multiple. Social networks made it possible to communicate with business partners, friends, acquaintances or family wherever they were. Various companies and stores created their image through social networks in the hope that it would be recognizable worldwide. As a positive side of social networks during the pandemic, we can mention online teaching, made possible for teachers and students through different social networks in audio and video formats and for different companies that could do their work online from their homes. On the other hand, social networks also had negative effects during the pandemic. Due to insecurity and

fear of a new unknown virus, various misinformation and conspiracy theories began to spread. Conspiracy theories were mainly spread because of the vaccine, which is a big unknown to everyone. (Bacon & Taylor, 2022; Wonodi at al., 2022) The amount of misinformation and conspiracy theories has affected the decline of people's trust in social networks, while the level of trust in traditional media has increased. "During the coronavirus pandemic, the number of harmful and misleading misinformation and conspiracy theories that spread mainly on the Internet increased. Uncertainty and fear due to the pandemic, the situation's complexity, epidemiological measures, the solution in the form of a vaccine and more have fuelled the emergence of conspiracy theories. A survey conducted in 28 countries showed that more than 30% of people surveyed believe in conspiracy theories related to the origin and purpose of the COVID-19 disease pandemic (Gallup International, 2020). Studies have also determined that exposure to misinformation and conspiracy theories that spread through the media and social networks is one of the key factors of distrust in vaccines and vaccination (Badur et al., 2020; Piedrahita Valdés et al., 2021), while exposure to negative sentiments about vaccination on social media can increase hesitancy and vaccine refusal (Mamidi et al., 2019; Salathé et al., 2013; Tasnim et al., 2020)." (Feldvari et al., 2022: 87)

Social networks had a more significant influence on children and youth during the pandemic than usual. The use of social networks has increased due to measures of social distance and isolation, but also due to the introduction of online classes. Precisely because of the increased use of social networks, the consequences that social networks bring with them have become increasingly frequent. Youth have become more depressed, and all the information, misinformation and conspiracy theories have affected their mental health, the formation of different opinions, and also the fear of the pandemic in general. (Ceccon & Moscardino, 2022) Even before the pandemic, youth reduced their physical activities due to social networks. Unfortunately, the pandemic only contributed to this. Various epidemiological measures prevented children and youth from engaging in their daily activities, which made them even lazier, and on the other hand, increased their use of various social networks as a source of entertainment and relaxation. This has led to an additional increase in obesity, associated with many other health problems, such as diabetes. On the other hand, there is also online teaching, because of which children and youth are forced to spend time on laptops, computers and mobile phones.

5. METHODOLOGY

The research included 100 respondents (65% of women and 35% of men). The smaller sample size is because the survey was conducted within a limited time frame. Observing the structure of the respondents, 65% of respondents are still students. The education structure is such that 60% of respondents have primary and/or secondary school education, and 40% have a high school education. The structure of respondents concerning age is such that 78% has less than 25 years old, and 22% are over 25 years old.

To identify how social networks served youth and their impact on them in the era of the COVID-19 pandemic, an anonymous questionnaire was conducted. The questionnaire was emailed via Google Forms or by sending the form directly, and the completed forms were collected the same way as they were submitted. The questionnaire consisted of four parts. In the first part, respondents were asked how reliable they consider the information they find on social networks and how much on other media (TV, radio, newspapers, Internet). In the second and third parts, respondents were asked which social networks they use most often and which media they use most often. In the end, respondents were asked nine questions about the impact of social networks on young people during the covid 19 pandemic. The author created the questionnaire himself, although there are similar studies by other authors.

In the part of the questionnaire, the respondents expressed their degree of agreement with each statement on the Likert scale with five assessment levels. Data were submitted and collected from February 23, 2022, to March 18, 2022.

Education level was used as the criterion variable. The entire sample of respondents, depending on the level of education, is divided into two groups: EL1 – primary and secondary education and EL2 - university degree. The reason for this distribution is to see if the respondents' opinions differ depending on the level of education. Dependent variables used to assess the influence of social networks on youth before and during the covid-19 pandemic consisted of four sets of variables. Data processing methods included calculating descriptive statistical parameters. The data were processed by the computer program Statistics ver.13.0.

6. RESEARCH RESULTS

Tables show the results of descriptive statistics for four sets of dependent variables used to assess the influence of social networks on youth before and during the covid-19 pandemic: mean, median, mode, minimum, maximum and standard deviations.

Distributions of results do not exceed the maxD value limit so that we can speak of normal data distribution. From the presented measures, it is justified to conclude that the variables have satisfactory metric characteristics. Therefore, parametric statistical procedures were applied in the processing of their results.

The first set of dependent variables assesses the reliability and accuracy of the information on social networks and other media depending on the education level of the respondents (Q1 – social media, Q2 – other media). The respondents agreed with each statement on the Likert scale with five assessment levels (1 = wholly unreliable and inaccurate, 5 = completely reliable and accurate). Below is Table 1. and Table 2. show this.

Table 1. Descriptive indicators for assessing reliability and accuracy of the information on social networks and other media of group EL1

Variable	EL1 (N=60)					
	Mean	Median	Mode	Min	Max	SD
Q1	2.900000	3.000000	3.000000	1.000000	5.000000	0.817188
Q2	3.416667	3.000000	3.000000	1.000000	5.000000	0.961843

Source: made by the author

Table 2. Descriptive indicators for assessing reliability and accuracy of the information on social networks and other media of group EL2

Variable	EL2 (N=40)					
	Mean	Median	Mode	Min	Max	SD
Q1	2.950000	3.000000	3.000000	1.000000	4.000000	0.638508
Q2	3.200000	3.000000	3.000000	1.000000	5.000000	1.042679

Source: made by the author

It can be seen in Table 1. and Table 2. that the average values of the results are similar regardless of the level of education.

The second set of dependent variables assesses the frequency of use of specific social networks depending on the education level of the respondents (Q3 – Facebook, Q4 – Instagram, Q5 – Whatsapp, Q6 – Viber, Q7 – TikTok, Q8 – Snapchat, Q9 – Twitter, Q10 – Youtube, Q11 – Pinterest, Q12 - Discord). The respondents agreed with each statement on the Likert scale with five assessment levels (1 = never, 5 = always). Below are Table 3. and Table 4. show this.

Table 3. Descriptive indicators for assessing the frequency of use of specific social networks of group EL1

Variable	EL1 (N=60)					
	Mean	Median	Mode	Min	Max	SD
Q3	3.133333	3.000000	Multiple	1.000000	5.000000	1.213856
Q4	3.983333	4.000000	4.000000	1.000000	5.000000	0.982761
Q5	3.666667	4.000000	4.000000	1.000000	5.000000	1.068290
Q6	2.800000	3.000000	2.000000	1.000000	5.000000	1.218501
Q7	2.550000	2.500000	1.000000	1.000000	5.000000	1.489227
Q8	2.216667	2.000000	1.000000	1.000000	5.000000	1.341536
Q9	1.633333	1.000000	1.000000	1.000000	5.000000	1.119423
Q10	3.833333	4.000000	4.000000	1.000000	5.000000	1.027860
Q11	2.133333	2.000000	1.000000	1.000000	5.000000	1.268479
Q12	1.983333	1.000000	1.000000	1.000000	5.000000	1.346580

Source: made by the author

Table 4. Descriptive indicators for assessing the use of certain social networks of group EL2

Variable	EL2 (N=40)					
	Mean	Median	Mode	Min	Max	SD
Q3	3.525000	4.000000	4.000000	1.000000	5.000000	1.154423
Q4	3.925000	4.000000	5.000000	1.000000	5.000000	1.308503
Q5	4.225000	4.500000	5.000000	1.000000	5.000000	1.025008
Q6	2.650000	3.000000	3.000000	1.000000	5.000000	1.271986
Q7	2.125000	1.000000	1.000000	1.000000	5.000000	1.453334
Q8	1.825000	1.000000	1.000000	1.000000	5.000000	1.195880
Q9	1.200000	1.000000	1.000000	1.000000	4.000000	0.607644
Q10	4.100000	4.000000	4.000000	2.000000	5.000000	0.900142
Q11	1.950000	2.000000	1.000000	1.000000	5.000000	1.084861
Q12	1.250000	1.000000	1.000000	1.000000	5.000000	0.776250

Source: made by the author

It can be seen in Table 3. and Table 4. that the average value of standard deviations is relatively uniform except in assessing the frequency of use of Instagram (Q4), Twitter (Q9), Pinterest (Q11) and Discord (Q12). However, it is noticeable that the group of respondents with primary and secondary education (EL1) is, on average, the most heterogeneous in their answers in assessing the frequency of use TikTok (SD = 1.49), while the most homogeneous group of respondents is in the group of respondents with higher education (EL2) in their responses in assessing the frequency of use Twitter (SD = 0.61). It is also evident that all respondents use Facebook (Q3), Instagram (Q4), Whatsapp (Q5) and Youtube (Q10).

The third set of dependent variables assesses the frequency of use of other media depending on the education level of the respondents (Q13 – Internet, Q14 – radio, Q15 – television, Q16 – newspapers, magazines). The respondents agreed with each statement on the Likert scale with five assessment levels (1 = never, 5 = always). Below are Table 5. and Table 6. show this.

Table 5. Descriptive indicators for assessing the frequency of use of other media of group EL1

Variable	EL1 (N=60)					
	Mean	**Median**	**Mode**	**Min**	**Max**	**SD**
Q13	4.083333	4.000000	4.000000	1.000000	5.000000	0.869281
Q14	2.566667	3.000000	3.000000	1.000000	5.000000	1.140423
Q15	2.866667	3.000000	3.000000	1.000000	5.000000	1.065112
Q16	2.066667	2.000000	2.000000	1.000000	5.000000	0.954324

Source: made by the author

Table 6. Descriptive indicators for assessing the frequency of use of other media depending on the education of the respondents

Variable	EL2 (N=40)					
	Mean	**Median**	**Mode**	**Min**	**Max**	**SD**
Q13	4.600000	5.000000	5.000000	3.000000	5.000000	0.590523
Q14	2.900000	3.000000	3.000000	1.000000	5.000000	0.981887
Q15	3.450000	3.500000	4.000000	2.000000	5.000000	1.084861
Q16	2.300000	2.000000	3.000000	1.000000	4.000000	0.911465

Source: made by the author

However, it is noticeable that all respondents are, on average, the most heterogeneous in their answers in assessing the frequency of use of television (Q15) (SD = 1.06; SD = 1.08) while the most homogeneous are in their responses in assessing the frequency of use of Internet (Q13) (SD = 0.87; SD = 0.59). All respondents use the Internet most often (Q13).

The fourth set of dependent variables assesses the influence of social networks and the media on youth during the pandemic, depending on the education level of the respondents. The respondents expressed their degree of agreement with each statement on the Likert scale with five assessment levels.

The dependent variables were:

Q17 – Did you use social networks more than usual during the pandemic (during quarantine and isolation)? (1 = never, 5 = always)

Q18 – How much do you trust the information published on social networks related to the pandemic? (1 = never, 5 = always)

Q19 – How often have you used the National Headquarters for Civil Protection's Live broadcasts on social media to inform about the pandemic? (1 = never, 5 = always)

Q20 – How often have you used links to newspaper articles on social media to get information about the pandemic? (1 = never, 5 = always)

Q21 – How often have you used announcements from official institutions and people on social networks to inform about the pandemic? (1 = never, 5 = always)

Q22 – How much do you agree that social networks have been a powerful tool in informing citizens about the pandemic? (1 = completely disagree, 5 = completely agree)

Q23 – How much do you agree that social networks are suitable for spreading misinformation and conspiracy theories about the pandemic? (1 = completely disagree, 5 = completely agree)

Q24 – How often have you come across the spread of some misinformation or conspiracy theories about the pandemic on social networks? (1 = never, 5 = always)

Q25 – How often have you avoided social media because of information related to the pandemic? (1 = never, 5 = always)

Below are Table 7 and Table 8 show this.

Table 7. Descriptive indicators for assessing the influence of social networks and the media on youth during the pandemic of group EL1

Variable	EL1 (N=60)					
	Mean	**Median**	**Mode**	**Min**	**Max**	**SD**
Q17	4.316667	4.000000	5.000000	3.000000	5.000000	0.724666
Q18	2.983333	3.000000	3.000000	1.000000	5.000000	0.911167
Q19	2.416667	2.000000	1.000000	1.000000	5.000000	1.211410
Q20	2.733333	3.000000	3.000000	1.000000	5.000000	1.006195
Q21	2.750000	3.000000	2.000000	1.000000	5.000000	1.114238
Q22	3.850000	4.000000	4.000000	1.000000	5.000000	1.005493
Q23	4.383333	5.000000	5.000000	2.000000	5.000000	0.922261
Q24	4.016667	4.000000	Multiple	1.000000	5.000000	0.982761
Q25	3.516667	3.000000	Multiple	1.000000	5.000000	1.228085

Source: made by the author

Table 8. Descriptive of social networks and the media on youth during indicators for assessing the influence of the pandemic on group EL2

Variable	EL2 (N=40)					
	Mean	**Median**	**Mode**	**Min**	**Max**	**SD**
Q17	4.300000	5.000000	5.000000	2.000000	5.000000	0.853349
Q18	2.350000	2.500000	3.000000	1.000000	4.000000	1.026570
Q19	2.425000	2.000000	1.000000	1.000000	5.000000	1.298668
Q20	2.900000	3.000000	3.000000	1.000000	5.000000	1.172331
Q21	2.900000	3.000000	3.000000	1.000000	5.000000	1.081310
Q22	3.875000	4.000000	Multiple	1.000000	5.000000	1.158857
Q23	4.600000	5.000000	5.000000	1.000000	5.000000	0.841244
Q24	4.200000	5.000000	5.000000	1.000000	5.000000	1.066987
Q25	3.625000	4.000000	4.000000	1.000000	5.000000	1.294713

Source: made by the author

It can be seen in Table 7 and Table 8 that the average values of the results are similar regardless of the level of education.

7. DISCUSSION

Statistical analysis was conducted based on one criterion variable, education level. The criterion variable divided the sample into two groups. The variable education level has a group of respondents with primary and secondary education (EL1) and a group with higher education (EL2). The responses from respondents in the survey only show the respondents' perception of the importance of the variables.

All respondents, regardless of their level of education, consider that information is more reliable and accurate on other media than on social networks.

For respondents with higher education, the most crucial thing is WhatsApp and YouTube, while Instagram is essential for all respondents. All respondents use Twitter and Discord the least.

All respondents use the Internet the most. At least, respondents use newspapers and magazines.

The analysis of the part related to the influence of social networks on young people before and during the pandemic showed the following:

* Youth used social networks more than usual during the pandemic (during quarantine and isolation),
* Youth rarely use the National Headquarters for Civil Protection's Live broadcasts, newspaper articles, and announcements from official institutions and people on social networks to inform about the pandemic, and
* youth largely agree that social networks are suitable for spreading misinformation and conspiracy theories about the pandemic. They often come across the spread of misinformation or conspiracy theories about the pandemic on social networks.

8. CONCLUSION

Today, media and social networks are our everyday life and something available to everyone, and that surrounds us. Many children and youth use social networks. A large amount of information is available through social networks, and it is possible to discover what an individual is interested in. Communication with friends and family located in other cities or countries is facilitated. As many advantages as social networks have, there are also many disadvantages.

The biggest drawback and problem related to social networks are the consequences that social networks have on the mental health of children and youth. Many youths have problems with insomnia, depression, and physical inactivity that lead to obesity, but the biggest problem is addiction. Today, it is unthinkable for youth to go somewhere without a mobile phone, not check what is happening on social networks, not respond to messages, etc. The pandemic also favored increased youth activity with the COVID-19 virus on social networks. Youth were then forced to use social networks to have at least virtual contact with friends and extended family. Classes also took place online, contributing to increased time spent at the computer, laptop, and mobile phone. Everyone should reduce the time they use social networks, especially children and youth. They should spend time with friends doing activities in nature, not typing messages while lying in bed.

Youth research was approached through a survey to prove everything theoretically stated in this paper. The influence of social networks on youth before and during the covid-19 pandemic was investigated. The obtained research results moderately confirm the theoretical statements of various authors, such as Bacon and Taylor (2022), Ceccon and Moscardino (2022), and others mentioned. Therefore, the aim of the paper set at the beginning of this research is that social networks influence youth before and during the covid-19 pandemic. This is achieved because the respondents mostly gave answers in the upper measurement scale. It is important to emphasize that the responses from respondents in the survey only show the respondents' perception of the importance of the variables.

The survey results show that most respondents use social networks, mainly Facebook, Instagram and Twitter. They use them mainly out of boredom and for fun and relaxation. The respondents agree that social networks have a bad effect on the mental health of children and youth, they also noticed a bad influence on them and their loved ones, but they continue to use them. Also, many respondents even thought about withdrawing from social networks. All respondents increased their use of social networks during the pandemic. They came across much information about the pandemic on social networks, but also misinformation and various conspiracy theories, which led them to avoid social networks.

The limitation of the present study was the available time for the completion of the questionnaire. As it was an online questionnaire, its access was restricted by time. The result was that some participants could not complete it within the specified time. Finally, sample size and representativeness are an issue to be addressed. Along with the study's limitations, we need to highlight the importance of conducting further research to obtain more valid results, such as a larger sample should be used. Also, it would be interesting to study how much the pandemic has increased the use of social networks in other age groups.

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ECONOMIC CONVERGENCE BETWEEN CENTRAL EASTERN AND WESTERN EUROPEAN UNION MEMBER STATES

Mirjana JELEČ RAGUŽ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Tourism and Rural Development in Požega

E-mail: mjelecraguz@ftrr.hr

Goran BAJT
Agronom d.o.o.

E-mail: gbajt@vup.hr

Abstract

The main objective of this paper is to examine the real economic convergence among the Central and Eastern (EU11) and Western (EU14) European Union member states in the last twenty-six years (1995 - 2021). The main problem of this research is the economic disparities in the standard of living and wealth between EU11 and EU14 member states and the absence of a consensus among economists on whether those disparities are decreasing. The additional problem is that most papers study convergence based on PPP-based GDP per capita, which is not an accurate measure of households' material well-being. A more accurate measure of households' material well-being, in addition to PPP-based GDP per capita, is PPP-based actual individual consumption (AIC) per capita, which is the added value of this paper besides the analysis of the impact of the COVID-19 pandemic. For this study, data from secondary sources of the World Bank international database were used, whereby the data were converted into a per capita measure divided by the midyear population. The paper used descriptive statistics (standard deviation and coefficient of variation) and regression method (linear regression model) for analysis. The results prove the existence of a convergence process among EU11 and EU14 member states in the last twenty-six years, according to both indicators (GDP and AIC), even during the pandemic. The only divergence

period was during the global financial crisis (2009 and 2010). The problem is that the convergence process is prolonged and should be encouraged by the growth-enhancing country's economic policy, which is the main implication of this paper. The research limitation is a short period of research and analysis based on two economic indicators. Including a broader range of indicators, such as labor productivity and the employment rate, is a proposal for further scientific research.

Keywords: economic convergence, economic indicators, European Union, Central Eastern EU member states (EU11), Western EU member states (EU14)

JEL Classification: D31, D63, F02, F15, F43, O11, O47

1. INTRODUCTION

The European Union (EU) is a supranational association of twenty-seven European countries. Member countries are usually divided into EU14, Western and old EU member states (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and Sweden) and EU13 as Central Eastern and new EU member states, countries that joined the EU in 2004 and after (Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, and Slovenia). EU13, except Cyprus and Malta, are countries of the former planned economy, less developed, and with a lower standard of living than the Western EU14 member states. EU11 countries are the subject of the research in this paper. By joining the EU, the less developed Central and Eastern EU member states (EU11) expected an incentive for development and other benefits arising from the common market, standard EU policies, and EU funds.

The main problem of this research is economic disparities in the standard of living and wealth between EU11 and EU14 member states. By reviewing the literature, it is impossible to unequivocally conclude that the differences in income and wealth between the EU11 and EU14 member states have decreased over time. The research results vary across different countries, different indicators, different methods, and different periods. A literature review indicates that it is not possible to conclude generally that the wealth gap is decreasing.

Therefore, this paper aims to research whether the economic disparities in material well-being between EU11 and EU14 have decreased over the last 26

years and how the global pandemic has influenced those processes. The paper research whether the expectations of growth and development of the EU11 from EU membership have been realized. PPP-based GDP *per capita* (in constant international $) and actual individual consumption (AIC) *per capita* were fundamental indicators for calculating economic convergence. Since the existing scientific and professional literature mainly uses *per capita* GDP in the calculation of economic convergence, the inclusion of *per capita* AIC as a more accurate measure of the material well-being enjoyed by households (The World Bank, 2023c), besides the impact of the pandemic, an added value of this paper.

With the help of the literature review, the main hypothesis is defined: the development gap between EU11 and EU14 countries, measured by PPP-based GDP *per capita* and PPP-based AIC *per capita*, decreased over time (1995-2021). Therefore, this research focuses on the material well-being of European households and the gap trends between the two EU blocks after 1995. The additional hypothesis assumes that the reduction of the development gap between EU11 and EU14 is impaired during the COVID-19 pandemic.

For testing the hypotheses, data from secondary sources of the World Bank international database were used, whereby the data were converted into a *per capita* measure divided by the midyear population since the PPP-based AIC indicator does not exist in a *per capita* form. The paper used descriptive statistics (standard deviation and coefficient of variation) and regression methods (linear regression model).

The paper is structured into four parts. In addition to the introductory part, the second part presents some theoretical frameworks and a brief scientific and professional literature overview. The third part presents the methodological framework of the research and its results. The last part is the conclusion, in which the main implications of the paper are discussed.

2. LITERATURE REVIEW

2.1. Short Theoretical Framework of Economic Convergence

In economic theory, the convergence phenomenon refers to decreasing disparities in the achieved level of economic development between less developed and developed countries according to the primary economic data, such as GDP

per capita. Convergence usually occurs if less developed countries have faster income growth and other macroeconomic indicators than developed countries, whereby the income of the less developed countries converges with the income of developed countries.

In the literature, there are usually two concepts for determining the convergence rate among countries: ß (beta) convergence and σ (sigma) convergence. According to ß convergence, less developed countries achieve higher economic growth rates than developed countries and thus attain their level. This implies a negative relationship between the initial level of GDP *per capita* and its long-term growth rate. Simultaneously, ß convergence refers to absolute and relative ß convergence. Absolute convergence implies that all countries have different initial income levels but strive towards the same income level. Therefore, less-developed countries grow faster than rich countries towards the same income level. Relative ß convergence implies that countries strive for different income levels due to different levels of technology, savings rates, and population growth rates (different steady-states). Therefore, ß convergence occurs when less developed countries demonstrate faster growth than developed countries but at different income levels. According to σ convergence, differences in the achieved living standards, measured by GDP *per capita* or other similar indicators, decrease over time. Those concepts are complementary and closely related.

2.2. Brief Literature Review

Income convergence and the influence of membership in the European Union is a question that has attracted the attention of numerous economic theorists. On the one hand, some authors claim that the EU's new and less developed countries have faster growth than old and developed member states. As the main argument, they cite the diminishing returns to (adding) factors of production, in particular capital, i.e., the diminishing marginal product of capital (Vella, 2015; Matkowski, Prochniak & Rapacki, 2016; Glodowska & Pera, 2019). Followers of the neoclassical theory belong to that group of economists, whose founder is Solow (1956). According to them, if we assume that there are no technological changes, capital equipment increases if the capital growth is faster than the growth of the labor force. Since each worker is better equipped with capital, their productivity and *per capita* production increase. Thus the living standard also increases. The returns on newly added capital

increase rapidly at first but cannot generate long-run growth as the return rate on later investments will be gradually lower (diminishing returns to capital). Diminishing returns to capital means that as the economy has more and more capital, an additional unit of capital generates less and less output. Two computers per worker are unnecessary since the second will not increase worker productivity like the first (Jeleč Raguž, 2020: 255). Therefore, the traditional neoclassical model predicts per capita income convergence, regardless of initial income levels. Another variant of the neoclassical model assumes that technology changes and advances (Sato, 1966). Technological change implies that more products and services can be produced with the same labor and capital inputs. Technological changes lead to further growth in productivity, production per worker, wages, and living standards. Throughout history, neoclassicists argued that the convergence process does not occur due to technological progress since growth based on increasing the capital equipment of labor necessarily leads to convergence (diminishing returns).

On the other hand, authors such as Romer (1986) and Lucas (1988) dispute the existence of diminishing returns and emphasize the increasing returns of production factors, mainly due to the experience of rich countries in developing capital-intensive technology. Thus, they advocate the existence of divergent rather than convergent processes. The representatives of the endogenous growth theory belong to them, who deny the assumptions of the neoclassical theory and advocate constant or growing returns on capital. In addition to exogenously provided technological progress (neoclassical growth theory), they advocate endogenous sources of technological progress such as human capital (accumulated through formal education, learning through work, etc.), research and development (R&D) that includes externalities and public goods, etc. Endogenous growth theories imply the possibility of continuous growth since the growth rate is determined endogenously through knowledge, education, research & development (R&D), innovation, technological progress, etc. Accordingly, they deny the diminishing returns on capital and the necessary economic convergence represented by the traditional neoclassical growth model.

In the empirical literature, there are also disagreements about the existence of the convergence process between developed and less developed EU countries. On the one hand, some empirical studies prove the convergence. For example, Vella (2015) proved that poor countries (EU13) grow faster than rich countries (EU15) in terms of *per capita* income and convergence in the period

2000–2012. Matkowski et al. (2016) confirmed the existence of a clear-cut income-level convergence of the EU11 countries toward the EU15 throughout the 1993-2015 period. Borić (2017) proved the existence of convergence among NUTS 2 EU regions in the 1995-2015 period using the coefficient of variation (σ convergence). Marelli et al. (2019) confirmed a convergence process in EU28 in the 1995–2016 period and a divergence process in the old EU15 countries, which indicated higher growth rates in poorer countries. According to Mascherini et al. (2021), GDP *per capita* shows an upward divergence from 2009 to 2019 after an initial decrease in disparities in both measures in 2009, while convergence was present according to ß convergence, at a rate of 1.8% per year in the 2008-2016 period (Mascherini et al., 2021: 17). Glodowska and Pera (2019) confirmed that Central and Eastern European (CEE) countries developed following the ß convergence regarding the EU15 countries. Rapacki and Prochniak (2019) displayed in their study a clear-cut income-level convergence of CEE countries toward the EU15 in the 1995-2015 period.

In addition to studies in which convergence is proven, there are also studies in which the convergence process is not proven. Alongside Mascherini et al. (2021), who proved the divergence process among EU countries after 2009, other studies also question the convergence process. Chocholatá (2018) proved ß convergence among NUTS 2 EU regions from 2004 to 2014. However, σ convergence was not proved for the whole analyzed period – the divergence process occurred in the pre-crisis period (2004–2008) and during the last three analyzed years, i.e., 2012–2014. Radosavljević et al. (2020) observed a clear and dynamic convergence of the EU benchmarks in 2000–2008. However, the economic crisis interrupted that process in 2009, discontinuing the convergence between Southeastern Europe (SEE) and the EU after 2010. Bićanić and Deskar-Škrbić (2019) claimed that data indicates the convergence process in the EU countries before the last two expansions of the EU (before the EU11 countries joined the EU). However, there is insufficient data on convergence following the last two expansions.

Considering that scientific and professional literature does not provide clear conclusions about the convergence/divergence processes, the results of the studies mainly depend on the methods used, sample countries, and the analyzed periods. The following hypothesis will be tested: the development gap between EU11 and EU14 countries, measured by PPP-based GDP *per capita* and PPP-based AIC *per capita*, statistically significantly decreased over time

(1995-2021). The impact of the coronavirus pandemic on the processes mentioned above will also be examined. That is also the added value of this paper, i.e., adding a new indicator (AIC) to the analysis and examining the impact of the pandemic. So, the question is if the development gap between EU11 and EU14, regardless of certain ups and downs, has, on average, decreased or not thorough the time (1995-2021).

3. ECONOMIC CONVERGENCE AMONG THE EU11 AND EU14 COUNTRIES

3.1. Research Methodology

The main objective of this paper is to examine the real economic convergence among the Central and Eastern (EU11) and Western (EU14) European Union member states in the last twenty-six years (1995 - 2021). The problem is the inequality of people's standard of living which mirrors the EU's economic inequality, and the question is whether those inequalities are decreasing over time. The existence of convergence/divergence processes between EU11 and EU14 will be examined by ß and σ convergence.

B convergence among the mentioned EU blocs would exist if countries with a lower initial GDP per capita achieved higher economic growth rates over time and reached the level of more developed countries. It is calculated using the regression method, which analyses the relationship between the growth of GDP *per capita* in the observed period and its initial value. B convergence would exist if this relationship were negative and statistically significant. Countries with a higher initial GDP *per capita* should have lower growth rates and vice versa. In this paper, as the added value, the PPP-based actual individual consumption (AIC) *per capita* was added as a better measure of material well-being.

Σ convergence between the mentioned blocs would exist if the differences in GDP *per capita* absolute values between the mentioned blocs decreased over time. Otherwise, if the difference grows over time, the process of divergence is in effect. Σ convergence can be measured by standard deviation and coefficient of variation. If the standard deviation decreases over time, the income differences among the countries decrease, which favors convergence. Suppose the coefficient of variation (standard deviation divided by the arithmetic mean, multiplied by 100) decreases over time. In that case, income differences among

the countries are decreasing, expressed as a percentage, while divergence means the opposite.

Regarding the literature review, the main hypothesis of the paper was formulated: the development gap between EU11 and EU14 countries, measured by PPP-based GDP *per capita* and PPP-based AIC *per capita*, decreased over time (1995-2021). Therefore, this research focuses on the gap between material well-being and the standard of living in the EU11 and EU14 and its trends in the 1995-2021 period. The research should indicate if it is possible to conclude that, generally, those differences decreased in the last 26 years. The additional hypothesis assumes that the reduction of the development gap between EU11 and EU14 is impaired during the COVID-19 pandemic.

This study used data from secondary sources of the World Bank international database. The literature review found that GDP *per capita* expressed in purchasing power parity (PPP) was mainly used as an indicator for calculating the convergence/divergence process. GDP *per capita* at PPP eliminates price differences among countries and indicates the real purchasing power of households. However, the main disadvantage of that indicator is the inclusion of specific components and transactions that are arguably less relevant when valuing a household's current material well-being. For example, the GDP measure assigns high values to income-rich economies, such as investment hubs or resource-based countries, where household consumption accounts for a relatively small share of total GDP (The World Bank, 2023c). This is typical because profits account for a much larger national income than wages and salaries.

That is the main reason why, in addition to GDP *per capita*, PPP-based actual individual consumption (AIC) *per capita* is used in this paper's analysis of the convergence. GDP *per capita* is an indicator that is not an accurate measure of households' material well-being. Generally, AIC more accurately measures the population's standard of living, and GDP measures the economy's strength. PPP-based actual individual consumption (AIC) *per capita* addresses these shortcomings and provides a more accurate measure of the material well-being enjoyed by households in economies worldwide. AIC is the sum of the individual consumption expenditures of households, nonprofit institutions serving households (NPISHs), and the government. It accounts for goods and services consumed by households, irrespective of whether they were purchased and paid for by households directly, by the government, or by nonprofit organizations

(The World Bank, 2023c). *Per capita,* measures use a mid-year population. As there is no data for AIC *per capita* at PPP, data for PPP-based AIC (Households and NPISHs Final consumption expenditure, PPP (constant 2017 international $)) was taken from the World Bank database and then divided by the midyear population (according to the World Bank data) to obtain a *per capita* measure. So, for each country and each year, the value of the PPP-based AIC (in the constant international dollar) is divided by the number of inhabitants in the middle of that year. That is the added value of this paper, besides the analysis of the impact of the pandemic on the convergence/divergence processes. AIC *per capita* is usually highly correlated with GDP *per capita* because AIC is, in practice, the most significant expenditure component of GDP.

The paper will analyze and test the existence of convergence using the mentioned two indicators, PPP-based GDP *per capita* and PPP-based AIC *per capita*, whereby the analysis according to the second indicator represents the added value of this paper. Descriptive statistics (standard deviation, coefficient of variation), and regression method (linear regression model) were used for analysis in this paper. For the calculation of the mentioned statistical measures, Microsoft Excel was used.

3.2. Research Results

3.2.1. ß convergence

The existence of ß convergence implies that less developed countries have faster economic growth rates than developed countries. Tables 1 and 2 present the GDP *per capita* at PPP in 1995 and 2021 and the average annual growth rate.

Table 1: Initial GDP *per capita* at PPP (constant 2017 international $) and average annual growth rate (1995-2021) in EU countries

Country	GDP *per capita* 1995	GDP *per capita* 2021	Average annual growth rate 1995-2021
Lithuania	10,640.4	39,305.6	10.36
Latvia	9,599.15	32,081.5	9.01
Ireland	32,615	102,496	8.24
Estonia	12,730.7	38,717.7	7.85
Poland	12,398.5	34,915.5	6.99
Romania	12,186.6	30,776.9	5.87
Slovak R.	13,219	31,866	5.43
Malta	19,766.2	44,658.7	4.84
Bulgaria	11,365.4	24,398.1	4.41
Croatia	15,073.6	31,635.8	4.23
Hungary	16,615.2	33,593.2	3.93
Slovenia	21,480.3	40,036.5	3.32
Czechia	22,758.6	40,741	3.04
Sweden	34,233.7	53,613.4	2.18
Finland	31,499.8	48,753.4	2.11
Cyprus	28,636.6	41,701.7	1.75
Luxembourg	80,379.1	115,683	1.69
Netherlands	39,498.1	56,617.4	1.67
Belgium	37,784.2	51,739.5	1.42
Germany	39,366.1	53,179.7	1.35
Denmark	43,015.7	57,962.7	1.34
Austria	40,425.4	54,121.2	1.3
Portugal	25,523.7	33,674.5	1.23
Spain	29,026	37,913.1	1.18
France	35,176.6	44,993.1	1.07
Greece	24,920.7	29,548	0.71
Italy	38,947.2	41,929.4	0.29

Source: Author's calculation based on The World Bank data (2022, 2023a).

Table 2: Initial average PPP-based GDP *per capita* (constant 2017 international $) and average annual growth rate (1995-2021) in EU11 and EU14

Countries blocks	Average GDP *per capita* at PPP 1995	Average annual growth rate 1995-2021
EU11	14,369.76	5.86
EU14	38,029.38	1.84

Source: Author's calculation based on the World Bank data (2022, 2023a).

Tables 1 and 2 indicate that new member states had generally higher annual average growth rates in the observed period than EU14.

B convergence will be calculated using the linear regression method based on the natural logarithm of the initial GDP *per capita* at PPP (constant international $) in the EU27 countries and their average annual growth rates. B convergence can be calculated based on panel data (annual GDP growth rates vs. GDP levels from the preceding year) and cross-sectional data (average annual GDP growth rates vs. GDP levels from the beginning of the period). In that model, the independent variable X is the log value of the initial GDP per capita at PPP. The dependent Y is the average real GDP growth rate (in the observed period).

According to Vojinović and Oplotnik (2008: 30-31), the formula for β regression based on cross-sectional data is:

$$\frac{1}{T} \log \frac{y_{i,t}}{y_{i,0}} = a + b * \log_{i,0} + \varepsilon_i \tag{1}$$

Where $\log y_{i,t}$ is a natural logarithm of GDP per capita at PPP in country i in year t, whereby 0 denotes the first year of the observed period, and t is the last one, i.e., T denotes the length of the observed period. *a* and *b* denote coefficients estimated from the linear regression model, and ε is an error term. Convergence occurs when $\alpha_1 < 0$, i.e. negative, indicating that higher initial income negatively affects the growth rate.

Table 3 presents the results of the regression analysis in the observed period. B convergence exists if *b* coefficient has a negative value and is statistically significant ($p < 0.05$).

Table 3: Regression results for β convergence in the 1995-2021 period (according to the PPP-based GDP *per capita*)

	a	b	R²	Significance F (P value)	Convergence
EU11	81.23	-7.87	0.79	<0.001	YES, significant
EU14	5.08	-0.30	0.00	0.883	YES, not significant
EU27	42.90	-3.90	0.55	<0.001	YES, significant

Source: Author's calculation based on the World Bank data (2022, 2023a).

The *b* coefficient is the most significant in the regression analysis. If it has a negative value, it indicates a convergence process among the experimental group of countries during the analyzed period. Besides the negative *b* coefficient, statistical significance is also required (p<0,05). A positive *b* coefficient implies a divergence process among the observed countries. The coefficient *a* is a constant element – a value of GDP growth when the initial GDP is 0. It does not have a specific meaning and is only a regression value. R-Square (R^2) indicates the model's reliability. The highest model reliability is in the example of convergence among the EU11 countries (79%). The results in Table 3 may indicate the current process of gap reduction according to the PPP-based GDP *per capita* (in constant international $). However, the hypothesis should be tested further by σ convergence. The reason is that β convergence indicates only convergence/divergence within the observed group of countries, and this paper aims to examine the convergence/divergence processes between two groups of countries, EU11 and EU14, for which σ convergence will be used. Results of β convergence indicate a gap reduction between EU27, but σ convergence indicates the intensity of that process.

3.2.2. Σ convergence

Σ convergence exists if, over time, there is a tendency to decrease an income gap between the observed group of countries, EU11 and EU14. The existence of σ convergence is calculated using the standard deviation (SD) and coefficient of variation (CV) based on PPP-based GDP *per capita* (in constant international $) and PPP-based AIC *per capita* in the 1995–2021 period. The comparison should reveal the dynamics of the convergence or divergence process.

Further analysis will examine the existence of convergence/divergence between the analysed EU country groups (EU11 and EU14). In Figure 1, the CV between the research groups is calculated based on the average GDP *per capita* at PPP (in constant international $).

Figure 1: Coefficient of variation of PPP-based GDP *per capita* (constant 2017 international $) between EU11 and EU14 (1995-2021)
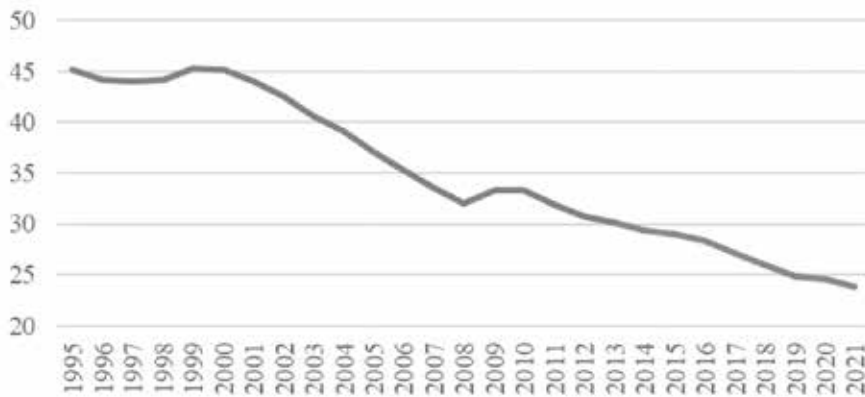
Source: Author's calculation based on the World Bank data (2023a).

Figure 1 shows that the convergence process based on *per capita* GDP between EU11 and EU14 can be noticed. The convergence started in the early 2000s and is almost continuous throughout the period, except for 2009 and 2010, i.e., during the global financial crisis. In 1995, the standard deviation was 45.15 percentage points of the arithmetic mean (average) of GDP *per capita* at PPP (CV=45.15), while in 2021, it was 23.83 percentage points. The deviations of GDP *per capita* from the average decreased by 21.32 percentage points over the 26 years. It is essential to point out that the convergence process was not disrupted by the COVID-19 pandemic in 2020 and afterward, according to the GDP *per capita*. According to the GDP *per capita*, the hypothesis is proven, i.e., the development gap between EU11 and EU14 countries, measured by PPP-based GDP *per capita*, has statistically significantly decreased over time (1995-2021).

However, although the convergence was proven, and there are some reasons for optimism, it has to be highlighted that the convergence process is very slow. The gap between the standard of living is still considerable. This does not give hope to the current EU11 residents since only their future generations will benefit from the EU membership.

Figure 2 presents the coefficient of variation (CV) based on PPP-based AIC *per capita*. AIC *per capita* presents better the well-being of households because it refers to their purchasing power, not the entire economy's strength.

Figure 2: Coefficient of variation of PPP-based actual individual consumption (AIC) *per capita* (constant 2017 international $) between EU11 and EU14
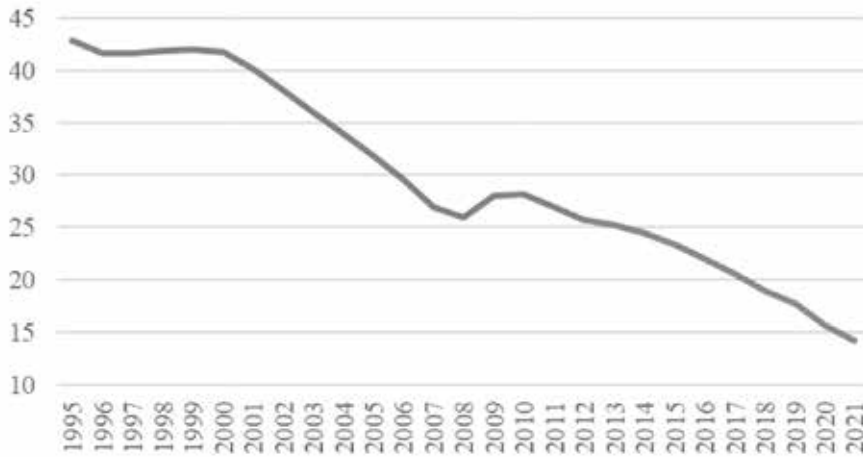
According to the coefficient of variation based on AIC *per capita* at PPP, the convergence process is also evident. It started in the early 2000s and has continued till recently, without any negative effects of the COVID-19 pandemic. This means that the pandemic did not negatively affect the convergence process. In 1995, the standard deviation value was 42.87 percentage points of the arithmetic mean (average) of AIC *per capita* at PPP (CV=42.87), while in 2021, it was 14.23 percentage points. The deviations of AIC *per capita* from the average decreased by 28.64 percentage points over the 26 years. The results are very similar to the result of the CV based on GDP *per capita* at PPP. Only the divergence process in 2009 and 2010 is more pronounced with AIC *per capita* than regarding the GDP *per capita* at PPP. Another significant result of the research indicates that the disparities according to the AIC *per capita* are less pronounced than regarding the GDP *per capita* at PPP since CV in 2021. based on AIC *per capita* was 14.2, and the GDP per capita was 23.83 percentage points, from which it follows that the gap according to the actual individual consumption (AIC) per capita is less pronounced than the GDP *per capita*. Also, the convergence process was more significant regarding the AIC *per capita* than GDP *per capita*. The research results have proved the central hypothesis, i.e., the development gap between EU11 and EU14 countries, measured by PPP-based GDP *per capita* and PPP-based AIC *per capita*, decreased over time

(1995-2021). However, the second (additional) hypothesis has not been proved since the COVID-19 pandemic did not affect the convergence process.

4. CONCLUSION

The topic of convergence is a prevalent topic among economists. However, according to both theoretical and empirical studies, it is evident that there is no consensus among economists on the existence of the convergence process between EU11 and EU14 member states. The literature review showed periods of convergence among different EU country groups and periods of divergence. It has been nineteen years since the significant enlargement of the EU. This paper examined what is going on with the economic disparities between EU11 and EU14 member states in the last 26 years. The EU11 member states expected positive effects on economic growth and development of their economies due to the accession to the single market, EU standard policies, EU funds, and similar positive effects.

The research subject was the convergence or divergence process among EU11 (mainly transitional), and EU14 member states from 1995-2021. The process of convergence or divergence was examined using the fundamental macroeconomic indicators such as PPP-based GDP *per capita* (PPP), GDP growth rate, and, as a better measure of the well-being of European households, PPP-based AIC *per capita*. Methods used in the paper are ß and σ convergence, i.e., regression model, standard deviation, and coefficient of variation.

The research results have proved the central hypothesis and indicate the presence of a convergence process between the EU11 and EU14 EU member states in the 1995-2021 period. The process of convergence was disrupted only during the period of the financial crisis in 2009. Moreover, in 2010, but not by the COVID-19 pandemic, which is an important implication of this research, proof that this paper's additional hypothesis has not been proved. Also, the gap between the living standards of EU11 and EU14 citizens is smaller according to the AIC *per capita* than according to the GDP *per capita*, which is also an essential feature of the research since AIC *per capita* is a more accurate measure of the material well-being enjoyed by the EU households.

Particularly important to emphasize is that the convergence process is very slow and needs further encouragement by economic policy. The deviations of

GDP *per capita* from the average decreased by 21.32%, and the deviation of AIC per capita from the average decreased by 28.64% over the 26 years. This does not give hope to the current EU11 residents since only their future generations will benefit from the EU membership. Some solutions are growth-enhancing structural reforms and raising productivity and employment, i.e., labor force participation rates. To raise the productivity level, it is necessary to encourage FDI (direct foreign investment) and domestic productive investments. Effective economic policies should also be emphasized because of the inclusion of an effective reduction of the tax burden and financial and political stability. Additionally, having an efficient and independent judiciary and combat crime and corruption is crucial.

The fundamental implication of this paper is to increase the awareness of the economic convergence between EU11 and EU14, which is in line with the expectations of the EU11 countries and advocates of neoclassical economic theory. However, that process is extremely slow, indicating a need for more significant growth-enhancing structural reforms by economic policyholders in EU11 countries. It turns out that the effect of market liberalization and free movement of goods, services, people, and capital, EU's regional and cohesion policy, EU funds, and so on, are not enough.

The research limitation is a short period of research (26 years) and analysis based on two economic indicators. Including a broader range of indicators, such as labor productivity and the employment rate, is a proposal for further scientific research.

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MANAGEMENT OF ORGANIZATIONS IN THE FIELD OF ARTS IN THE REPUBLIC OF CROATIA – STATE AND PERSPECTIVES FOR DEVELOPMENT

Majda ŠKRLEC, Ph.D.
Josip Juraj Strossmayer University of Osijek,
The Academy of Arts and Culture in Osijek

E-mail: milinovic.majda@gmail.com

Antoaneta RADOČAJ-JERKOVIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
The Academy of Arts and Culture in Osijek

E-mail: antoaneta.radocaj.jerkovic@gmail.com

Abstract

The sixties of the 20th century marked the beginning of a global need for management in culture and arts. According to standard definitions, management is a process of working with others and, with the help of others, to achieve organizational goals by using available resources. It is considered the key to the success and efficiency of organizations from various fields of work. The focus of this research is on the management of organizations in the field of arts, i.e., musical ensembles consisting of choirs, orchestras, chamber ensembles, large ensembles, etc., from the Republic of Croatia, operating at local, regional, national, and international levels. The sample of respondents consists of 184 professional and amateur music ensemble managers with an average of 16 years of experience managing ensembles. The role of management in the efficiency and success of organizations was highly valued, i.e., 90.7% of managers considered management extremely important.

Moreover, the results showed that internationally recognized and confirmed organizations have more competent management than other organizations,

especially considering that it indicates their activity, reputation, status, and recognition beyond national borders. In addition, the results showed that organization managers who have received recognition, been issued certificates, and been provided rewards on national and international levels recognize the importance of management for the efficiency and success of organizations to a greater extent than other managers. Regarding the current state, guidelines for potential improvement and prospective development of organizations in the arts field, i.e., music ensembles, have been developed.

Keywords: management of organizations in the field of arts, music ensemble management, art management, music ensemble development

JEL Classification: M1, M10, Z11, D22

1. INTRODUCTION

The environment in which art organizations operate is increasingly challenging and complex. For them to be as successful as possible in connecting and achieving their activities' artistic and organizational objectives and goals, since the second half of the 20th century, more and more attention has been focused on their management. Antolović (2009) states that the Arts Administration Research Institute was founded at Harvard Business School in 1966 and the Harvard Summer School Institute in Arts Administration four years later. At the same time, the first program for managers in culture is being established at the University of California in Los Angeles (UCLA). Let us consider the specific understanding of culture: historical traditions, morals and customs, language, literature and art. Cultural management is understood as a science and an art. It has its theories, principles, techniques, and methods as a science. On the other hand, as an art, it is related to the ability of the individual and the theoretical knowledge he possesses in order to be able to carry out management functions in practice and achieve the desired goals in the field of culture.

Since we are talking about a vital resource and one of the fundamental assumptions of the success of any organization, management in the field of culture and art represents a very current area of scientific research interest of numerous authors. Arts management can be defined as implementing traditional management functions to enable the art production and the presentation of works to the audience - harmonizing the administrative, creative process and its communication with the audience (Shafritz, 2018). According to Dragićević

Šešić and Stojković (2013), cultural management, art management or certain artistic activities are still not distinguished enough as a respected scientific discipline or skill that can sufficiently contribute to cultural and artistic practice. Therefore, this work, based on the study of management and its determinants in the operation of organizations in the field of art, is the result of the theoretical and practical need to merge these strongly and multiple related disciplines.

In order to point out the importance of management for the efficiency and success of organizations in the field of art, research was conducted which examined and determined the situation in the Republic of Croatia, and its focus was precisely the management of these organizations. The participants in this research were the managers of amateur and professional organizations - musical ensembles.

2. MANAGEMENT OF MUSIC ENSEMBLES

In the literature, the term management is most often interpreted as "the process of working with others and with the help of others to achieve organizational goals in a changing environment with effective and efficient use of limited resources" (Buble, 2006 according to Buble, 2010: 1). Authors Sikavica et al. (2008) present a similar definition and explain management as a process in which the activities of other people are being coordinated and by which the organization's goals are achieved with the use of all available resources. According to the Croatian Encyclopedia (2021), management occurs at all levels of society, from the state and government to individual organizations, in all types of organizations (private, public, profit, non-profit) and at all organizational levels (lower, middle and the highest). Its essential determinant is the focus on achieving goals with the help of others, and it is carried out through the process of decision-making, influence, communication and coordination, with the most rational use of resources. Management can be said to be a universal human activity.

Regarding translating the word management into Croatian, Sikavica et al. (2008) state that according to etymology, the translation would best correspond to leadership. Namely, the verb manage comes from the Latin word manus (hand). In addition, regarding the content implied by the term management and management functions, it is evident that they coincide to the greatest extent precisely with leadership functions, so it can be concluded that management and leadership are synonymous. According to Sikavica et al. (1999), manage-

ment can be defined as the executive activity of leadership. It is interpolated between management and fulfillment. Leadership is determined by management, i.e., the management function holder also determines the holders of managerial activity in the company. Management determines leadership, as well as the decisions that managers will make.

2.1. Musical ensembles – organizational units

According to the online edition of the Croatian Encyclopedia (2021), the organization is interpreted as a systematic connection of elements into a functional unit - structure- the process by which such connection is accomplished. Suppose the study of the concept of organization is approached sociologically. In that case, it is defined as a social collective form created to achieve specific goals - common and personal goals of individuals. Daft (2016) also speaks about the importance of the organization as a social creation. Stating why organizations are essential for each of us and society, the author primarily points out that the organization is a means to achieve goals and how it gathers resources to achieve specific goals. The author also emphasizes the importance of adapting organizations to the rapidly changing environment and today's diversity challenges.

Furthermore, Pavičić et al. (2006) state that organizations are founded by socially engaged, enterprising individuals and/or groups of people to meet the needs of their environment and see in them an opportunity to achieve their business, social, political and other goals. Robbins and Judge (2010) define an organization as a consciously coordinated social unit that consists of two or more people and operates on a relatively continuous basis to achieve a common goal or set of goals. The organization is also a means for achieving goals in the definition of which the essential elements of size, mutual connection and common goal are essential (Kovač, 2004, 2005, according to Sikavica, 2011). This is precisely the case with organizations in the field of art, whose work economic, managerial and marketing principles are very applicable (Bužarovski, 2014). In today's time, they are also necessary.

Organizations in the field of art are organizational units that bring together people with the same or similar interests who achieve their personal and common goals. In this paper, the above refers to musical art, where numerous musical ensembles operate in different organizational forms. The Croatian Encyclopedia (2021) offers several meanings of the term ensemble. Regarding the topic of this

work, a definition will be presented according to which it is a group of reproductive artists, musicians, dancers or actors who perform a piece together. In music, an ensemble means a group that performs vocal, instrumental or vocal-instrumental music together. Regarding the music-stage types that may include or primarily include the art of movement, i.e., dance (ballet, opera, operetta, musical), as well as folklore ensembles that also most often include movement, we can also talk about music-dance ensembles that include vocal-instrumental-dance expression.

If we take, for example, a musical ensemble - which can be seen as an organizational unit because it gathers people who have the same or similar affinity and together want to achieve the goals of the organization - the work of such organizations includes the fundamental management functions related to planning, organizing, managing human resources, leading and controlling. In the context of choral management, Radočaj-Jerković (2018) talks about successful managers' qualities, knowledge and skills, which are also necessary in working with musical ensembles from the manager, the choir conductor. The organizational functions of planning and organizing include elements of choral management related to choral program planning, auditions, selection of singers, organization of work within choral rehearsals and organization of public performances. The author also talks about the functions of leading, motivating, controlling and managing human resources, which can be observed from the very prominent role of the conductor, who, with his/her ideas and actions, influences the shaping and fulfillment of the choir's program goals. His/her role is also essential in the singer's motivation to work to achieve just the working and cooperative atmosphere that will lead to the desired musical, educational and social results in the most effective way. "Leading a choir requires the conductor, in addition to possessing a high level of musical and professional competence, to have those qualities, knowledge and skills that are characteristic for successful managers - leaders in other activities such as education, politics, economy and the like" (Radočaj-Jerković, 2018: 405). Accordingly, Moradzadeh et al. (2015) state that musicians should acquire (essential) management and entrepreneurship skills during their education. Research has shown that teaching which focuses on managerial skills (e.g., instruction in leadership, communication, self-awareness) results in improved managerial performance, which suggests that it is necessary to teach students the managerial skills they need to solve problems successfully, be team players and improve interpersonal communication (Hunsaker, 2001 according to Buble, 2010).

The authors Gashi, Požega and Crnković (2017) state that a successful organization and a successful society are based on a reasonable assessment of the ability of individuals and organizations to perform their functions effectively and sustainably. Following the above, it can be concluded: that variable aspirations in the field of art require adaptation of those who deal with it. Therefore all the reasons mentioned so far about the importance of organization can and should be considered in the field of organizations dealing with art. Today, they need to be appropriately shaped, structured and organized so that, following current regulations and under the influence of internal and external factors, they can be as successful as possible in their work, achieve their goals and achieve the desired results. In this context, the management of the organization is essential.

3. RESEARCH METHODOLOGY

3.1. Research objectives and hypotheses

To indicate the importance of management for the efficiency and success of organizations in the field of art, research was conducted with the following objectives:

- To examine, determine and present the views of managers of organizations in the field of art about the management of their organization,
- Examine, determine and present the managers' views on the importance of management for the efficiency and success of the organization,
- Examine and determine the relationship between the characteristics of the organization and the management of the organization,
- Examine and determine the relationship of organizational characteristics with the importance of management for the efficiency and success of the organization.

Following the stated goals, three research hypotheses were set:

H1: Management and its fundamental determinants in the operation of organizations in the field of art (musical ensembles) are essential for the efficiency and success of the organization and the achievement of its goals.

H2: Organizations that are recognized and acknowledged at the international level have better management compared to other groups of organizations.

H3: Managers of organizations that have been granted recognitions, diplomas and awards at the national and international level recognize the importance of management for the efficiency and success of the organization to a greater extent than other managers.

3.2. Scientific methods used

The data needed for the analysis were collected through an anonymous online questionnaire created using the Google Forms service. The questionnaire was divided into three parts. The first consisted of questions that determined the socio-demographic characteristics of the respondents. The second part contained questions related to the characteristics of the organizations in which respondents perform managerial functions. The third part analyzed the views and perceptions of the managers on the issues that are the subject of the research. General scientific methods, analysis and synthesis, induction and deduction methods, abstraction and concretization methods, proof and refutation methods, generalization and specialization methods, description methods, classification methods and comparative methods were applied in the work. A statistical method was used in the analysis of the collected data. For this purpose, both descriptive and inferential statistics were applied. Descriptive statistics included data editing and grouping, their graphical and tabular presentation, and the calculation of mean values and measures of dispersion. Hypotheses were established and verified using the methods of inferential statistics.

With regard to the characteristics of the research variables, non-parametric statistical tests were used: chi-square test, Fisher's exact test, comparison of column proportions with and without Bonferroni correction, Wilcoxon test, Mann-Whitney test, Kruskal-Wallis test and Dunn's test with and without Bonferroni correction. The chi-square test was used to verify the hypotheses of a significant dependence between the two characteristics of the elements of the basic set expressed on the nominal scale. Fisher's exact test was applied in the analysis when the chi-square test assumptions were not met. In cases where hypotheses about the existence of a significant dependence between the observed characteristics were confirmed, and at least one of them had three or more modalities, the proportions of the columns were compared to determine which of the observed deviations were significant. The comparison of the proportions of the columns was performed with and without the Bonferroni cor-

rection, which reduces the probability of accepting the false hypothesis of the existence of a significantly higher or lower representation of the analyzed category in the population. Wilcoxon, Mann-Whitney, Kruskal-Wallis and Dunn tests were applied in the analysis with the purpose of testing hypotheses related to the research variables measured on an ordinal (rank) scale. The Wilcoxon test tested the hypothesis that the median response of managers of organizations in the field of art is greater than 3, which represents a central or neutral rating or view. The research used the Mann-Whitney and Kruskal-Wallis tests to test hypotheses about the existence of statistically significant differences in the managers' answers regarding their socio-demographic characteristics and the characteristics of the organizations in which they operate. The Mann-Whitney test was applied in cases where the grouping variable had two modalities, and the Kruskal-Wallis test was when there were three or more. The tables with the results of the Mann-Whitney and Kruskal-Wallis tests also contain the corresponding average ranks. In cases where the Kruskal-Wallis test indicated significant differences between at least two compared groups, Dunn's test was applied to determine which groups these were. Dunn's test results are presented with and without Bonferroni correction. When interpreting Dunn's test results, the Bonferroni correction reduces the probability of accepting a false hypothesis about the existence of significant differences. Statistical significance in the paper is set at the significance level of $p < 0.05$. Statistical processing of the collected data was performed using statistical packages: IBM SPSS Statistics Version 24 (IBM Corp., Armonk, NY, USA), Statistica 12 (StatSoft, Inc., Tulsa, OK, USA) and Minitab 19.2020.1 (Minitab, Inc, State College, PA, USA).

4. RESEARCH RESULTS

4.1. A SAMPLE OF RESPONDENTS

The sample included managers of professional and amateur organizations in art from all counties of the Republic of Croatia, including the City of Zagreb. Managers are considered to be conductors, artistic directors, artistic leaders and all other people who participate in the organization's management and are primarily engaged in artistic work.

A total of 184 respondents of both sexes took part in the research, which was conducted in 2021, most of whom stated that they had a formal musical

education (82.6%), while 11% stated that they had an informal musical education. The respondents had an average of 16.28 years of professional experience.

When it comes to the characteristics of the organization, the characteristics, in several modalities, related to the type of organization, the form of the organization, the type of ensemble or ensemble that operates within that organization, the age of the organization, the number of members, recognition/acknowledgment of the organization and granted recognitions/diplomas/awards.

The following questions were intended to examine the attitudes of respondents - managers of organizations in the field of art about the management of their organization and the importance of management for the efficiency and success of the organization. Respondents rated the two elements mentioned on a five-point Likert scale (1 = negative, 5 = excellent). Table 1 shows how the management in their organization was valued differently: only 26.6% of the respondents rated the management as excellent, while most respondents (35.3%) rated it as very good. It was evaluated as good by 25.5% of respondents and worst (1 and 2) by 12.5% .

The importance of management for the efficiency and success of the organization was evaluated with high marks. As many as 90.7% of managers rated the mentioned element as excellent and very good, which confirms the first hypothesis of the research (H1): Management and its fundamental determinants in the operation of organizations in the field of art (musical ensembles) are essential for the efficiency and success of the organization and the achievement of its goals.

Table 1. Respondents, according to evaluations of the management of the organization and the perception of its importance for efficiency and success

Graded element	Grade				
	1	2	3	4	5
Management of the organization	7	16	47	65	49
	3.8%	8.7%	25.5%	35.3%	26.6%
The importance of management for the efficiency and success of the organization	1	3	13	40	127
	0.5%	1.6%	7.1%	21.7%	69.0%

Table 2 contains descriptive statistics of evaluated elements related to the organization's management and the importance of management for the success and efficiency of the organization.

Table 2. Descriptive statistics of evaluations of the organization's management and its importance for efficiency and success

Graded element	Arithmetic mean	Median	Mode	Lower quartile	Upper quartile	Interquartile	Standard deviation
Management of the organization	3.72	4.00	4.00	3.00	5.00	2.00	1.07
The importance of management for the efficiency and success of the organization	4.57	5.00	5.00	4.00	5.00	1.00	0.74

Respondents rated the organization's management with an average rating of 3.72. The higher arithmetic mean was calculated based on their rating related to the importance of management for the efficiency and success of the organization (4.57) - the first hypothesis (H1) was confirmed, as stated in front of Table 2. The obtained result points to the fact that managers are aware of the situation in their organization and see room for improvement in management because they rated its importance for the efficiency and success of the organization as excellent.

If it is considered that good (3) represents the central grade, the Wilcoxon test was used to check whether it is possible to accept the hypothesis that the medial grade of the organization's management and the importance of management for the efficiency and success of the organization is greater than 3. That is, managers are satisfied with the management in their organization. With a grade higher than three, they evaluate the element related to management's importance for the organization's efficiency and success. The results of the Wilcoxon test are listed in Table 3.

Table 3. Results of testing the hypothesis that the median grade of the organization's management and its importance for efficiency and success is greater than 3 using the Wilcoxon test

Graded element	Wilcoxon test	
	W	p
Management of the organization	8030.500	0.000*
The importance of management for the efficiency and success of the organization	14532.50	.000*

* Statistically significant at the p < 0.05 level

According to the Wilcoxon test, we can accept the hypothesis that the median grade of the organization's management and the importance of management for the efficiency and success of the organization is greater than 3.

The Mann-Whitney test was used to analyze the significance of the differences in the evaluations of the organization's management and the importance of management for the efficiency and success of the organization with regard to the type of organization, the results of which are listed in Table 4.

Table 4. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for efficiency and success concerning the type of organization using the Mann-Whitney test

Graded element	Type of the organization (average rank)		Mann-Whitney test	
	Amateur	Professional	Z	p
Management of the organization	85.26	105.76	-2.601	0.009*
The importance of management for the efficiency and success of the organization	89.53	97.94	-1.258	0.208

* Statistically significant at the p < 0.05 level

According to the average ranks of both elements, managers of professional organizations graded them higher. The results of the Mann-Whitney test show a statistically significant difference in the gradings of the observed groups regarding the evaluated element "Management of the organization". Managers of professional organizations evaluated the management of their organizations with statistically significantly higher grades than managers of amateur organizations, which points to the need to improve the management of amateur organizations in the field of art operating in the Republic of Croatia.

The following Table 5 shows the results of the analysis of the significance of the differences in the evaluations of the organization's management and its importance for the efficiency and success of the organization concerning the form of the organization. The Kruskal-Wallis test was used in the analysis.

Table 5. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for efficiency and success concerning the form of the organization using the Kruskal-Wallis test

Graded element	Form of the organization (average rank)			Kruskal-Wallis test	
	Public institution or artistic organization	Association	Ensemble at an educational institution or religious community	H	p
Management of the organization	97.46	88.87	78.79	3.861	0.145
The importance of management for the efficiency and success of the organization	89.73	86.59	88.30	0.175	0.916

From the average ranks, it follows that the organization's management was evaluated with the highest marks by the managers of public institutions or artistic organizations and the lowest by the managers of ensembles at educational institutions or religious communities. The second element about the importance of management for the efficiency and success of the organization was also graded the highest by managers of public institutions or art organizations and the lowest by managers of associations. It can be said that the obtained result follows the previously obtained, according to which the management of the organization and its importance for the efficiency and success of the organization were evaluated with higher marks by the managers of professional ensembles - which, in the case of this kind of division are precisely public institutions or artistic organizations. However, the Kruskal-Wallis test did not indicate a statistically significant difference between the observed groups.

Table 6 shows the results of the significance of the differences in the evaluations of the organization's management and its importance for the efficiency and success of the organization concerning the type of ensemble using the Kruskal-Wallis test.

Table 6. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for efficiency and success concerning the type of ensemble using the Kruskal-Wallis test

Graded element	Type of the ensemble (average rank)				Kruskal-Wallis test	
	Choir	Orchestra	Chamber ensemble	Large ensemble	H	p
Management of the organization	84.18	104.84	91.21	101.06	4.952	0.175
The importance of management for the efficiency and success of the organization	91.88	95.66	81.66	104.52	5.234	0.155

The average ranks show that the orchestra managers rated the organization's management the highest, while the choir managers rated it the lowest in their organizations. The importance of management for the efficiency and success of the organization was evaluated with the highest ratings by the managers of large ensembles and the lowest by the managers of chamber ensembles. However, the Kruskal-Wallis test does not indicate a statistically significant difference between the groups concerning the type of ensemble and the evaluated elements.

The following is Table 7, which shows the results of the analysis of the significance of the differences in the evaluations of the organization's management and its importance for efficiency and success concerning the age of the organization (years of existence), also using the Kruskal-Wallis test.

Table 7. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for efficiency and success concerning the age of the organization (years of existence), using the Kruskal-Wallis test

Graded element	The age of the organization (average rank)			Kruskal-Wallis test	
	0 – 15	16 – 80	81 and above	H	p
Management of the organization	89.50	92.03	99.03	0.872	0.647
The importance of management for the efficiency and success of the organization	87.13	89.83	107.82	6.137	0.046*

* Statistically significant at the p < 0.05 level

The average ranks suggest that the managers of the oldest organizations (81 and older) evaluated their organization's management with the highest ratings and the managers of the youngest organizations (0-15 years of existence) with the lowest ratings. Regarding the importance of management for the efficiency

and success of the organization, managers of organizations aged 81 and overrated this element the highest, and organizations aged 0-15 years the lowest. The results of the Kruskal-Wallis test in the case of the element "The importance of management for the efficiency and success of the organization" confirmed that there are at least two groups of managers who differ significantly in their ratings, so Dunn's test will be applied in order to identify such groups in the analysis. The results are listed in Table 8.

Table 8. Analysis of the significance of the differences in the evaluations of the importance of management for the efficiency and success of the organization concerning the age of the organization using Dunn's test

Graded element	Dunn's test	The age of the organization (compared groups)		
		0 – 15	0 – 15	16 – 80
		16 – 80	81 and above	81 and above
The importance of management for the efficiency and success of the organization	Z	-0.377	-2.378	-2.087
	p	0.706	0.017*	0.037*
	p-corrected	1.000	0.052	0.111

* Statistically significant at the p < 0.05 level

Table 8 shows two *p-values*, the first representing the uncorrected empirical significance level, while the second is based on the Bonferroni approach. Suppose the uncorrected p-values for both assessed elements are taken into account. In that case, it can be observed that there is a statistically significant difference between the groups aged from 0 to 15 and 81 and above and from 16 to 80 and 81 and above in terms of the evaluation of the element of the importance of management for the efficiency and success of the organization. However, concerning the Bonferroni correction, it is evident that this difference is not statistically significant.

The Kruskal-Wallis test was further applied in the analysis in order to examine the significance of differences in the evaluations of the elements of the management of the organization and its importance for the efficiency and success concerning the number of members of the organization (16 and fewer, from 17 to 80 and 81 and more). The results are shown in Table 9.

Table 9. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for the efficiency and success concerning the number of members of the organization using the Kruskal-Wallis test

Graded element	The number of members (average rank)			Kruskal-Wallis test	
	16 and less	17 – 80	81 and more	H	p
Management of the organization	93.35	90.35	99.76	0.753	0.686
The importance of management for the efficiency and success of the organization	74.99	97.78	101.46	10.486	0.005*

* Statistically significant at the p < 0.05 level

According to the average ranks, it can be seen that the managers of the organizations with the most members (81 and more) gave the highest ratings to both elements. The results of the Kruskal-Wallis test confirmed that there are at least two groups of managers of organizations that differ significantly in their evaluations in the case of the evaluated element on the importance of management for the efficiency and success of the organization. In order to find out which groups we are talking about, Dunn's test was applied in the analysis (Table 10).

Table 10. Analysis of the significance of the differences in the evaluations of the importance of management for the efficiency and success of the organization concerning the number of members of the organization using Dunn's test

Graded element	Dunn's test	The number of members (compared groups)		
		16 and less	16 and less	17 – 80
		17 – 80	81 and more	81 and more
The importance of management for the efficiency and success of the organization	Z	-3.022	-2.533	-0.396
	p	0.003*	0.011*	0.692
	p-corrected	0.008*	0.034*	1.000

* Statistically significant at the p < 0.05 level

Both *p-values* point to the conclusion that regarding evaluating the importance of management for the efficiency and success of the organization, there are statistically significant differences between organizations with 16 and less and from 17 to 80 and 16 and less, as well as 81 and more members. In both

cases, managers of organizations with more members (from 16 to 80 and 81) evaluated the observed element with statistically significantly higher scores compared to managers of organizations with 16 and fewer members. It was therefore shown that managers of organizations with a more significant number of members (from 16 to 80 and 81 and more) statistically recognize the importance of management for the organization's efficiency and success significantly more than their colleagues with 16 and fewer members. The possible reason is precisely the number of members, the existence of a large number of organizational units (several smaller groups within one larger ensemble: singers, musicians, dance groups, etc.) and the complexity of work in large organizations in which a large number of other people's activities are coordinated to achieve organizational goals. These managers recognized that quality management is an essential resource and a possible foundation for the organization's success.

Table 11 shows the results of the analysis of the significance of the differences in the evaluations of the organization's management and its importance for efficiency and success concerning the recognition and acknowledgment of the organization using the Kruskal-Wallis test.

Table 11. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for the efficiency and success concerning the recognition and acknowledgment of the organization using the Kruskal-Wallis test

Graded element	Recognition and acknowledgment of the organization (average rank)				Kruskal-Wallis test	
	Local level	Local and regional level	Local, regional and national level	Local, regional, national and international level	H	p
Management of the organization	93.39	72.17	79.11	108.58	14.836	0.002*
The importance of management for the efficiency and success of the organization	85.09	83.43	87.42	103.24	7.434	0.059

* Statistically significant at the p < 0.05 level

It is evident from the average ranks that the management of the organization was evaluated with the highest marks by the managers of organizations that are internationally recognized and acknowledged, and the Kruskal-Wallis test

confirmed that there are at least two groups of managers who differ significantly in their ratings, which Dunn's test will verify.

The average rank in the case of ratings on the importance of management for the efficiency and success of the organization further showed that, once again, managers whose organizations are recognized and acknowledged at the international level valued the mentioned element with the highest ratings. However, the Kruskal-Wallis test does not indicate a statistically significant difference between the ratings of different groups, from which it can be concluded that all managers consider it (equally) important.

The following are the results of the analysis of the significance of the differences in the evaluations of the organization's management concerning the recognition and acknowledgment of the organization using Dunn's test (Table 12).

Table 12. Analysis of the significance of the differences in the evaluations of the management of the organization concerning the recognition and acknowledgment of the organization using Dunn's test

Graded element	Dunn's test	Recognition and acknowledgment of the organization (compared groups)					
		Local level / Local and regional level	Local level / Local, regional and national level	Local level / Local, regional, national and international level	Local and regional level / Local, regional and national level	Local and regional level / Local, regional, national and international level	Local, regional and national level / Local, regional, national and international level
Management of the organization	Z	1.685	1.269	-1.483	-0.570	-3.241	-3.036
	p	0.092	0.204	0.138	0.568	0.001*	0.002*
	p-corrected	0.552	1.000	0.828	1.000	0.007*	0.014*

* Statistically significant at the p < 0.05 level

Table 12 lists two *p-values* - the uncorrected empirical level of significance and the one based on the Bonferroni correction. Both *p-values* point to the conclusion that in terms of organization management ratings, there are statistically significant differences between managers of organizations with regional and international levels of recognition and acknowledgment and national and international levels of recognition and acknowledgment. In both cases, managers of organizations recognized and acknowledged internationally rated their organization's management significantly higher than their colleagues. The result obtained is in accordance with their reputation and status and the fact that their organization's work is recognized and acknowledged even beyond national borders, and quality management certainly contributes to that. The results confirmed the second hypothesis of the research (H2): Organizations that are recognized and acknowledged at the international level have better management than other groups of organizations.

The results of the analysis of the significance of the differences in the evaluations of the organization's management and its importance for efficiency and success regarding the granted recognitions/diplomas/awards using the Kruskal-Wallis test are shown in Table 13.

Table 13. Results of the analysis of the significance of the differences in the evaluations of the management of the organization and its importance for the efficiency and success concerning the granted recognitions/diplomas/awards using the Kruskal-Wallis test

Graded element	Granted recognitions/diplomas/ awards (average rank)			Kruskal-Wallis test	
	Yes (national level)	Yes (national and international level)	No	*H*	*p*
Management of the organization	81.06	99.00	100.42	5.684	0.058
The importance of management for the efficiency and success of the organization	80.33	103.60	93.75	10.307	0.006*

* Statistically significant at the p < 0.05 level

The Kruskal-Wallis test does not indicate a statistically significant difference between the groups of managers regarding the recognitions, diplomas and awards granted to their organizations and the evaluated element of the organization's management. However, when it comes to the second element, which

refs to the importance of management for the efficiency and success of the organization, it is evident from the average ranks that this element was valued the highest by managers whose organizations were granted recognitions, diplomas and awards at the national and international level. The Kruskal-Wallis test, in this case, confirms that there are at least two groups of managers who differ significantly in their ratings, so it follows to identify such groups using Dunn's test. The results of the analysis are listed in Table 14.

Table 14. Analysis of the significance of the differences in the evaluations of the importance of management for the efficiency and success of the organization concerning the granted recognitions/diplomas/awards using Dunn's test

Graded element	Dunn's test	Granted recognitions/diplomas/awards (compared groups)		
		Yes (national level)	Yes (national level)	Yes (national and international level)
		Yes (national and international level)	No	No
The importance of management for the efficiency and success of the organization	Z	-3.203	-1.589	1.172
	p	0.001*	0.112	0.241
	p-corrected	0.004*	0.336	0.723

* Statistically significant at the p < 0.05 level

It can be seen that both *p-values* showed that in terms of ratings of the importance of management for the efficiency and success of the organization, there are statistically significant differences between managers of organizations that have been awarded recognitions, diplomas and awards at the national level and managers whose organizations have received recognitions, diplomas and awards for their work at the national and international level. Managers of organizations that were awarded recognitions, diplomas and awards at the national and international level rated the importance of management for the efficiency and success of the organization significantly higher than managers of organizations that received recognitions, diplomas and awards at the national level. It can be concluded, just as in the previous analysis of the results, that the result follows the reputation and status of such organizations and that they received recognitions, diplomas and awards for their work at the national and international level.

Therefore they recognize significantly more how much management is essential and how much it contributes to the efficiency and success of the organization. All of the above confirms the third hypothesis of the research (H3): Managers of organizations that have been granted recognitions, diplomas and awards at the national and international level recognize the importance of management for the efficiency and success of the organization to a greater extent than other managers.

5. CONCLUSION

Quality management represents a vital resource and a possible basis for the success of any organization, including organizations in the field of art. With this research, which included a sample of 184 respondents - managers of professional and amateur music ensembles from all counties of the Republic of Croatia, including the City of Zagreb, it was meant to point out the importance of management for the efficiency and success of organizations in the field of art - music ensembles. The results showed the following:

Respondents evaluated the management of their organization with an average rating of 3.72. At the same time, the higher arithmetic mean was calculated based on their rating related to the importance of management for the efficiency and success of the organization (4.57). Since as many as 90.7% of managers rated the mentioned element as excellent and very good, H1 was confirmed: Management and its fundamental determinants in the operation of organizations in the field of art (musical ensembles) are essential for the efficiency and success of the organization and the achievement of its goals. It is, therefore, possible to state that the obtained results point to the fact that managers are aware of the situation in their organization and see room for improvement in management, as they rated its importance for the efficiency and success of the organization as excellent.

Furthermore, among the compared groups in terms of recognition and acknowledgment of the organization at the local, regional, national and international level, the results showed that managers of organizations that are recognized and acknowledged at the international level rated the management of their organization significantly higher than their colleagues. The obtained result, which follows their reputation and status and the fact that the work of their organization is recognized and acknowledged beyond national borders, to

which quality management certainly contributes, confirmed the second hypothesis of the research (H2): Organizations that are recognized and acknowledged at the international level have better management compared to other groups of organizations.

When it comes to the characteristic of the organization that refers to the granted/received recognitions, diplomas and awards, which indicates its activity, presence and success, the results showed the following: managers of organizations that were granted recognitions, diplomas and awards at the national and international level evaluated the importance of management for the efficiency and success of the organization with significantly higher scores than the managers of organizations that received recognitions, diplomas and awards at the national level. It can be concluded that the result follows the reputation and status of such organizations and the fact that they received recognitions, diplomas and awards for their work at the national and international level. Therefore they recognize significantly more how much management is essential and how much it contributes to the efficiency and success of the organization. All of the above confirms the third hypothesis of the research (H3): Managers of organizations that have been granted recognitions, diplomas and awards at the national and international level recognize the importance of management for the efficiency and success of the organization to a greater extent than other managers.

The conducted research and presented results determined the state of management of organizations in the field of art - musical ensembles from the Republic of Croatia. Since the objectives of the research have been fully achieved and all the hypotheses of the research have been confirmed, it is believed that the established situation will contribute to a stronger reflection of the managers of musical ensembles about the management and improvement of the management of their organizations because, based on their answers, it is evident that they see room for improvement. In the context of the characteristics of the respondents, it is essential to note that it is widespread that managers, whose primary role is the artistic management of the ensemble, in many organizations are also in charge of performing administrative tasks. Often they represent the organization's management. Therefore, it is essential to think about acquiring managerial skills of music ensemble managers within formal, non-formal and informal education. In addition to their dedication to the work of an artistic nature that they primarily deal with, good management will undoubtedly con-

tribute to the overall success and efficiency of their future work, as well as the recognition and reputation of the organization.

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THE ROLE OF INFORMATION TECHNOLOGY IN DECISION-MAKING - LITERATURE REVIEW

Damir TOMIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Education

E-mail: tomic.damir.dj@gmail.com

Abstract

The use of information technology (IT) in decision-making has been the subject of much research in recent years. This literature review aims to investigate the impact of IT on the efficiency and effectiveness of decision-making in organizations and explore the potential benefits and drawbacks of using IT to support data-driven decision-making. Additionally, the review examined the challenges of balancing the benefits of IT with concerns about data privacy and security in the decision-making process. The authors found that IT can positively impact the efficiency and effectiveness of decision-making in organizations through improved data collection, analysis, and dissemination for more informed and strategic decision-making and facilitating communication and collaboration among decision-makers. The literature also highlighted potential drawbacks such as reliance on incomplete or inaccurate data, risk of decision-making becoming overly reliant on technology, cost of implementation and maintenance, risk of technology failure, and the need to protect data privacy and security. The authors recommend that organizations balance the potential benefits of IT with data privacy and security concerns and suggest future research to investigate the impact of balancing IT benefits with privacy and security concerns in decision-making.

Keywords: decision-making, information technology

JEL Classification: D81

1. INTRODUCTION

Information technology has become increasingly prevalent in organizational decision-making as organizations seek to leverage data and analytics to inform their decisions (Turban & Aronson, 2000). However, using information technology in decision-making is not without its challenges. Organizations must balance the potential benefits of the technology with concerns about data privacy and security and navigate the ethical considerations of using technology to support data-driven decision-making (Loock & Hinnen, 2015). In this literature review, we aim to synthesize the existing research on the use of information technology in decision-making, focusing on how it has been used to support data-driven approaches, the potential benefits and drawbacks of these technologies, and the factors that influence their adoption. By understanding the current state of the research on this topic, we hope to shed light on the opportunities and challenges of using information technology in decision-making and to identify areas for future research.

Information technology (IT) uses computers and other technological tools to process, store, and transmit information. It includes various technologies and systems, such as computers, software, networks, databases, and the Internet. Nach & Lejeune (2010) state that information technology (IT) has become more widely used by managers and employees across various fields in recent years. However, to adapt to their new IT environment, organizational actors may need to develop new skills, behaviors, and attitudes while letting go of others, which can challenge their sense of self. IT can change how people work, redefine their roles and expectations, and disrupt the social and psychological processes that help individuals understand their identity and roles.

Decision-making is the process of choosing among alternative courses of action. It involves gathering and evaluating information, considering the potential consequences of different options, and choosing based on this analysis. Decision-making is a critical part of organizational and individual life, and it can involve a range of issues and complexity, from simple daily decisions to long-term strategic planning. According to Oliviera (2002), decision-making has been thoroughly studied in many fields of knowledge. Research has demonstrated that decision-making involves the act of choosing and the resulting behavior and involves the processes of thinking and reacting. A decision is a response to a situation and involves judgment, expectations, and evaluation.

Information technology is often used to support decision-making by providing tools and systems that facilitate the gathering and analysis of information. For example, IT can process and analyze large amounts of data, access and share information with other stakeholders, or support decision-making tools and models. However, using IT in decision-making can also bring challenges, such as data privacy and security concerns or the ethical considerations of using technology to support data-driven decision-making. According to Andersen (2001), we can improve communication and increase management involvement through autonomy and participation by using information technology. This should help to overcome organizational barriers, encourage creativity, and allow for opportunistic business development.

2. METHODOLOGY

The methodology for this literature review will involve a comprehensive and systematic search of various sources, including electronic databases, conference proceedings, and gray literature. Research questions will be established and used as criteria for selecting studies to ensure the review's relevance and quality.

Once the studies have been selected, they will be critically evaluated, and their findings will be synthesized to identify key themes and trends in the existing research on the topic. Multiple databases and sources will be used to minimize the risk of bias in the selection process, and a rigorous review will be implemented.

Another challenge that will be addressed is the potential for inconsistency in the definitions and measures used in the studies. This could make it difficult to compare and synthesize the findings. To mitigate this, we will carefully examine the conceptualization and operationalization of key concepts in the studies and consider this in the analysis.

Ensuring the relevance and timeliness of the review is also crucial. Given that the field of IT and decision-making is constantly evolving, we will focus on recent studies and consider the potential implications of the findings for current and future research and practice. By doing so, we aim to provide an up-to-date and comprehensive overview of the current state of research on the topic.

This study focuses on the use of information technology in organizations and its impact on decision-making. The research questions and hypotheses

proposed in this chapter explore the potential benefits and drawbacks of using information technology to support data-driven decision-making, the impact of information technology on the efficiency and effectiveness of decision-making, and how organizations balance concerns about data privacy and security with the potential benefits of information technology.

Overall, this study sets the foundation for the proposed research by identifying gaps in existing knowledge and presents a straightforward research question to be answered by the proposed study. The following three research questions will be investigated in previous scientific papers and the associated hypotheses.

Q1: How does the use of information technology impact the efficiency and effectiveness of decision-making in organizations?

H1: The use of information technology significantly improves the efficiency and effectiveness of decision-making in organizations. This hypothesis suggests that using information technology improves the speed and accuracy of decision-making in organizations. This could be due to factors such as the ability of technology to process and analyze large amounts of data quickly or access and share relevant information more easily.

Q2: What are the potential benefits and drawbacks of using information technology to support data-driven decision-making?

H2: Using information technology to support data-driven decision-making improves accuracy and efficiency. This hypothesis suggests that information technology can improve the accuracy and efficiency of decision-making by allowing organizations to process and analyze large amounts of data quickly and effectively.

Q3: How do organizations balance the potential benefits of information technology with concerns about data privacy and security in the decision-making process?

H3: Organizations prioritizing data privacy and security in their decision-making processes are more likely to adopt information technology compliant with relevant regulations, with robust security measures in place. This hypothesis suggests that organizations prioritizing data privacy and security in their decision-making processes are more likely to adopt information technology that meets these requirements. This could involve choosing technology compli-

ant with relevant data privacy regulations or that has robust security measures to protect sensitive data.

2.1. Literature Review

This chapter will review the literature with answers to the research questions Q1, Q2, and Q3, and everything will be shown in Table 1.

The analyzed articles answer the research questions in detail. For example, Molloy & Schwenk (1995) discuss that adopting information technology for data processing enhanced the analysis's accuracy, sophistication, and thoroughness in all three decision-making activities. As a result, more alternatives were generated, and the overall quality of the decision-making activities was improved. The use of information technology significantly improves both the efficiency and effectiveness of the decision-making process. Findings show that information technology is a useful decision-making tool in real-world situations. The relationship between information technology use and performance is positive, with higher levels of information technology use associated with better performance in problem decisions compared to crisis decisions. Information technology offers numerous benefits for decision-making, such as the ability to store and retrieve large amounts of information quickly and inexpensively, access external information more efficiently and selectively, combine and reconfigure information more accurately and quickly, store and utilize expert judgments and decision models efficiently, and record and retrieve information about corporate transactions more reliably and inexpensively (Dewett & Jones, 2001).

According to Samimi (2020), it is unfortunate that, despite extensive research, clear and helpful information on how to implement and prioritize the implementation of a system has not been widely available until today. There are various reasons for this, including security concerns for both governmental and non-governmental organizations, as well as the close relationship between the relevant field and the interests of these organizations. Procuring communications, technology, and information systems is critical for organizations to support competitive strategies and improve their service level. Dastan et al. (2011) found that companies should improve and use their knowledge during strategic decision-making. They also observed that information technology training during education is determinative and prepares individuals for the business area they plan to work in. Information processing, communication, and automation

improvements transform inter-organizational informatics actions, integration, and business methods. One of the most significant impacts of information technology on managers and workers is the ability to increase their level of performance through the support of information systems. Another effect of information technology is its ability to assist decision-making by providing accurate and appropriate decision options. The mobilization and interconnectedness of personal insights to form a group's collective intelligence positively impact decision-making.

Additionally, generating and utilizing ideas, products, and resources to increase organizational effectiveness facilitates decision-making activities. Information technology (IT) plays a mediating role in maximizing the value created (Boulesnane & Bouzidi, 2013). According to Daneshvar & Ramesh (2010), small businesses invest in information and communication technologies to expand their information systems and support their business strategy to create a competitive market advantage. When an organization's business strategy is aligned with its information systems strategy, it can positively impact business performance. Top management needs to formulate the business strategy, while the role of the information systems manager is to efficiently and effectively design and implement the necessary information infrastructure and processes that support the chosen business strategy. According to Gupta et al. (2007), several factors can help to increase the effectiveness of information technology (IT) in government organizations, such as strong leadership and managerial awareness of costs and benefits, the centrality of IT to the organization's strategy, top management support, the higher position of the IT manager, falling prices of computers, improved quality of work, ease of tasks, and vendor pressure. However, there were also hindrances to the effective use of IT in these organizations, including a lack of previous experience with IT, high centralization and excessive controls, and IT management being given less importance than top management.

Additionally, the training programs for IT provided by top management were inadequate, and the organization's culture was power-oriented, which hindered the efficient use of IT. Larger organizations tend to have better results in terms of IT effectiveness, and there is a significant positive relationship between organizational culture and IT effectiveness. User satisfaction with IT also has a significant positive impact on IT effectiveness. Information technology can help organizations of all types by reducing costs and expanding their horizons to

search for diverse sources. The study results show a positive correlation between the use of information technology and decision-makers' participation. Technology usage has a statistically significant effect on the participation of decision-makers. The results also indicate differences in the perception of IT employees based on their years of service. However, there were no differences in the participation of decision-making staff based on their years of service (Zaqout et al., 2018). According to Turulja et al. (2016), a research study provides empirical evidence that HRM capability positively impacts a firm's performance. It also shows that HRM capability mediates in maximizing information technology's value for a business. The findings confirm that IT capability alone is insufficient to achieve exceptional business results, but combining it with effective HR practices leads to success.

For decision-makers, findings emphasize the importance of considering the full range of non-IT resources when evaluating the potential impact of IT. Before adopting new IT, firms should carefully consider their unique combination of resources. Understanding how these resources interact can help firms identify which parts of the organization stand to gain the most from IT investments and take proactive steps to minimize conflicts and duplication (Jeffers et al., 2008). It has often been observed that systems can facilitate centralization and impersonal control. Using operational and monitoring control systems tends to reduce adhocracy within organizations. Professional workers tend to be very satisfied with operational information systems because they eliminate tedious tasks and bottlenecks, allowing them to work more efficiently and effectively. This is in contrast to the experiences of non-professional workers, who may not necessarily benefit in the same way from such systems (Wijnhoven, 1990). According to Peterson et al. (2002), case study results suggest that traditional decision-making theories do not provide sufficient guidance for understanding IT governance processes in competitive environments. This study highlights the disconnect between theoretical frameworks, empirical research, and current practices in effective IT governance. These findings should encourage further research on the effective mechanisms of IT governance. Improved information can lead to more effective decision-making by workers and managers. For instance, the store-based system provides information enabling managers to manage inventory more effectively. Significant productivity increases can be achieved by redesigning a process known as transformation impacts. (Dedrick et al., 2003).

Table 1. Literature review

study by	Q1	Q2	Q3
Turban & Aronson, 2000	The authors found that using information technology positively impacts the efficiency and effectiveness of decision-making in organizations. They found that information technology can facilitate information collection, processing, and dissemination, leading to faster and more accurate decision-making.	The authors identify several potential benefits of using information technology to support data-driven decision-making, including increased speed, accuracy, and objectivity of decision-making and improved communication and collaboration among decision-makers. However, they also note potential drawbacks, including the cost of implementing and maintaining the technology, the risk of technology failure, and the need to protect data privacy and security.	The authors discuss the importance of data privacy and security in designing and implementing information systems for decision-making. They suggest that organizations can take several steps to protect data privacy and security, including implementing secure networks and databases, training employees on data protection practices, and establishing policies and procedures for handling sensitive information.
Mandinach, Gummer & Muller, 2011	The authors found that IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination.	The authors found that IT in decision-making can increase accuracy, objectivity, timeliness, and collaboration but also has drawbacks such as cost, failure risk, and privacy concerns.	The authors discuss the importance of leadership in navigating the challenges of using information technology for data-driven decision-making, including the need to balance the potential benefits with concerns about data privacy and security.
Loock & Hinnen, 2015		The authors found that IT in decision-making can provide access to more and better data, improved data analysis and visualization, and faster, accurate decision-making. However, it also has drawbacks like reliance on inaccurate data and technology.	The authors suggest future research to balance the benefits of IT with privacy and security concerns in decision-making, investigate its impact on various types of organizations and industries, and how to integrate IT in decision-making and support data-driven decision-making effectively.

study by	Q1	Q2	Q3
Lengnick-Hall, Neely & Stone, 2018	The authors review the existing literature on the impact of information technology on decision-making in organizations and find that using information technology, particularly analytics and artificial intelligence, can positively impact the efficiency and effectiveness of decision-making. They found that these technologies can facilitate data collection, analysis, and dissemination, leading to more informed and strategic decision-making.	The authors found that the potential benefits of using analytics and artificial intelligence to support data-driven decision-making include improved data analysis and visualization and increased speed and accuracy of decision-making. However, the authors also note potential drawbacks to using these technologies for decision-making, such as a reliance on data that may be incomplete or inaccurate and the risk of decision-making becoming overly reliant on technology.	The authors suggest that organizations balance the potential benefits of analytics and artificial intelligence with data privacy and security concerns in decision-making. They recommend that organizations establish policies and procedures to safeguard sensitive data and ensure employees are adequately trained in privacy and security best practices. Additionally, organizations should consider implementing strict access controls to protect data from unauthorized access and regularly monitoring and testing security systems to ensure they are effective.
Preston, Chen & Leidner, 2008	The authors surveyed managers to investigate the role of information technology in strategic decision-making. They found that using information technology positively impacts the efficiency and effectiveness of decision-making, mainly when it facilitates communication and collaboration among decision-makers.	The potential benefits of using information technology to support data-driven decision-making include access to more and better data, improved data analysis and visualization, and increased speed and accuracy of decision-making. However, the authors also note potential drawbacks to using IT for decision-making, such as a reliance on data that may be incomplete or inaccurate and the risk of decision-making becoming overly reliant on technology.	The authors suggest that organizations need to balance the benefits of IT with data privacy and security concerns by implementing policies and procedures for safeguarding sensitive data, training employees on privacy and security best practices, implementing strict access controls, and regularly monitoring and testing security systems.
Citroen, 2011	The authors reviewed the existing literature on the role of information technology in strategic decision-making processes. They found that information technology positively impacts the efficiency and effectiveness of decision-making, mainly when it facilitates communication and collaboration among decision-makers and supports data-driven decision-making.	The paper's authors found that the potential benefits of using IT to support data-driven decision-making include access to more and better data, improved data analysis and visualization, and increased speed and accuracy of decision-making. However, the authors also note potential drawbacks to using IT for decision-making, such as a reliance on data that may be incomplete or inaccurate and the risk of decision-making becoming overly reliant on technology.	The authors suggest that organizations should consider implementing strict access controls to protect data from unauthorized access and regularly monitoring and testing security systems to ensure they are effective.

study by	Q1	Q2	Q3
Shepherd, Williams & Patzelt, 2015	The authors review existing literature on IT in decision-making and found that it positively impacts efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making.	The authors found that IT in decision-making can provide access to more and better data, improved data analysis and visualization, and faster, accurate decision-making. However, it also has drawbacks like reliance on inaccurate data and technology.	The authors suggest that organizations must balance the potential benefits of IT with concerns about data privacy and security in the decision-making process. They recommend that organizations establish policies and procedures to safeguard sensitive data, train employees on privacy and security best practices, implement strict access controls, and regularly monitor and test security systems to ensure they are effective.
Chengalur-Smith, Ballou & Pazer, 1999	The author surveyed managers to investigate the impact of information technology on decision-making. She found that information technology positively impacts the efficiency and effectiveness of decision-making, mainly when used to facilitate communication and collaboration among decision-makers.	The author found that IT can positively impact decision-making by providing access to more and better data, improved data analysis and visualization, and increased speed and accuracy of decision-making. However, there are potential drawbacks to using IT for decision-making, such as a reliance on data that may be incomplete or inaccurate and the risk of decision-making becoming overly reliant on technology.	The author suggests that organizations balance the benefits of IT with data privacy and security concerns by implementing policies and procedures for safeguarding sensitive data, training employees on privacy and security best practices, implementing strict access controls, and regularly monitoring and testing security systems.
Mitton et al., 2007	The authors found that IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making.	The authors found that IT can positively impact decision-making by providing access to more data, better data analysis, visualization, and faster, accurate decision-making. However, it also has drawbacks, such as reliance on inaccurate data and overreliance on technology.	The authors suggest that organizations balance the benefits of IT with data privacy and security concerns by implementing policies, training employees, implementing access controls, and monitoring security systems.
Lucas Jr & Olson, 1994	The authors reviewed the literature and found that IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making.	The authors found that IT can improve decision-making by providing more data, better analysis and visualization, and faster, more accurate decisions. However, it also has drawbacks, such as reliance on inaccurate data and overreliance on technology.	The authors advise organizations to balance the advantages of IT with data privacy and security issues by creating policies, training staff, implementing access controls, and regularly testing security systems.

study by	Q1	Q2	Q3
Song & Song, 2010	The authors surveyed managers to investigate the role of information technology in strategic decision-making processes. They found that using information technology positively impacts the efficiency and effectiveness of decision-making, mainly when it facilitates communication and collaboration among decision-makers.	The authors found that IT can positively impact decision-making by providing access to more and better information, facilitating communication and collaboration among decision-makers, and supporting the automation of routine tasks. However, they also found that IT can also have a negative impact on decision-making, such as a reliance on data that may be incomplete or inaccurate and the risk of decision-making becoming overly reliant on technology.	The authors suggest that organizations must balance the potential benefits of IT with concerns about data privacy and security in the decision-making process. They recommend that organizations establish policies and procedures to safeguard sensitive data and ensure employees are adequately trained in data privacy and security best practices. Additionally, organizations should consider implementing strict access controls to protect data from unauthorized access and regularly monitoring and testing security systems to ensure they are effective.
Dewett & Jones, 2001	The authors reviewed the literature and developed a model to assess the impact of IT on organizational performance. They found that IT positively impacts performance, mainly by facilitating employee communication and collaboration and supporting data-driven decision-making.	The authors found that IT can provide access to more data, better data analysis and visualization, and faster, more accurate decision-making. However, it also has drawbacks, such as reliance on inaccurate data and overreliance on technology.	The authors suggest that organizations should balance the benefits of IT with data privacy and security concerns by implementing policies and procedures and training employees on best practices.
Samimi, 2020		The article focuses on the concept of risk management in the context of information technology. The author does not explicitly discuss the potential benefits and drawbacks of using IT to support data-driven decision-making. However, the article mentions that risk management can help organizations make better IT decisions.	The author highlights the importance of risk management in IT and the need for organizations to balance benefits with data privacy and security concerns. He discusses various strategies, such as risk assessments, security controls, and contingency plans to mitigate the risks associated with IT.

study by	Q1	Q2	Q3
Dastan, Çiçek & Naralan, 2011	The authors surveyed managers to investigate the effects of information technology-supported education on strategic decision-making. They found that using information technology-supported education positively impacts the efficiency and effectiveness of decision-making, mainly when it facilitates communication and collaboration among decision-makers.	The authors found that IT can provide access to more data, better data analysis, visualization, and faster, more accurate decision-making. However, it also has drawbacks, such as reliance on inaccurate data and overreliance on technology.	
Boulesnane & Bouzidi, 2013	The authors surveyed managers to investigate the mediating role of information technology in decision-making. They found that using information technology positively impacts the efficiency and effectiveness of decision-making, mainly when it facilitates communication and collaboration among decision-makers.	The potential benefits of using IT to support data-driven decision-making include access to more and better data, improved data analysis and visualization, and increased speed and accuracy of decision-making. However, there are potential drawbacks, such as a reliance on data that may be incomplete or inaccurate and the risk of decision-making becoming overly reliant on technology.	The authors suggest that organizations must balance the potential benefits of IT with concerns about data privacy and security in the decision-making process. Organizations should establish policies and procedures to safeguard sensitive data, ensure employees are adequately trained in data privacy and security best practices, implement strict access controls, and regularly monitor and test security systems.
Daneshvar & Ramesh, 2010	The authors review the existing literature on the impact of information technology on competitive advantage from a strategic perspective. They find that information technology positively impacts competitive advantage, mainly when it supports data-driven decision-making and facilitates communication and collaboration among employees.	IT can provide access to more data, better analysis and visualization, and faster and more accurate decision-making. Drawbacks include relying on inaccurate data and overreliance on technology.	The authors recommend that organizations balance the benefits of IT with data privacy and security concerns by creating policies, training staff, implementing access controls, and monitoring security systems.
Gupta et al., 2007	The authors conducted a study on the use of IT in select government organizations in India. They found that it positively impacts decision-making efficiency and effectiveness, mainly when used to facilitate communication and collaboration among employees and support data-driven decision-making.	The benefits of IT are increased efficiency and effectiveness in data collection and analysis, improved data quality and access to real-time data, and enhanced decision-making capabilities. Drawbacks include the high cost of IT systems, the need for regular maintenance, and the risk of data becoming outdated quickly.	The authors suggest that organizations must balance the benefits of IT and the risk of data breaches by implementing strict data security protocols, such as access controls, regular security monitoring, and training employees in best practices.

study by	Q1	Q2	Q3
Zaqout et al., 2018	The study's authors found that using information technology in government organizations in India can improve the efficiency and effectiveness of decision-making by facilitating communication and collaboration among employees and supporting data-driven decision-making.	The study revealed that IT in government organizations has numerous benefits, including increased involvement of administrative staff in decision-making, improved data analysis, access to real-time information, and improved decision-making.	The authors suggest that organizations put strict data security measures, such as access controls, regular security monitoring, and employee training on best practices, to balance the advantages of IT and the risk of data breaches.
Turulja & Bajgorić, 2016	The study's authors discovered that IT utilization in Indian government organizations could enhance decision-making efficacy and efficiency by improving employee communication and collaboration and supporting data-driven decision-making.	The study found that companies in the digital era must balance the importance of human resources and information technology. Human resources are crucial for the company's growth, while information technology enables communication and data processing.	The authors recommend that companies balance human resources and technology by creating a secure and reliable system that protects data privacy. This can be achieved by implementing strict data security protocols and regular security monitoring.
Jeffers, Muhanna & Nault, 2008	The authors found that IT improves process performance when paired with non-IT resources, such as human capital and physical infrastructure, through their empirical investigation of IT and non-IT resources' impact on organizational process performance.	The study found that IT positively impacts process performance but is stronger when combined with other non-IT resources.	The authors suggest that organizations must balance the advantages of IT with the risk of data breaches by implementing strict data security protocols, like access controls, regular security monitoring, and training employees in best practices for data security.
Wijnhoven, & Wassenaar, 1990	The authors conducted a review of the literature on the effects of IT on organizations. They found that the use of IT has a positive impact on decision-making efficiency and effectiveness. This is particularly true when IT enhances employee communication and collaboration and supports data-driven decision-making.	The study found that IT provides several benefits, such as increased efficiency and effectiveness in data collection and analysis, improved data quality, and access to real-time data. Additionally, it enhances decision-making capabilities. However, the study also found that IT systems can be costly, require regular maintenance, and data can become outdated quickly, which are some drawbacks.	The authors suggest that organizations should establish policies and procedures to protect sensitive data, train employees in best practices for data security, implement strict access controls, and regularly monitor and test security systems to balance IT benefits with the risk of data breaches.

study by	Q1	Q2	Q3
Peterson, Parker & Ribbers, 2002	The study found that IT can positively impact decision-making by providing access to more and better information and facilitating knowledge sharing.		The authors investigate the use of information technology governance processes in organizations operating in dynamic environments. They find that organizations must balance the potential benefits of information technology with concerns about data privacy and security in the decision-making process and that the appropriate governance approach depends on the organization's specific context.
Dedrick, Gurbaxani & Kraemer, 2003	The authors critically review the empirical evidence on the impact of information technology on economic performance. They find that information technology positively impacts economic performance, mainly when it supports data-driven decision-making and facilitates communication and collaboration among employees.		
Tseng, Wu & Nguyen, 2011	The authors conduct a case study of the use of information technology in supply chain management in a Taiwanese manufacturing company. They find that information technology positively impacts the efficiency and effectiveness of decision-making in the supply chain, mainly when it facilitates communication and collaboration among supply chain partners and supports data-driven decision-making.		

study by	Q1	Q2	Q3
Gunasekaran, Ngai & McGaughey, 2006	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations.	The potential benefits of using information technology to support data-driven decision-making include access to a broader range of information, faster processing of data, and improved collaboration among decision-makers. Potential drawbacks include an overreliance on automated decision-making systems and a lack of transparency in the decision-making process.	
Groen et al., 2015	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations.	The potential benefits of using information technology to support data-driven decision-making include access to a broader range of data, faster processing of information, and improved collaboration among decision-makers. Potential drawbacks include an overreliance on automated decision-making systems and a lack of transparency in the decision-making process.	Organizations need to balance the potential benefits of information technology with concerns about data privacy and security in the decision-making process.
Er, 1989	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations. However, the impact can vary depending on the specific context in which it is used.	The study found that using IT to support data-driven decision-making can have several benefits, such as access to a broader range of data and faster information processing. However, it also found potential drawbacks, such as overreliance on automated decision-making systems and lack of transparency in the decision-making process.	
Chaudhuri et al., 2018	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations.	The authors discovered that utilizing IT to aid data-driven decision-making can bring advantages like access to more data and faster information processing. However, they also found potential downsides, such as becoming overly dependent on automated decision systems and lacking visibility in decision-making.	Organizations must carefully consider the potential risks and benefits of using information technology in decision-making and ensure adequate safeguards to protect against data privacy and security breaches.

study by	Q1	Q2	Q3
Huber, 2009	The study found that using information technology can enhance the efficiency and effectiveness of decision-making in organizations.	The study found that using IT to support data-driven decision-making can have several benefits, such as access to a broader range of data, faster processing of information, and improved collaboration among decision-makers. However, it also found potential drawbacks, such as overreliance on automated decision-making systems and lack of transparency in the decision-making process.	The study suggests that organizations should weigh the potential risks and benefits of using IT in decision-making and have sufficient safeguards to protect against data privacy and security breaches.
Kelton, Pennington & Tuttle, 2010	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations. However, the impact can vary depending on the specific context in which it is used.	The study found that IT can improve data-driven decision-making by providing access to more data, faster information processing, and better collaboration among decision-makers. However, overreliance on automated decision systems and lack of transparency in decision-making can be potential downsides.	
Soudani, 2012	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations.	The potential benefits of using information technology to support data-driven decision-making include access to a broader range of data, faster processing of information, and improved collaboration among decision-makers. Potential drawbacks include an overreliance on automated decision-making systems and a lack of transparency in the decision-making process.	The study suggests that organizations must consider the risks and benefits of using IT in decision-making and ensure sufficient safeguards to protect against data privacy and security breaches. Organizations need to recognize that while IT can bring significant advantages in data collection, analysis, and decision-making, it also introduces new risks and challenges that must be mitigated. Therefore, organizations must have clear policies, procedures, and protocols to protect sensitive data and ensure employees are properly trained in best practices for data security. Additionally, regular monitoring and testing of security systems should be conducted to detect and address any vulnerabilities.

study by	Q1	Q2	Q3
Provost & Fawcett, 2013	The use of information technology can have a positive impact on the efficiency and effectiveness of decision-making in organizations. However, the impact can vary depending on the specific context in which it is used.	The study found that using IT to support data-driven decision-making can bring advantages such as access to a broader range of data, faster information processing, and improved collaboration among decision-makers. However, it also identified potential drawbacks such as overreliance on automated decision-making systems and lack of transparency in the decision-making process.	

Source: Survey results by author

3. RESULTS AND DISCUSSION

In this paragraph, we remind you of the research questions and give answers to how many studies have answered a particular question and what the answers to those questions mean. Questions are:

Q1: How does the use of information technology impact the efficiency and effectiveness of decision-making in organizations?

Q2: What are the potential benefits and drawbacks of using information technology to support data-driven decision-making?

Q3: How do organizations balance the potential benefits of information technology with concerns about data privacy and security in the decision-making process?

Finally, we can provide unified answers to the research questions:

Q1: The authors found that using information technology positively impacts the efficiency and effectiveness of decision-making in organizations. They found that IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making. Additionally, IT can facilitate communication and collaboration among decision-makers and support data-driven decision-making. Some studies also found that IT-supported education positively impacts the efficiency and effectiveness of decision-making.

Q2: The authors found that using information technology to support data-driven decision-making can have several potential benefits, including access to more and better data, improved data analysis and visualization, and increased speed and accuracy of decision-making. However, they also noted that there are potential drawbacks to using IT for decision-making, such as a reliance on data that may be incomplete or inaccurate, risk of decision-making becoming overly reliant on technology, cost of implementing and maintaining the technology, risk of technology failure, and the need to protect data privacy and security.

Q3: The authors suggest that organizations must balance the potential benefits of information technology (IT) with data privacy and security concerns in the decision-making process. They recommend that organizations establish policies and procedures to safeguard sensitive data, train employees on privacy and security best practices, implement strict access controls, and regularly

monitor and test security systems to ensure they are effective. Additionally, they suggest that leadership plays an important role in navigating the challenges of using IT for data-driven decision-making and suggest future research to investigate the impact of balancing IT benefits with privacy and security concerns in decision-making in various types of organizations and industries.

Overall, the authors of these studies found that using information technology (IT) can positively impact the efficiency and effectiveness of decision-making in organizations. Regarding Q1, the authors found that IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making. Additionally, IT can facilitate communication and collaboration among decision-makers and support data-driven decision-making. Some studies also found that IT-supported education positively impacts the efficiency and effectiveness of decision-making.

Regarding Q2, the authors found that using information technology to support data-driven decision-making can have several potential benefits, such as access to more and better data, improved data analysis and visualization, and increased speed and accuracy of decision-making. However, they also noted that there are potential drawbacks to using IT for decision-making, such as a reliance on data that may be incomplete or inaccurate, risk of decision-making becoming overly reliant on technology, cost of implementing and maintaining the technology, risk of technology failure, and the need to protect data privacy and security.

Regarding Q3, the authors suggest that organizations must balance the potential benefits of IT with concerns about data privacy and security in the decision-making process. They recommend that organizations establish policies and procedures to safeguard sensitive data, train employees on privacy and security best practices, implement strict access controls, and regularly monitor and test security systems to ensure they are effective. Additionally, they suggest that leadership plays an important role in navigating the challenges of using IT for data-driven decision-making and suggest future research to investigate the impact of balancing IT benefits with privacy and security concerns in decision-making in various types of organizations and industries.

In summary, the authors found that IT can positively impact the efficiency and effectiveness of decision-making in organizations but also highlighted the

need for organizations to balance the potential benefits with concerns about data privacy and security. Future research must investigate the impact of balancing IT benefits with privacy and security concerns in decision-making in various organizations and industries.

According to the hypotheses proposed in the research questions, the answers suggest that:

The use of information technology has a positive impact on the efficiency and effectiveness of decision-making in organizations. This is in line with H1, which suggests that IT leads to tangible improvements in the speed and accuracy of decision-making.

Using information technology to support data-driven decision-making improves decision accuracy and efficiency. This aligns with H2, suggesting that using IT to support data-driven decision-making can improve accuracy and efficiency.

Organizations prioritizing data privacy and security in their decision-making processes are more likely to adopt information technology compliant with relevant regulations and with robust security measures in place. This is consistent with H3, which suggests that organizations prioritizing data privacy and security in their decision-making processes are more likely to adopt information technology that meets these requirements.

Overall, the answers align with the hypotheses proposed in the research questions and suggest that information technology can positively impact decision-making. However, organizations must also consider data privacy and security concerns.

Regarding the problem of how many studies answered a particular question, we can say that most of the studies, almost three-quarters (29), dealt with question 1. Nearly the same number of studies, over four-fifths (28), addressed question 2, and around three-fifths (25) of the studies focused on question 3. (Figure 1.) Therefore, a significant portion of the studies mainly dealt with problems from all three research questions, with some studies addressing two and only a few addressing only one.

Figure 1. Number of studies answered on research questions
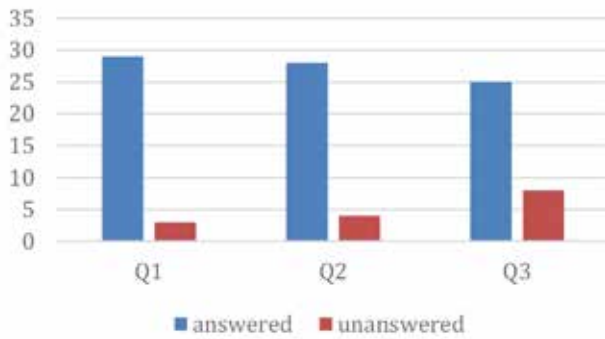
The authors of these studies found that using information technology (IT) can positively impact the efficiency and effectiveness of decision-making in organizations. IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making and facilitates communication and collaboration among decision-makers. However, the authors also noted potential drawbacks such as reliance on incomplete or inaccurate data, risk of decision-making becoming overly reliant on technology, cost of implementing and maintaining the technology, risk of technology failure, and the need to protect data privacy and security. They recommend that organizations establish policies and procedures to safeguard sensitive data, train employees on privacy and security best practices, implement strict access controls, and regularly monitor and test security systems to ensure they are effective. They also suggest that leadership is essential in navigating the challenges of using IT for data-driven decision-making.

There are several potential areas for future research in IT and decision-making. One area is investigating the impact of IT-supported education on decision-making efficiency and effectiveness. Another area is examining the role of leadership in navigating the challenges of using IT for data-driven decision-making. A third area is investigating the impact of balancing IT benefits with data privacy and security concerns in decision-making in different organizations and industries. Another potential area for research is exploring the use of AI and machine learning to support decision-making and its impact on efficiency and effectiveness.

Additionally, examining the effect of IT-based communication and collaboration tools on decision-making could be a good area for investigation. Another area for research is investigating the long-term impact of IT on decision-making in organizations. Finally, evaluating the cost-benefit of IT implementation and maintenance in decision-making processes is essential for future research. By exploring these different areas, researchers can better understand how IT can effectively support decision-making in various contexts.

Further research is needed to understand the impact of specific IT tools (e.g., data visualization, predictive analytics, machine learning algorithms) on decision-making in various contexts. More research is needed to understand how IT can facilitate group decision-making and how IT-mediated decision-making processes impact group dynamics. Research could be conducted to understand how IT can perpetuate or mitigate decision-making biases and how these biases can be reduced through IT interventions. Further research is needed to assess the long-term impact of IT on decision-making processes and outcomes, including both positive and negative impacts. It could examine the role of IT in ethical decision-making and how it can be used to support ethical decision-making processes. More research is needed to understand how IT can be integrated into decision-making education and training programs to improve decision-making outcomes.

4. CONCLUSION

The authors of studies presented in this paper found that using information technology (IT) can positively impact the efficiency and effectiveness of organizational decision-making. They found that IT improves decision-making efficiency and effectiveness through data collection, analysis, and dissemination for more informed and strategic decision-making. Additionally, IT can facilitate communication and collaboration among decision-makers and support data-driven decision-making. However, there are also potential drawbacks to using IT for decision-making, such as a reliance on data that may be incomplete or inaccurate, risk of decision-making becoming overly reliant on technology, cost of implementing and maintaining the technology, risk of technology failure, and the need to protect data privacy and security. The authors suggest that organizations must balance the potential benefits of IT with concerns about data privacy and security in the decision-making process. Overall, the research suggests that

while IT can positively impact decision-making in organizations, it is essential to consider the potential drawbacks and balance the benefits with concerns about data privacy and security.

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IS THERE A RELATIONSHIP BETWEEN CITIZENSHIP COMPETENCE AND MIGRATION? [1]

Ana ŠTAMBUK, Ph.D.
University of Rijeka, Faculty of Economics and Business

E-mail: ana.stambuk@efri.hr

Abstract

Migration is a current research topic, but there is little work on the relationship between competencies and migration. Research on citizenship competence as one of the eight lifelong learning competencies and its relationship with migration is negligible, which raises the question of whether the reason is the newness of the topic, the topic is not interesting, or no significant relationship is found between these two phenomena. As part of the research on labor force mobility and competencies, an attempt was made to answer whether there is a direct relationship between citizenship competence and migration among economics and business administration students. Methods of non-parametric statistics were used. The results of testing the relationship between citizenship competence variables and students' migration intentions indicate no significant direct relationship between citizenship competence and migration. It is suggested that the indirect relationship be investigated in further research.

Keywords: migrations, citizenship competence, labor force mobility

JEL Classification: F22, I23, J11, J61

1. INTRODUCTION

Croatia is facing a demographic aging of the population. This is due to the natural and mechanical movement of the population. Fertility, as a component of natural movement, is low; the total fertility rate in 2020 was 1.48 (Croatian

Bureau of Statistics, 2022: 21), below the replacement rate of 2.1. One component of the mechanical population that contributes to the demographic aging of the population is emigration. The so-called "brain drain", the emigration of highly educated residents, is a particularly pronounced problem. Croatia has invested heavily in such a population, but these highly educated workers do not participate in the Croatian labor market and do not contribute to Croatia's growth and development; instead, they participate in the labor market of the country to which they migrated and contribute to that country's growth and development. The country of immigration, on the other hand, receives highly educated workers, for whose education it did not have to spend any resources. In this way, Croatia has costs on the one hand, and on the other hand, it develops more slowly than the immigration countries. One could say that Croatia finances the development of other countries.

This paper aims to contribute to the research on the relationship between education and migration. The European Commission (2019) defines eight key competencies of lifelong learning: 1) literacy competence, 2) multilingual competence, 3) mathematical competence and competence in science, technology, and engineering, 4) digital competence, 5) personal, social and learning to learn competence, 6) citizenship competence, 7) entrepreneurship competence, and 8) cultural awareness and expression competence. This paper focuses on citizenship competence and investigates whether there is a relationship between citizenship competence and migration among the future highly educated population, in this case, among economics and business students.

As can be seen from the literature review, there is very little work on the relationship between citizenship competence and migration, raising the question of whether the novelty of the topic, lack of interest, or no significant relationship has been found between these two phenomena.

2. LITERATURE REVIEW

There are numerous works on the demographic aging of the Croatian population and migrations, some of which are listed below. Demographic aging of the population is addressed by Jurić (2021), Murgić et al. (2019), Peračković and Pokos (2015), Nejašmić and Toskić (2013), Biljan-August et al. (2012, 2005), Štambuk (2007). Migrations in Croatia have been studied in the works of Buterin et al. (2022), Rijavec et al. (2021), Kolčić and Polašek (2019), and Geddes and Taylor (2016).

Higher education and competencies are current research topics that have been addressed in Croatia by Radić and Paleka (2020), Nikolic et al. (2017), Legčević et al. (2016), Hunjet et al. (2015), Krajina and Turkalj Krajina (2014), Cerović et al. (2014), Obadić and Aristovnik (2011), among others. The relationship between competencies and the labor market is studied by Håkansson and Bejakovic (2020), Štambuk et al. (2020, 2019), Škrinjarić and Domadenik (2019), Bušelić and Kovačević (2016), Karačić, et al. (2015), Maslić et al., (2015), Bejaković, (2014), Hunjet and Kozina (2014), Babić et al. (2006), among others.

There are few publications on the relationship between competencies and migration in Croatia. This area has been studied by Müller and Vizentaner (2017), Sedlan Kőnig (2022), Štambuk et al. (2022), and Cvečić and Host (2022).

The search for works dealing with the relationship between citizenship competencies and migration showed that this is an unexplored topic in Croatia and the world literature. A search in the Web of Science database for the terms "citizenship competence" and migration, with no additional restriction to Croatia, did not yield a single work; in the Scopus database, there were two works: Awada (2017) and Karssen et al. (2015), while in the CROSBI database, there was not a single paper. A broader search in Google Scholar yielded 434 results, of which 231 were published in the last five years. As a result of the literature search, the question arises as to why there are not more articles on the topic of the relationship between citizenship competence and migration, whether the reason is the novelty of the topic, uninterestingness, or the fact that no significant relationship was found between these two phenomena.

3. DATA AND METHODOLOGY

This paper examines whether there is a direct relationship between citizenship competence and migration. Investigating the indirect relationship is outside the scope of this work but may be a continuation of the research.

3.1. Data

To collect data on the relationship between competencies and migration, a survey was conducted at the Faculty of Economics and Business of the University of Rijeka as part of the project MC (migration challenges) - yesterday, today, and tomorrow. The survey was conducted in February 2022. This survey's

target population is full-time economics and business administration students residing in Croatia, and the survey was completed by 661 of these students.

Citizenship competencies and migration were examined through the self-assessment of the surveyed students with a score from 1 to 5, where 1 represents strongly disagree, and 5 represents strongly agree.

Citizenship competencies were examined through three statements:

- ✦ CC1 - I behave following society's formal and informal rules of conduct.
- ✦ CC2 - I support diversity (age, gender, race, nationality, religion, etc).
- ✦ CC3 - I actively participate in the local community to solve everyday problems.

Migration intentions were assessed using the following statement:

- ✦ MI - In the next five years, I plan to migrate abroad.

Descriptive statistics of responses to each statement are presented in Table 1.

Table 1. Descriptive statistics of responses to survey statements

Statement	N	Mdn (IQR)	Mode
CC1	656	5 (4 – 5)	5
CC2	658	5 (5 – 5)	5
CC3	656	3 (2 – 4)	3
MI	656	2 (1 – 3)	1

Source: author's calculation

3.2. Methodology

The relationship between citizenship competencies and migration was analyzed graphically using side-by-side charts.

Since all variables are ordinal, the relationship between citizenship competencies and migration was examined using non-parametric correlation methods: Spearman's and Kendall's tau-b correlations.

To further investigate the possibility of a relationship between the variables, the variable of migration intentions with points from 1 to 5 was transformed into a dichotomous variable, "In the next five years, I plan to migrate abroad, "which can take the values "No "and "Yes ". The transformation was done in such a way that responses 1 and 2 are treated as "No" and responses 4 and 5 as "Yes",

excluding those who are neutral toward migration planning, i.e., i.e., those who answered "3" to the migration planning question. This transformation results in a loss of information, but there is the possibility of observing a significant relationship that was not previously observed.

Using these adjusted data, non-parametric methods were conducted to compare the citizenship competence of students not planning to migrate and students planning to migrate. The following methods were used: Mann-Whitney test and Kolmogorov-Smirnov two-sample test.

Finally, the citizenship competence variables were transformed into "No" and "Yes" responses like the migration intentions variable. The dichotomous variables of migration intentions and citizenship competence were tested using the chi-square test.

All tests were performed at a significance level of $\alpha=0.10$.

4. RESULTS

Figures 1 through 3 show side-by-side graphs of the responses to each statement on citizenship competence and migration.

Figure 1 compares migration intentions and the first question on citizenship competence: CC1 - I behave following society's formal and informal rules of conduct.

Figure 1. Side-by-side chart of migration intentions and CC1
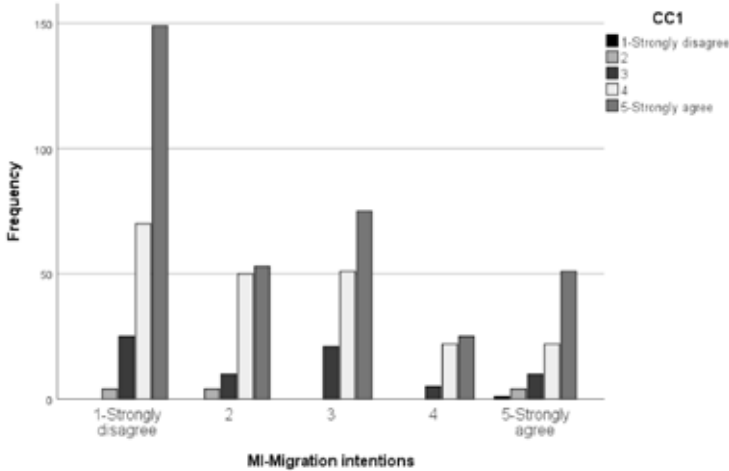
Source: author's calculation

From Figure 1, it can be concluded that there is no difference in the structure of responses to the statement CC1 for different responses about migration intentions.

Figure 2 compares migration intentions and the second question on citizenship competence: CC2 - I support diversity (age, gender, race, nationality, religion, etc...).

Figure 2. Side-by-side chart of migration intentions and CC2
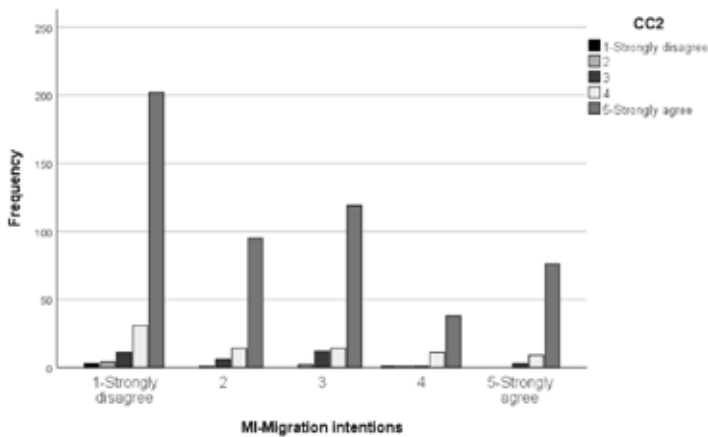
Source: author's calculation

Figure 2 shows that there is also no significant difference in responses at all levels of migration intention for the second question on citizenship competence - CC2.

A comparison between migration intentions and the third question on citizenship competence: CC3 - I actively participate in the local community to solve common problems is shown in Figure 3.

Figure 3. Side-by-side chart of migration intentions and CC3
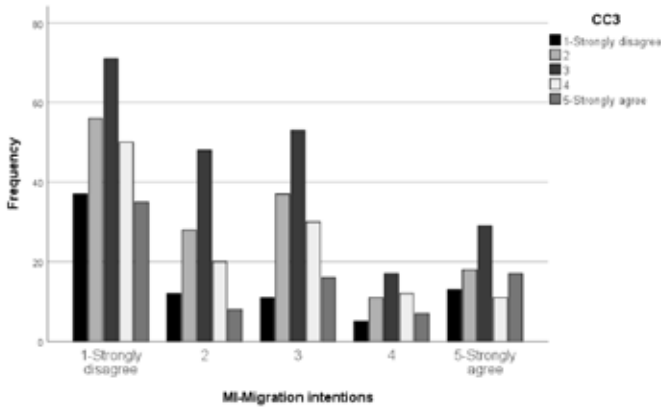
Moreover, for the third question about citizenship competence, it is evident from Figure 3 that there are no differences in the answers regarding migration intentions.

Figures 1 through 3 show no relationship between students' migration intentions and citizenship competence.

The results of the non-parametric correlation methods are presented in Table 2, which shows the correlation between migration intentions and each of the citizenship competency assessment variables.

Table 2. Non-parametric correlations of migration intentions and citizenship competence variables

Statement		
CC1	-0.055	-0.048
CC2	0.018	0.016
CC3	0.026	0.022

Notes:
– Spearman's non-parametric correlation; – Kendall's tau-b non-parametric correlation.
Source: author's calculation

Table 2 shows low non-parametric correlations of migration intentions and citizenship competence variables. However, more importantly, none of the correlations are statistically significant at the α=0.10 level. This is true for Spearman's and Kendall's tau-b non-parametric correlations.

After applying the methods suitable for the analysis of ordinal variables, instead of the variable of intention with five response levels, a dichotomous variable with the answers "No" and "Yes" is included in the analysis, according to the methodology mentioned before.

A comparison of the median and rank of the citizenship competence variables for the two migration groups and the Mann-Whitney test are presented in Table 3.

Table 3. Comparison of citizenship competencies of students who do not plan to emigrate and those who do: median (Mdn), rank (R), and Mann-Whitney test

Statement	Mdn (R)		Mann-Whitney	
	MI = „No"	MI = „Yes"	U	p
CC1	5 (254.52)	5 (249.03)	24994.500	0.672
CC2	5 (253.34)	5 (255.73)	25448.000	0.810
CC3	3 (249.63)	3 (261.79)	24320.000	0.388

Note: CC1-CC3 – questions assessing citizenship competence; MI - intention to emigrate in the next five years
Source: author's calculation

Based on the results of the Mann-Whitney test, at a significance level of α=0.10, the hypothesis of equal distribution of citizenship competence between students who do not intend to emigrate in the next five years and those who do is not rejected.

The results of the two-sample Kolmogorov-Smirnov test comparing the distributions of the citizenship competence variables of students who do not intend to migrate and those who do are presented in Table 4.

Table 4. Comparison of citizenship competencies of students who do not intend to migrate and those who do: Kolmogorov-Smirnov two-sample test

Statement	Z	p
CC1	0.252	1.000
CC2	0.254	1.000
CC3	0.539	0.933

Note: CC1-CC3 – questions assessing citizenship competence
Source: author's calculation

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The Kolmogorov-Smirnov two-sample test at the significance level α=0.10 did not reject the hypothesis about the equality of the distribution of students concerning their migration intentions.

The results of the chi-square test for the dichotomously transformed variables of migration and citizenship competence are presented in Table 5.

Table 5. Comparison of dichotomously transformed variables of citizenship competencies of students who do not intend to migrate and those who do intend to migrate: Chi-square - test

Statement			p
CC1	0.811	-0.042	0.368
CC2	0.323	0.026	0.570
CC3	0.451	0.036	0.502

Notes:
CC1-CC3 – questions assessing citizenship competence
 – chi-square; – Phi
Source: author's calculation

The chi-square test did not reject the hypothesis about the independence of citizenship competencies and migration intentions at the level α=0.10.

5. CONCLUSION

Although migration is a timely topic, there is little research on the relationship between competencies and migration. Work on citizenship competence as one of the eight lifelong competencies and its relationship to migration is negligible. This paper attempted to answer whether there is a direct relationship between citizenship competence and migration among economic and business administration students.

Non-parametric correlation methods were used: Spearman's and Kendall's tau-b, which did not reveal a relationship. To find a relationship between citizenship competence and students' migration intentions, variables were transformed with the risk of information loss. Comparing two samples of the distribution of citizenship competence of students who do not intend to migrate and students who do intend to migrate using the Mann-Whitney test and the two-sample Kolmogorov-Smirnov test revealed that the hypothesis that the distributions

are equal cannot be rejected. By further transforming the variables, in which the citizenship competence variables were transformed into dichotomous variables, the chi-square test also failed to reject the hypothesis of independence of the citizenship competence and migration intention variables. All hypotheses were rejected at the significance level α=0.10.

Thus, it can be concluded that there is no significant relationship between citizenship competencies and migration, at least not a direct one. As a continuation of the research, the possible existence of an implicit relationship can be investigated.

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ANALYSIS OF THE FACTORS OF INFORMATIZATION AND DIGITAL ENTREPRENEURSHIP IN THE DEVELOPMENT OF START-UP COMPANIES IN CROATIA[1]

Slavomir VUKMIROVIĆ, Ph.D.
University of Rijeka, Faculty of Economics

E-mail: slavomir.vukmirovic@efri.hr

Mirjana GRČIĆ FABIĆ, Ph.D.
University of Rijeka, Faculty of Economics

E-mail: mirjana.grcic.fabic@efri.hr

Antonia DŽIDO, mag oec.
University of Rijeka, Faculty of Economics

E-mail: antonia.dzido@gmail.com

Abstract

This paper systematically presents the factors of the development, use and impact of information and communication technology (ICT) and digital entrepreneurship on the development of start-up companies. By methodically structuring and linking the factors of ICT and digital entrepreneurship development in start-up companies, new insights can be gained into how concepts, methods and technologies can be used in the development of start-up companies. Identifying the critical factors of ICT in the development of start-up companies creates the basis for building a methodological framework for the strategic development of start-up companies and other organizations (small and medium-sized enterprises, large companies and corporations). The empirical research has been conducted on 32 start-up companies in Croatia. In general, the results suggest

that the systematic development and synergistic connection of information and communication technologies factors can be linked to realizing business effects in Croatian start-up companies. The research results further indicate that the application of business intelligence achieves a significant connection with identifying business opportunities in the market, creating sustainable competitiveness, and the ability to partner or integrate systems with other companies. According to the research findings, implications for research and practice are suggested.

Keywords: *information and communication technology, digital entrepreneurship, start-up companies, development, business effects*

JEL Classification: *M13, M15*

1. INTRODUCTION

Start-ups are the leading actors in creating the digital economy and the efficient mechanism to implement the benefits of applying digital technology in the economy and society. A start-up is a company to expand and multiplies and creates a repetitive and scalable economic model based on an innovative entrepreneurial concept (European Commission, 2020; Ries, 2011; Damodaran, 2009; Blank, 2005). In the literature, the term "start-up" is sometimes perceived differently and is often equated with a newly founded company, i.e., a particular stage of development of the company (The World Bank, 2018; GEM, 2016). However, what distinguishes a start-up from other business entities is the high degree of innovation of the business concept, i.e., the business model and the significant potential for rapid growth and scaling of business activities. It is the application of digital technology that enables start-ups to achieve a scalable business model (Huang et al., 2017; Nambisan, 2017; van Welsum, 2016) and consequently have a significant impact on the growth and development of economic activities (Ivanović-Đukić et al., 2019; Steve & Dorf, 2014; Moreno & Casillas, 2007). This is especially evident in challenging economic crisis periods, such as when doing business during the COVID-19 pandemic. The crisis of COVID -19 accelerated the digital transformation of national economies and encouraged entrepreneurs to create innovative digital solutions. Digital start-ups are a source of significant potential for increasing the innovation and competitiveness of economies and achieving the economic growth and development needed to recover economies in pandemic conditions (Skawinska & Zalewski, 2020; The State of European Tech, 2020).

Successful start-up companies have recognized that the essential requirement for successful and effective computerization of the business system is connecting and integrating information system activities with the company's business activities. In practice, it has been shown that reducing costs without consolidating and adapting IT solutions and introducing innovations will not solve business problems in the long run (Evello, 2012). Incorporating the investment of IT into the company's development budget, systematic analysis of the specific and synergistic impact of ICT on the business and success of start-up companies, and information and close cooperation in the implementation of informatization through project methods and research are the guarantors of successful informatization of start-up companies. In this way, it becomes easier to understand the possibilities of using and the impact of information and communication technologies on achieving business goals, such as cost optimization, productivity increase, and business process improvement.

Based on such questions and research problems, the research object was to investigate the relevant characteristics and influence of strategic development and systematic linking of information and communication technologies on the success of Croatian start-up companies.

Following the problem and the research goal, a hypothesis was set. Through the systematic analysis and identification of the critical factors of information and communication technologies (ICT), it is possible to form guidelines for the development of informatization in Croatian start-up companies based on the synergistic connection of the critical factors of ICT in the function of business success of start-up companies.

2. LITERATURE REVIEW AND HYPOTHESES

2.1. Start-up entrepreneurship

Start-up entrepreneurship is a term that has only recently become established in the global economy, i.e., in the last fifty years. The term "start-up" is ambiguous, and various interpretations can be found in professional literature and sometimes in academic literature. Blank (2005) set one of a start-up's first and most famous definitions: "A start-up is a temporary organization constantly searching for a repeatable and scalable business model." However, this definition is concise and broad enough to capture what these actors do. The term itself was

initially often understood in the literature as an organization in the making, and a start-up is often equated with a newly formed company. Nevertheless, the start-up concept has recently gained consensus among both academics and political representatives.

The leading institution in the field of start-up development and promotion, the European Start-up Monitor (ESM), defines a start-up through three characteristics (European Start-up Monitor, 2019/2020): 1) a company that is younger than ten years, 2) develops an innovative product and/or service and/or business model, and 3) aims for scalability (aspires to a noticeable increase in the number of employees and/or revenue and/or the market in which it operates). The above characterization is consistent with Blank's (2005) definition. The characteristic of innovation and the ability to scale are key factors that distinguish start-ups from other newly established organizational entities.

In the EU Start-up Monitor report (2018), the European Commission provides an overview of the observed parameters of start-up entrepreneurship, from which it can be concluded that the capital required for the growth of start-ups is generally significantly higher than for the growth of other entities in the small and medium-sized enterprise sector. Moreover, the sources of funding are different; In contrast, the source of funding for a small and medium enterprise is usually a bank loan, a bank loan is a necessity for start-up funding only when other options are not used (equity, help from family and friends, business angels, venture capital funds). As noted earlier, Blank (2013) points out that a start-up must simultaneously strive for "business model repeatability" (the ability to achieve business model sustainability in consistently generating profits) and "scalability" (the ability to profitably serve a growing number of customers, i.e., the ability to improve performance at low cost rapidly).

For start-up entrepreneurship to be solid and stimulating, the quality and sustainability of the entrepreneurial ecosystem created by the government of any country through its actions and policies via state institutions or cooperation with other social institutions that can contribute to the development of the economy of a given country, but also more broadly, in the case of internationalization of businesses, is crucial. The entrepreneurial ecosystem provides conditions for faster and more efficient development of digital start-ups. Essentially, digital technology and the financial capital of investors enable start-ups to achieve a scalable business model and significantly contribute to economic development.

2.2. Theoretical determinants of information and communication technologies (ICT) factors in the company's operations

Information technology is recognized as a source of value creation and a critical factor in the sustainable success of enterprise systems and is used in the informatization of enterprise systems. To become a strategic factor in the success of a business system, information technology should be intensively connected with business and gradually evolve into a business technology whose main objective is no longer to support the business but to enable it to exist.

The change from information technology (IT) to business technology (BT) is certainly much more than just a change of acronym. At its core, it is a change in corporate culture that affects not only the IT department and its employees but the entire organization, from the board of directors to senior management to the lowest-level employees (Sesvećan, 2008). Managers are becoming aware that information systems activities are not separate and independent from the company's other business activities. Including IT investments in the company's development budget, information, and close collaboration in project implementation through project methodologies guarantee project success. In this way, it becomes easier to understand and communicate management's ideas and corporate goals, such as cost optimization, productivity increase, and business process improvement. In practice, it has been shown that cost reduction will not solve business problems in the long run without the consolidation and adaptation of IT solutions and the introduction of innovations. Comprehensive integration of business becomes a necessity (Evello, 2012 as cited in Čičin-Šain, Vukmirović & Čičin-Šain 2013).

Identifying the critical factors for the development of information technology creates the basis for building a methodological framework for the strategic development of the information system. A comparative analysis of the critical factors from the point of view of the period of information system development shows the fundamental trends in the development of information technology as a function of the transition from traditional methods of business planning to advanced methods of information system development (Vukmirović & Čapko, 2009).

In defining the critical factors of information and communication technologies and services as a starting point, studies were used to identify the critical

factors for the development of information systems in organizations in the United States, conducted by the Managerial Information Systems Research Center (MISRC) at the College of Minnesota and the Institute for Information Management (SIM) (Brancheau, Janz & Wetherbe, 1996), Results of an international study: Issues, Investments, Concerns, and Practices of Organizations and their IT Executives (Derksen & Luftman, 2015) and IT Trends Study Research Team (Kappelman et al., 2022).

According to IT Trends Study Research Team (Kappelman et al., 2022), participants were asked to select, from a list of 37 technologies, up to five of their 'organization's largest/most significant current or near-future IT investments'; up to three that they consider most important to their organization and up to three that cause 'the greatest concern.' Table 1 lists the top 10 technologies. The rankings have shifted when compared from 2011 to 2021.

Table 1: IT Trends 2011-2021

Information Technologies [a]	2021 (% Selecting)	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011
n (unique organizations)	454	624	618	793	769	801	785	717	481	195	275
Cloud Computing (e.g., SaaS, PaaS, IaaS)	1 (43.0%)	1	2	3	3	4	7	5	3	2	2
Security / Cybersecurity [b]	2 (38.8%)	3	3	2	2	3	3	7	14		11
Analytics/Business Intelligence / Forecasting / Big Data [c]	3 (34.1%)	2	1	1	1	1	1	1	1	1	1
Software Development / Maintenance [d]	4 (28.6%)	4	4	4	4	2	4	4	6	11	
ERP (Enterprise Resource Planning)	5 (23.6%)	6	6	5	5	6	2	3	4	3	3
CRM (Customer Relationship Management)	6 (21.8%)	5	5	6	6	5	5	6	2	5	5
Legacy Apps: Replacing / Re-platforming [e]	7 (17.2%)	7	7	9	9	11	9	15	16		
Data Center / Infrastructure	8 (13.0%)	9	8	7	7	7	6	2			
Network / Telecommunications	8 (13.0%)	10	11	8	8	8	8	8[f]	8	12	
Collaboration Tools	10 (12.1%)	8	16	18	20	15	13	15[f]	12	4	8
Customer/Corporate Portals	10 (12.1%)	11	13	13	14	13	13	12	13	9	

[a] Blank cells, unless otherwise noted, indicate that this item was not included that year.

[b] In 2006 and 2008, this was "Security Technologies" and simply "Security" in 2010, 2011 and 2013.

[c] In 2015, "Analytics/Business Intelligence" was combined with "Data Mining" (17th in 2013, 32nd in 2014) and "Forecasting" (25th in 2013, 23rd in 2014). "Big Data" was incorporated in 2016 (10th in 2012, 5th in 2013, 9th in 2014 and 16th in 2015).

[d] In 2013, this was "Apps" and in 2012 "Application Development."

[e] In 2016, "Legacy Applications" was split into "Legacy Apps: Replacing/Re-platforming" and "Legacy Apps: Maintaining (updating /consolidation)"

[f] These values were incorrectly reported in earlier versions of this report.

Source: Kappelman et al., 2022

IT leaders indicate that the top ten most significant IT investments remained stable, with all items identified in 2020 recurring in the 2021 list. While there were minor shifts in the ranks associated with some items, these changes were relatively minor. Investments in Cloud Computing remain high (1st), and

cybersecurity increased slightly from 3rd in 2020 to 2nd in 2021, while investments in Analytics fell to third. This latter change may begin a trend as the rank of Analytics investments has fallen in the last two years. Interestingly, while Collaboration Tools fell from 8th to 10th, investments in these technologies remained above pre-COVID-19 levels. This may be due to the persistence of remote work triggered by the pandemic and hybrid workforce models implemented in many organizations (Kappelman et al., 2022).

2.3. Information and communication technology, digital entrepreneurship and the development of start-ups

Digital entrepreneurship represents a recent theoretical framework that describes and interprets the relationship between digital technologies and the entrepreneurial process (Sahut et al., 2021; Giones & Brem, 2017; Nambisan, 2017). The application of digital technologies transforms the nature of the entrepreneurial process, which is inherent in innovation, nonlinearity, complexity, experimentation, risk-taking, improvisation and effectual logic (Lindholm-Dahlstrand et al. 2019; Dunning et al. 2012; Goel & Karri 2006; Sarasvathy 2001). Due to the ubiquitous impact of digitization on all economic and social activities, Ahmad and Ribarsky (2018) refer to the multidimensional nature of the digital economy phenomenon, which crystallized a problem of clarity and a problem of scope in an attempt to embrace the concept.

A pragmatic approach that serves the purposes of statistical coverage primarily and is often present in the literature defines the digital economy as an ICT sector, including in ISIC Rev. 4. However, such a narrow approach overlooks some desirable components, such as intermediary platforms, i.e., platforms delivering intermediary or zero-priced services, and which indeed form an essential part of the digital economy activities. In this regard, Bukht and Heeks (2017) introduced a three-scope approach to understanding the digital economy, sometimes also referred to as the flexible approach (OECD, 2020: 1). The digital sector: more often called the "IT sector" or the "ICT sector" represents core element of the digital economy and currently covers ISIC industrial codes, ISIC Rev. 4, Section J, Information and communication; 2) the digital economy: includes production of digital technologies (digital sector) and also their extensive application (activities not covered by ISIC Rev. 4, such as digital services, retail activities, content activities, and also platform activities); 3) the

digitalized economy: correspond to wide range of ICT-enabled business activities and covers e-business, e-commerce (sub-set of e-business), algorithmic decision-making in business, use of digitally-automated technologies in manufacturing and agriculture including Industry 4.0, etc. Regarding the purpose of this paper, the definition brought by Bukht and Heeks (2017) will be accepted:" that part of economic output derived solely or primarily from digital technologies with a business model based on digital goods or services." This framework is broad enough and can cover all the activities of digital start-ups. Because of scalability, These leading vehicles convey digital technology's benefits to the economy and society.

The ability to scale is particularly pronounced in the digital economy (Damodaran, 2009; Autio et al., 2018; Ahmad & Ribarsky, 2018; Bukht & Heeks, 2017) due to characteristics such as lower initial business costs, significantly greater access to the market and potential customers and investors on a global scale, improved customer relationships through social media, and consequently the potential for very rapid growth (OECD/European Union, The Missing Entrepreneurs 2019; van Welsum, 2016). According to the EU Start-up Monitor (2018), five of the top seven sectors in terms of new firms in 2018 were digital sectors, which indicates that digital start-ups account for most new businesses created. Accordingly, most start-ups are in the digital sector. Digital technologies, such as artificial intelligence, digital 3D printing, social media platforms, big data, cloud technology and mobile technology, open new sources of efficiency and effectiveness of the entrepreneurial process and provide a wide range of opportunities in the modalities of entrepreneurial activities (von Briel et al., 2018). The digital business mainly implies lower start-up costs, large-scale access to markets and more accessible entrance to potential buyers and investors on a global scale, improved customer relations through social media and consequently potential to grow and scale across borders very quickly (OECD/European Union 2019; van Welsum 2016), that is, affordances to quickly scale (Autio et al. 2018; Bukht & Heeks, 2017), all of which represent the advantages of applying digital technology in business activities.

Start-up companies are part of the new trends in the economy. The impact of the development and progress of information and telecommunication technologies inevitably leads to the conclusion that intellectual capital is the most sought-after and valuable resource in these conditions. This resource brings significant changes in behavior and previous economic postulates. Globalization,

the increase in the value of time, the increase in income and the emergence of new products and services are the consequences of the development of technologies. The above changes lead to higher consumer demand for goods and services, which brings a constant need for novelty. Thanks to their innovativeness and great potential for rapid growth, start-ups are an essential source of economic growth and employment (Ivanović-Đukić et al., 2019; Steve & Dorf, 2014; Valliere & Peterson, 2009) and are in the interest of political representatives.

3. METHODOLOGICAL FRAMEWORK (RESEARCH METHODOLOGY)

The study aimed to explore the critical factors of information and communication technology that contribute to the success and sustainability of start-up companies and how these factors can be leveraged to promote their development and implementation of projects. To achieve this goal, the research employed a survey questionnaire that was methodologically structured to systematically present critical factors in the development, use, and effects of information and communication technologies in the development of start-up companies. The questionnaire provided new knowledge about the possibilities of applying digital entrepreneurship concepts, methods, and technologies.

The survey's results generated valuable information on the factors of development, use, and effects of systematically connected methods, concepts, and technologies of digital entrepreneurship in project implementation development of start-ups. The information was also helpful in realizing business goals and supporting the realization of planned business effects. All participants in the survey research were provided with detailed research results to help them gain new insights into digital entrepreneurship.

The research involved selecting a start-up company for the study and assessing how digital entrepreneurship methods, concepts, and technologies were used in project development and implementation. The interrelationship between digital entrepreneurship factors and the operations of the start-up company was also examined. The study employed theoretical and practical research methods, including literature reviews, surveys, interviews, and observations. Overall, the research sheds light on the critical role of digital entrepreneurship in start-up companies' sustainable development and resilience. Furthermore, when filling out the survey, participants were allowed to express their sugges-

tions and opinions or leave a question or fields not filled in. This ensured that the survey captured the most diverse opinions and perspectives.

Data were collected from 32 start-up companies in Croatia in the study on factors in start-up companies. Each respondent represented one start-up company. Regarding the structure of respondents, fifteen general managers of start-up companies, five founders, eight heads of departments and four IT employees participated in the survey. In terms of education level, five respondents have completed postgraduate specialist level of education, 17 respondents have a graduate level of education, five have completed undergraduate degree, and five have completed high school. Regarding the education field, 14 respondents belong to the social education field, 15 respondents belong to the technical education field, one respondent belongs to the natural science field, one respondent covers both the social and technical education fields and one respondent belongs to the artistic field of science. The key factors were identified based on the processed data, and the significant relationships between the factors were analyzed. Based on the research results, a model of the synergistic connection between information and communication technology (ICT) factors and digital entrepreneurship is created in the development of start-up companies.

In the research, a questionnaire was used to formulate and systematize questions that define and evaluate the factors of information and communication technologies (ICT) and the impact of start-ups on the economy. Tables 2 and 3 present the factors of information and communication technologies (IT) and their effects on the business of start-ups (EF), which are interrelated. The factors are identified by abbreviations (column Abb). Credit rating information about companies was collected from CompanyWall Business (2023). In the presentation of the research results, the abbreviations denote the factors as indicated in Table 2 and Table 3.

Table 2: Factors of information and communication technologies (ICT)

No.	Information and communication technologies (ICT)	Abb
1	Information security services in the Internet environment (Cyber security)	ICS
2	Business applications made to order (ordered software) according to the needs	ORS
3	Mobile applications	MOB
4	Web applications	WAP
5	Cryptocurrency mining (Crypto Mining)	CM
6	Web platform services in the cloud (Cloud Service Platform)	CSP
7	CRM system services (use of customer/supplier relationship management software)	CRM
8	ERP system services (connection to enterprise resource planning software - ERP)	ERP
9	Business intelligence	BI
10	Analysis of big data in business	BD
11	Data Mining	DM
12	Artificial Intelligence	AI
13	Virtual reality	VR
14	Augmented reality	AR
15	Blockchain technology	BCT
16	Internet of Things (IOT)	IOT
17	3D modeling and printing	3DP
18	Robotic technologies	ROB
19	Social networks	SN
20	Consulting services for work and visibility through social networks	CON
21	Services and technologies for monitoring and analyzing user experience (UX	UXS
22	Chat simulation applications (Chatbot Creator)	CSA
23	Web analytics services	ANL
24	Financial technologies and online financial services (Fintech)	FIN
25	Cryptographically protected digital asset (NFT) trading platform	NFT

Source: Authors

Table 3. Effects on the business of start-up companies

No.	Effects in business	Abb
1	Maximizing profits	PRO
2	Minimizing costs	COS
3	Higher quality product (service)	HQP
4	Identifying business opportunities in the market	BOM
5	Design and development of innovations	IND
6	Creating a sustainable competitive advantage	ADC
7	Increased ability to respond quickly and qualitatively to customer or supplier requests	RES
8	Creating a sustainable competitive ability	ABC
9	Reduced transaction time	RTT
10	Development of competences and greater possibility of job rotation	COM
11	Increased ability to partner or integrate systems with other companies	INT
12	Improved staff training	TR
13	Improved efficiency and productivity	EFF
14	Realized innovations	INR
15	Better communication and cooperation with business partners	BPC
16	Marketing/promotion/better visibility	VIS

Source: Authors

4. RESULTS OF THE RESEARCH ON THE FACTORS OF INFORMATION AND COMMUNICATION TECHNOLOGIES (ICT) AND BUSINESS EFFECTS OF START-UP COMPANIES

4.1. The meaning, ranking and identification of the critical factors of ICT in start-up companies

Table 4 shows the study's results on the importance and ranking of ICT factors in the business activities of start-up companies. The importance and ranking of the factors were calculated based on two criteria: the use of ICT from the point of view of the company's creditworthiness and the arithmetic mean of the ratings of the importance of ICT.

The significance of the difference between the arithmetic means of the ratings of companies with better and weaker credit ratings was tested at the 1% and 5% significance levels. Credit rating information about companies was collected from CompanyWall Business (2023). The ranking of ICT factors was carried out as follows. The first criterion for ranking was based on a significance level of 1%. The second criterion was the mean value of the ratings of the importance of the ICT factor. Table 4 shows that the ICT factors are distributed in positions from 1 to 5, with the importance and degree of use from the perspective of the company's credit rating at the 1% significance level. The factors were then ranked according to the mean of the ratings of the importance of the factors. Two criteria were established to determine the key factors: the criterion of the significance level (1% or 5%) and the criterion of the arithmetic mean of the scores so that the minimum score was 2.5. ICT factors that met at least one of the above criteria were identified as critical factors. The table shows that 17 key ICT factors were identified in Croatian start-up companies.

Through a comparative analysis of the study of the critical factors of ICT in start-up companies in 2023 and the Kappelman et al. study (2021), which presents the ranking of ICT factors in the business operations of companies from 2007 to 2014, eight of the nine top-ranked factors in the study by Kappelman et al. (2021) were identified in the study of ICT factors in start-up companies. These factors are 1) information security services in the Internet environment (cybersecurity), 2) web platform services in the cloud (cloud service platform), 3) CRM system services (use of customer/supplier relationship management software), 4) customized business applications according to the needs of the company, 5) business intelligence, 6) web analytics services, 7) ERP system services, and 8) enterprise Big Data analytics.

Table 4. Ranking and identifying key ICT factors in start-up companies

No.	Information and communication technologies (ICT)	Sign	Avg
1	CRM system services (use of customer/supplier relationship management software)	0,00	2,63
2	Information security services in the Internet environment (Cyber security)	0,00	3,31
3	Web platform services in the cloud (Cloud Service Platform)	0,01	3,28
4	Web analytics services	0,01	3,31
5	Web applications	0,01	4,06
6	Mobile applications	0,08	3,59
7	Social networks	0,03	3,38
8	Business applications made to order according to the needs of the company	0,66	3,34
9	Consulting services for work and visibility through social networks	0,47	3,03
10	Services and technologies for monitoring and analyzing user experience (UX Service)	0,19	2,63
11	Internet of Things (IOT)	0,08	2,56
12	Financial technologies and online financial services (Fintech)	0,04	2,38
13	Business intelligence	0,05	2,38
14	Artificial Intelligence	0,02	2,19
15	Analysis of big data in business	0,04	2,09
16	3D modeling and printing	0,05	2,06
17	ERP system services (connection to enterprise resource planning software - ERP)	0,02	1,97
18	Data Mining	0,09	2,00
19	Blockchain technology	0,36	1,88
20	Virtual reality	0,75	1,56
21	Robotic technologies	0,14	1,47
22	Chat simulation applications (Chatbot Creator)	0,20	1,44
23	Augmented reality	0,27	1,44
24	Cryptographically protected digital asset (NFT) trading platform	0,94	1,34
25	Cryptocurrency mining (Crypto Mining)	0,94	1,34

Source: Authors

4.2. Systematic analysis and correlation of information and communication technology (ICT) factors in the digitalization of start-up companies

A systematic analysis defines the factors of information and communication technologies (ICT) in developing start-up companies and realizing projects. By methodically structuring and linking information and communication technologies (ICT) factors and their impact on the business of start-up companies, new knowledge can be gained about the possibilities of applying concepts, methods and technologies in the development of start-up companies. Systematic analysis and identification of critical factors of information and communication technologies (ICT) create the basis for building a methodological framework for the strategic development of informatization of start-up companies and other

organizations (small and medium-sized companies, large companies and corporations ...).

A comparative analysis of the study on the critical factors of ICT in start-up companies in 2023 and the study by Kappelman et al. (2021), which presents the ranking of ICT factors in the business activities of companies in the period from 2007 to 2014, shows that there is a high degree of correspondence of the critical factors of ICT in business, which may seem unusual considering that the comparative analysis refers to two periods. The correspondence can be explained in two ways. Table 1 shows the research results according to the study by Derksen and Luftman (2015). The top-ranked factors retain their positions. For example, the analytics and business intelligence factors were ranked in one of the top two positions throughout the study period from 2007 to 2014.

Another determinant that explains the sustainability of the same information and communication technologies in high positions is the importance of the development and the nature of integrating information and communication technologies. Rüßmann and Sur (2015) state the problem of incomplete integration of the information system in the digitization of the business system. The basic assumption for the success of the information system and the business system is the integration based on the systematic development and use of information technologies, which should enable the integration of business activities and processes both within the business system and the company with the business environment, where it happens that the organization, suppliers and users are poorly connected. Systematic development and use of information technologies should enable high-quality connections of start-up companies with customers and suppliers and all relevant business environment factors.

The critical factor of qualitative information linkage and integration of the components of the information system within the company and the company with the environment is the systematic and connected use of ICT factors in the context of the business system's needs. In this context, it is necessary to identify the key ICT factors and study how to use the identified ICT. As part of the research, the correlations and the significance of the correlations between the ICTs defined as key in start-up companies were calculated. Its connection with other IT technologies can determine how a particular ICT is used.

Table 5 shows the calculated values of the correlations and the significance of the correlations between the ICT factors in start-up companies. Correlations

at the 5% level of statistical significance are underlined, and correlations at the 1% significance level are in bold. Values greater than 0.6 according to the scale are defined as highly significant correlations and are indicated by bold print and underlining.

Table 5. Values of correlations and the meaning of correlations between ICT factors in start-up companies

ICT		ICS	ORS	MOB	WAP	CSP	CRM	ERP	BI	BD	DM	AI	IOT	3DP	SN	CON	UXS	ANL	FIN
ICS	Corr.	1,00	0,10	0,23	0,56	0,61	0,57	0,50	0,35	0,32	0,20	0,30	0,32	0,32	0,55	0,43	0,42	0,68	0,36
	Sig.	0,00	0,58	0,20	0,00	0,00	0,00	0,00	0,05	0,07	0,26	0,10	0,08	0,07	0,00	0,01	0,02	0,00	0,04
ORS	Corr.	0,10	1,00	0,21	0,11	0,10	0,10	0,21	0,35	0,20	0,22	0,32	0,38	-0,11	-0,17	0,05	0,07	0,23	0,11
	Sig.	0,58	0,00	0,25	0,54	0,59	0,58	0,26	0,05	0,28	0,24	0,07	0,03	0,96	0,96	0,78	0,71	0,20	0,55
MOB	Corr.	0,23	0,21	1,00	0,39	0,62	0,40	0,25	0,35	0,44	0,33	0,38	0,51	0,04	0,38	0,06	0,00	0,03	0,53
	Sig.	0,20	0,25	0,00	0,03	0,00	0,02	0,17	0,05	0,01	0,06	0,03	0,00	0,82	0,03	0,76	0,99	0,86	0,00
WAP	Corr.	0,56	0,11	0,39	1,00	0,38	0,25	0,33		0,20	0,06	0,20	0,31	0,29	0,51	0,38	0,41	0,55	0,30
	Sig.	0,00	0,54	0,03	0,00	0,03	0,16	0,06	1,00	0,27	0,76	0,27	0,09	0,11	0,00	0,03	0,02	0,00	0,09
CSP	Corr.	0,61	0,10	0,62	0,38	1,00	0,60	0,29	0,52	0,58	0,48	0,38	0,42	0,19	0,52	0,32	0,31	0,32	0,61
	Sig.	0,00	0,59	0,00	0,03	0,00	0,00	0,10	0,00	0,00	0,01	0,03	0,02	0,29	0,00	0,08	0,08	0,07	0,00
CRM	Corr.	0,57	0,10	0,40	0,25	0,60	1,00	0,58	0,47	0,47	0,42	0,51	0,39	0,30	0,44	0,16	0,25	0,39	0,48
	Sig.	0,00	0,58	0,02	0,16	0,00	0,00	0,00	0,01	0,01	0,02	0,00	0,03	0,10	0,01	0,39	0,16	0,03	0,01
ERP	Corr.	0,50	0,21	0,25	0,33	0,29	0,58	1,00	0,36	0,36	0,27	0,44	0,52	0,44	0,28	0,34	0,30	0,29	0,27
	Sig.	0,00	0,26	0,17	0,06	0,10	0,00	0,00	0,05	0,04	0,14	0,01	0,00	0,01	0,12	0,06	0,09	0,11	0,14
BI	Corr.	0,35	0,35	0,35	0,07	0,52	0,47	0,36	1,00	0,79	0,67	0,48	0,54	0,27	0,35	0,21	0,33	0,43	0,74
	Sig.	0,05	0,05	0,05	0,72	0,00	0,01	0,05	0,00	0,00	0,00	0,01	0,00	0,14	0,05	0,24	0,07	0,01	0,00
BD	Corr.	0,32	0,20	0,44	0,20	0,58	0,47	0,36	0,79	1,00	0,88	0,53	0,51	0,19	0,43	0,32	0,54	0,49	0,83
	Sig.	0,07	0,28	0,01	0,27	0,00	0,01	0,04	0,00	0,00	0,00	0,00	0,00	0,29	0,01	0,07	0,00	0,00	0,00
DM	Corr.	0,20	0,22	0,33	0,06	0,48	0,42	0,27	0,67	0,88	1,00	0,60	0,44	0,16	0,32	0,31	0,36	0,40	0,69
	Sig.	0,26	0,24	0,06	0,76	0,01	0,02	0,14	0,00	0,00	0,00	0,00	0,01	0,39	0,07	0,08	0,04	0,02	0,00
AI	Corr.	0,30	0,32	0,38	0,20	0,38	0,51	0,44	0,48	0,53	0,60	1,00	0,54	0,02	0,07	0,00	0,05	0,15	0,38
	Sig.	0,10	0,07	0,03	0,27	0,03	0,00	0,01	0,01	0,00	0,00	0,00	0,00	0,91	0,71	0,96	0,77	0,41	0,03
IOT	Corr.	0,32	0,38	0,51	0,31	0,42	0,39	0,52	0,54	0,51	0,44	0,54	1,00	0,47	0,36	0,29	0,14	0,17	0,57
	Sig.	0,08	0,03	0,00	0,09	0,02	0,03	0,00	0,00	0,00	0,01	0,00	0,00	0,01	0,04	0,10	0,44	0,34	0,00
3DP	Corr.	0,32	-0,11	0,04	0,29	0,19	0,30	0,44	0,27	0,19	0,16	0,02	0,47	1,00	0,46	0,49	0,24	0,32	0,25
	Sig.	0,07	0,96	0,82	0,11	0,29	0,10	0,01	0,14	0,29	0,39	0,91	0,00	0,00	0,01	0,00	0,18	0,07	0,17
SN	Corr.	0,55	-0,17	0,38	0,51	0,52	0,44	0,28	0,35	0,43	0,32	0,07	0,36	0,46	1,00	0,46	0,38	0,51	0,60
	Sig.	0,00	0,96	0,03	0,00	0,00	0,01	0,12	0,05	0,01	0,07	0,71	0,04	0,01	0,00	0,01	0,03	0,00	0,00
CON	Corr.	0,43	0,05	0,06	0,38	0,32	0,16	0,34	0,21	0,32	0,31	0,00	0,29	0,49	0,46	1,00	0,66	0,49	0,33
	Sig.	0,01	0,78	0,76	0,03	0,08	0,39	0,06	0,24	0,07	0,08	0,96	0,10	0,00	0,01	0,00	0,00	0,00	0,07
UXS	Corr.	0,42	0,07	0,00	0,41	0,31	0,25	0,30	0,33	0,54	0,36	0,05	0,14	0,24	0,38	0,66	1,00	0,70	0,42
	Sig.	0,02	0,71	0,99	0,02	0,08	0,16	0,09	0,07	0,00	0,04	0,77	0,44	0,18	0,03	0,00	0,00	0,00	0,02
ANL	Corr.	0,68	0,23	0,03	0,55	0,32	0,39	0,29	0,43	0,49	0,40	0,15	0,17	0,32	0,51	0,49	0,70	1,00	0,51
	Sig.	0,00	0,20	0,86	0,00	0,07	0,03	0,11	0,01	0,00	0,02	0,41	0,34	0,07	0,00	0,00	0,00	0,00	0,00
FIN	Corr.	0,36	0,11	0,53	0,30	0,61	0,48	0,27	0,74	0,83	0,69	0,38	0,57	0,25	0,60	0,33	0,42	0,51	1,00
	Sig.	0,04	0,55	0,00	0,09	0,00	0,01	0,14	0,00	0,00	0,00	0,03	0,00	0,17	0,00	0,07	0,02	0,00	0,00

Source: Authors

In the analysis of correlations and their significance and in the context of the use of ICT factors, correlations at the 1% significance level and highly significant correlations (greater than 0.5) are analyzed using the example of business intel-

ligence. It can be seen in the table that there are correlations between business intelligence and the factors cloud service platform, CRM system service, artificial intelligence and web analytics services at the statistical significance level of 1%. This suggests that business intelligence is part of the CRM application via a cloud platform. There is also a very significant relationship between business intelligence and the factors of Big data analytics, data mining, financial technologies, and online financial services in enterprises. From the above data, it can be concluded that business Intelligence is used significantly in the framework, i.e., as part of CRM applications. The high correlation between data mining and business intelligence indicates that the respondents did not perceive data mining as a stand-alone technology but a part of business intelligence. The analysis of the correlations shows that start-up companies develop and use business intelligence and artificial intelligence synergistically, and artificial intelligence can be used as part of business intelligence.

4.3. Correlation analysis of the ICT factors and the effects of business activities of start-up companies

Table 6 shows the correlations between the factors of information and communication technologies and the effects of the business activities of start-up companies.

Table 6. Correlations between ICT and business performance of start-up companies

Effects	Corr. and Sig.	ICS	ORS	MOB	CSP	CRM	ERP	BI	BD	DM	ANL	FIN
PRO	Correlation	0,13	0,29	0,26	0,29	0,15	0,10	**0,45**	0,21	0,11	0,07	0,18
	Sig. (2-tailed)	0,49	0,11	0,15	0,11	0,41	0,60	*0,01*	0,25	0,54	0,72	0,33
COS	Correlation	0,17	0,17	0,22	0,26	0,34	0,31	0,40	0,19	0,19	0,06	0,26
	Sig. (2-tailed)	0,34	0,34	0,22	0,15	0,05	0,09	*0,02*	0,31	0,30	0,73	0,14
HQP	Correlation	0,02	0,28	0,06	-0,12	0,02	0,11	0,27	0,13	0,02	0,25	0,11
	Sig. (2-tailed)	0,92	0,12	0,74	0,96	0,93	0,55	0,14	0,49	0,90	0,17	0,54
BOM	Correlation	0,22	0,05	0,35	0,37	0,35	0,31	0,38	0,29	0,19	0,09	0,32
	Sig. (2-tailed)	0,22	0,80	0,05	*0,04*	0,05	0,08	*0,03*	0,10	0,29	0,63	0,07
IND	Correlation	0,27	0,21	-0,04	0,14	0,20	0,18	0,32	0,19	0,06	0,36	0,18
	Sig. (2-tailed)	0,14	0,24	0,96	0,45	0,27	0,34	0,07	0,29	0,76	*0,04*	0,32
ADC	Correlation	0,10	0,23	**0,45**	0,42	0,27	0,09	**0,49**	0,35	0,25	-0,03	0,42
	Sig. (2-tailed)	0,57	0,21	*0,01*	*0,02*	0,13	0,62	*0,00*	0,05	0,17	0,96	*0,02*
RES	Correlation	0,01	0,44	0,24	0,31	-0,02	-0,07	0,36	0,33	0,23	0,19	0,33
	Sig. (2-tailed)	0,98	*0,01*	0,19	0,08	0,96	0,96	*0,04*	0,07	0,20	0,30	0,07
ABC	Correlation	-0,03	0,16	0,39	0,36	0,17	0,03	0,42	0,36	0,28	-0,07	0,40
	Sig. (2-tailed)	0,96	0,37	*0,03*	*0,04*	0,34	0,87	*0,02*	*0,04*	0,12	0,96	*0,02*
INT	Correlation	0,13	0,11	**0,46**	0,40	0,12	-0,04	**0,57**	0,39	0,30	0,04	0,45
	Sig. (2-tailed)	0,46	0,55	*0,01*	*0,02*	0,52	0,96	*0,00*	*0,03*	0,10	0,83	*0,01*
INR	Correlation	0,40	0,12	0,33	0,26	0,28	0,44	**0,46**	0,25	0,15	0,13	0,20
	Sig. (2-tailed)	*0,02*	0,51	0,06	0,14	0,11	*0,01*	*0,01*	0,17	0,42	0,49	0,27
BPC	Correlation	0,30	0,38	0,05	0,06	-0,03	0,20	0,27	0,13	0,02	0,30	-0,02
	Sig. (2-tailed)	0,09	*0,03*	0,80	0,72	0,96	0,28	0,13	0,47	0,93	0,09	0,96
VIS	Correlation	0,09	0,11	0,32	0,33	0,29	0,17	0,35	0,23	0,28	-0,05	0,29
	Sig. (2-tailed)	0,63	0,55	0,08	0,06	0,11	0,35	*0,05*	0,21	0,12	0,96	0,11

Source: Authors

In the table, Pearson correlation coefficients and the significance of correlation were calculated in Visual Basic for Excel and checked with SPSS. Italic letters indicate the significance of correlations at the 5% level, and italic and underlined letters indicate significance at the 1% level. The columns indicate the ordinal numbers of the information and communication technologies factors shown in Table 2, and the rows indicate the ordinal numbers of the effects in start-up companies, which are also shown in Table 3.

The table shows the dominant influence of business intelligence factors on the effects of start-up companies. The correlation of business intelligence on profit maximization is particularly significant at the 1% significance level. In addition, business intelligence significantly impacts creating a sustainable competitive advantage, increased ability to partner with other companies or inte-

grate systems, and innovation achieved at the 1% significance level. Based on this research, it can be concluded that business intelligence is a critical factor in the achievement of results in the operations of start-up companies. The factor of mobile applications and the factor of web platform services in the cloud have a very significant impact on the business. From the data in Table 6, the mobile applications (MOB) and cloud platform services (CSP) factors significantly impact identifying business opportunities in the market, creating sustainable competitiveness, and the ability to partner or integrate systems with other companies.

A very significant correlation between the ICT factor and the creation of a sustainable competitive advantage (ADC), the ability to enter into partnerships with other companies or integrate systems (INT), and the innovation achieved (INR) is also apparent. The mobile applications and business intelligence factors impact the creation of a sustainable competitive advantage at the 1% significance level, and the cloud web platform services and financial technologies factors at the 5% significance level. The ability to partner or integrate systems with other companies significantly impacts the mobile applications, business intelligence, financial technologies and online financial services factors at the 1% significance level. Information security factors in the Internet environment (cybersecurity), connection to enterprise resource planning software - ERP and business intelligence have a significant impact on the realized innovations of start-up companies.

By linking the table of correlations within (between) the factors of information technologies with this table (table 6), in which the correlations between information technologies and effects on the business activity of start-up companies are calculated, indirect correlations can also be studied. For example, for the artificial intelligence factor (AI), no single significant direct correlation was calculated with the effects on business. Table 5 calculates the correlation between artificial intelligence (AI) and business intelligence (BI) at the 1% significance level. Because the significant influence of business intelligence on several effects in the business operations of established companies was previously found, it can be concluded that artificial intelligence in synergy with business intelligence or as a part of business intelligence can have an indirect but also significant influence on the effects in the business operations of start-up companies.

5. DISCUSSION AND CONCLUSION

The critical factor for the quality of the information connection and the integration of the components of the information system within the company and the company with the environment is the systematic and connected use of ICT factors in the context of the business system's needs. In this context, the most important ICT factors in start-up companies were identified, the relationships between the ICT factors were examined, and the correlation between the ICT factors and the business effects of start-up companies was studied.

The hypothesis was proven that the systematic development and synergistic connection of the information and communication technologies factors significantly correlate with the realization of business results in Croatian start-up companies. Through systematic analysis and identification of critical factors of information and communication technologies (ICT), correlations between factors of information and communication technologies in start-up companies were identified, and significant correlations between ICT factors and effects on the business activity of start-up companies were determined.

Based on the results of the correlations presented in Table 5 and Table 6, it can be seen that there are significant correlations between the ICT factors and between the ICT factors and business effects in start-up companies. Future work should investigate the possibilities of developing and using new combinations of technologies to achieve business effects in start-up companies.

One of the significant limitations of the paper is the sample size. The research was conducted on a sample of 32 start-up companies, which is a small sample and significantly affects the generalization of the research results. In order to increase the generalizability of the findings, future research should encompass a significantly more significant number of start-ups and a more diverse sample, e.g., in terms of activity and geographic dispersion. Furthermore, to explain start-up growth and development from a broader perspective, it is recommended that future studies consider the determinants of the functionality and vitality of the entrepreneurial ecosystem in which start-ups operate—for example, government policy, the university community, private capital market, culture and others.

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Slavomir Vukmirović • Mirjana Grčić Fabić • Antonia Džido: ANALYSIS OF THE FACTORS OF INFORMATIZATION AND DIGITAL ENTREPRENEURSHIP...

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ONLINE SHOPPING DETERMINANTS OF CROATIAN CONSUMERS

Ivan PRUDKY, mag.oec.
University of Rijeka, Faculty of Economics and Business

E-mail: ivan.prudky@efri.hr

Nenad VRETENAR, Ph.D.
University of Rijeka, Faculty of Economics and Business

E-mail: nenad.vretenar@efri.hr

Jelena JARDAS ANTONIĆ, Ph.D.
University of Rijeka, Faculty of Economics and Business

E-mail: jelena.jardas.antonic@efri.hr

Abstract

Understanding consumer behavior is one of the focal points of decision theory. Over the past decade, a substantial increase in the popularity of online shopping has been observed worldwide. The significant acceleration of this trend can be attributed to the COVID-19 pandemic, which affected consumers' traditional shopping behavior and forced them to shop without visiting physical stores. The increasing popularity of online shopping necessitated a better understanding of the factors driving behavior. In this research, based on a sample of 394 respondents, we aimed to find influential socio-demographic factors that affect online shopping habits and decision-making. To this end, we constructed a binary logistic regression model to estimate the influence of socioeconomic factors on online purchasing decisions. To support the logistic regression model results, we examined significant differences in views on online shopping among socio-demographic subgroups. Statistically significant influences on online shopping decisions include a person's age, education level, and employment status. Gender and urbanization level of residence showed no influence on online shopping behavior.

1. INTRODUCTION

The digital transformation of the economy and society is increasingly prominent. Comparing data from the last ten years, the number of households with Internet access in the EU has increased by 20 percentage points (PP). Internet services are no longer used only for communication or entertainment purposes but also for accessing information, civic and political action, health information, e-learning, and e-commerce services (Eurostat, 2022a). The EU has recognized and plans to take advantage of the development trends of the ICT industry and its impact on all areas of society and the economy. Therefore, the EU has set up a plan for the Digital Decade goals to promote the development of society by improving ICT infrastructure, skills, public services, and business opportunities (Eurostat, 2022b). Companies have recognized the share and frequency of e-commerce use by individuals and, to strengthen their market position, offer them to purchase their products and services through physical and online channels. Over the last decade, an increase in the private purchase of goods and services via the Internet by individuals of all ages is noticeable (over 20 PP of increase when comparing the values in 2012 and 2022). General trends observed within EU member states are a positive correlation between education level and employment status with the use of e-commerce, a significant increase in the use of e-commerce services by specific age groups, a significant increase in the use of e-commerce services when purchasing certain product groups and the service, and a significant difference in the use of the e-commerce service to obtain goods and services (Eurostat, 2023a).

From the perspective of the collaborative economy, Croatia is at a relatively low level of online purchases among the EU-27 member states (Eurostat, 2023b). Although the volume of private online purchases at the level of individuals is lower than the EU-27 average, exponential growth can be observed if we look at the movements of online products and services by individuals in Croatia. In 2012, this was done by 23.08% of private individuals within 12 months. In 2017, this figure was 28.78%, and in 2022 it reached 56.15% of individuals who provided online products or services within 12 months (Eurostat, 2023c;

Eurostat, 2023d). The significant increase in e-commerce services by individuals in the Republic of Croatia to obtain goods and services opens a considerable market potential that companies must exploit. Knowledge of purchasing habits, preferences and behavioral patterns is essential for exploiting the newly created market potential. Identifying the socio-demographic characteristics of consumers who buy products and services online is critical to identifying a market niche. Recognizing and understanding the market niche provides more precise insights into behavioral patterns and the possibility of influencing consumers to choose your company's products and services when shopping online.

As the relative share of the Croatian population with experience in online shopping is growing but still comparably lagging within the EU-27, understanding their preferences and patterns is essential for decision theory and market participants' operations management and marketing efforts. This research aims to understand Croatian customers' decision-making when shopping online. Our main aim is to analyze and give insight into the critical demographic determinants that shape Croatian consumers' online shopping preferences, i.e., the influence of consumers' gender, age, attained education level, employment status, and urbanization level of consumers' residence on their online shopping decision-making.

2. LITERATURE REVIEW

The idea that consumer demographic characteristics could help understand and explain their online shopping behavior is not new and has already been tested in scientific research. *Gender* differences are among the most studied. A study by Yahya and Sugiyanto (2020) showed that women were likelier to shop online than men. Similar results and conclusions are found in other work (Moon et al., 2021; Hood et al., 2020), while Truong and Truong (2022) found that the gender difference is reflected in women spending more money online. Recent research by Vretenar et al. (2023) shows that women are more likely to shop online for certain types of products, such as clothing and shoes, which is consistent with the conclusions of Boustany (2022). Kim et al.'s (2020) research point to gender differences in shopping mode choices.

The following demographic difference we expected to influence shopping behavior is *age*. Again, previous research by Moon et al. (2021) and Hood et al. (2020) has shown that age is a relevant factor in understanding shopping

decisions, as their research found that younger shoppers are more likely to shop online. Buhaljoti (2022) et al. concluded that consumers are more likely to shop online up to age 30, while the likelihood decreases. Consistent with these conclusions are research findings (Audrain-Pontevia & Vanhuele, 2016; Rummo et al., 2022) showing that older people are more likely to shop in stores. Truong and Truong (2022) concluded that older consumers spend more time shopping online than younger consumers, while Giannakopoulou et al. (2022) found that younger consumers are more likely to purchase groceries online.

Employment status is a variable that could be intuitively associated with purchase decisions, and some research confirms this. Frank and Peschel (2020) found that married people with children are more likely to shop online to save time, which is consistent with the findings of other studies of European working consumers (López Soler et al., 2021; and Smith et al., 2022). However, no connection between shopping patterns and employment status was found in research by Pattanaik, Mishra and Moharana (2017), and education level also had no influence. The influence of a consumer's attained *education level* on shopping behavior was somewhat doubtful. İlhan and İşçioğlu (2015) found that consumers with higher education were more likely to buy groceries online, which was also confirmed in a Belgian sample in a study by Dominici et al. (2021). Van Droogenbroeck et al. (2017) concluded that educated consumers are more likely to prefer online purchases. However, Troung and Troung (2022) found that educated consumers spend less on online purchases. Consumer's *urbanization level of residence* influence was least explored or commonly grouped with other influencing factors while the shopping decision-making process was analyzed. Although it could be argued that people living away from major urban centers are more inclined to shop online, research mainly supports the opposite, with some studies (Abdul Hussein et al., 2020; Hood et al., 2020) associating living in urban areas with a higher likelihood of shopping online. However, the latter study (Hood et al., 2020) indicated that consumers outside urban areas shop more online.

Based on the review of relevant literature on potential influencing socio-demographic factors, we have constructed five hypotheses regarding factors influencing consumers' online shopping behavior (model visualization in Figure 1):
H1: Gender significantly affects a consumer's decision to shop online.
H2: Age significantly affects a consumer's decision to shop online.
H3: Employment status significantly affects a consumer's decision to shop online.
H4: Attained education level significantly affects a consumer's decision to shop online.

H5: Urbanisation level of residence significantly affects a consumer's decision to shop online.

Figure 1. Online shopping decisions' socio-demographic influences
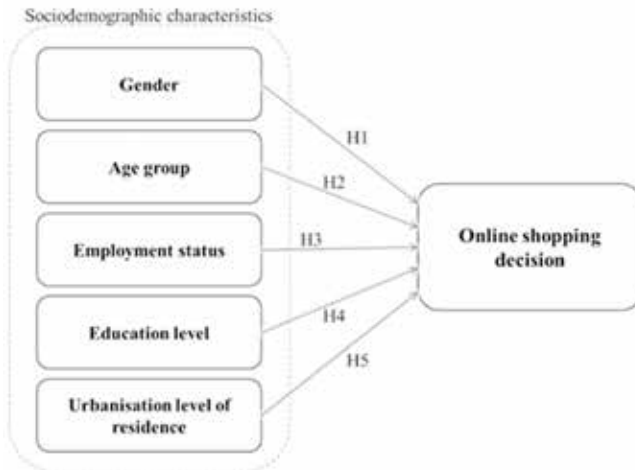
Source: authors' construction

To examine the set hypotheses of our research, we used a logistic regression model since the proposed dependent variable is classified as a binary one, and the independent variables take the form of binary or categorical values (Sreejesh et al., 2013; Harrell, 2015; Wilson & Lorenz, 2015). Logistic regression models have proven to be a helpful analysis method as it has been used in several relevant studies examining consumer shopping behavior (Vohra & Soni, 2015; Serener, 2016; Beckers et al., 2018; Bryła, 2018).

3. SAMPLE, DATA AND METHODOLOGY

Survey questionnaires regarding in-store and online shopping habits and decision-making were constructed using Google Forms and distributed online from May to September 2022. The socio-demographic characteristics of the respondents, together with the model variable operationalization, are presented in Table 1. Most respondents were female (72.3%), with almost half of the respondents falling within the 31-50 age range. One-quarter of the respondents are not employed (unemployed or retired), and the rest are employed pupils and students, private or public sector employees or self-employed. The lowest share

of respondents has a lower education level (7.1%), while most have attained a high school level (44.4%). 64.7% of respondents reside in cities with over 20000 residents. A total of 394 respondents represent the sample of research. Descriptive statistics of the sample are given in Table 2. More than 90% of respondents in the sample have previous experience in online shopping (OS: 0 = no, 1 = yes).

Table 1. Socio-demographic characteristics of respondents and model variables operationalization

Socio-demographic characteristic	Model variable operationalization	Frequency	(%)
Gender	GEN		
Male	0	109	(27.7)
Female	1	285	(72.3)
Age group	AG		
<31 years	1	137	(34.8)
31-50 years	2	196	(49.7)
>50 years	3	61	(15.5)
Employment status	ES		
Not employed	1	98	(24.9)
Employed	2	296	(75.1)
Education level	EDU		
Lower education	1	28	(7.1)
High school education	2	175	(44.4)
Bachelor education	3	59	(15.0)
University master education or higher	4	132	(33.5)
Urbanization level of the residence	URB		
Municipality with 0-10000 residents	1	77	(19.6)
Municipality/city with 10001-20000 residents	2	62	(15.7)
The city with 20001+ residents	3	255	(64.7)

Source: authors' calculation

Table 2. Sample descriptive statistics

Variable	Mean	Std. dev.	Min.	Max.
OS	0.9010	0.2990	0	1
GEN	0.7234	0.4479	0	1
AG	1.8071	0.6830	1	3
ES	1.7513	0.4328	1	2
EDU	2.7487	1.0014	1	4
URB	2.4518	0.8001	1	3
N = 394				

Source: authors' calculation

Aiming to find evidence of socio-demographic factors influencing one's decision to shop online, a binary logistic regression model (Sreejesh et al., 2013; Harrell, 2015; Wilson & Lorenz, 2015) with the dependent variable previous online shopping experience (OS) was constructed:

$$OS = log\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 GEN + \beta_2 AG + \beta_3 EDU + \beta_4 ES + \beta_5 URB + e \ . \tag{1}$$

The unstandardized beta coefficients determine the movement of the value of the dependent variable. Exponentiated coefficients will show the odds ratios of change of the dependent variable:

$$Odds(OS) = \frac{p}{1-p} = e^{\beta_0 + \beta_1 GEN + \beta_2 AG + \beta_3 EDU + \beta_4 ES + \beta_5 URB} \ . \tag{2}$$

Furthermore, respondents were to evaluate online shopping characteristics and their reasoning for online purchases with the help of a Likert scale measurement. Mann-Whitney U and Kruskal Wallis H tests, followed by Dunn's post hoc pairwise comparison tests (adjusted using Bonferroni's error correction), were conducted to prove significant differences in online shopping determinant evaluation regarding the socio-demographic subgroups (Conroy, 2012; Dinno, 2015; Harris & Hardin, 2013). The differences were used to explain the reason behind established socio-demographic influences on online purchase decisions based on the logistic regression model. To conduct the analysis, STATA 17.0 MP-Parallel Edition was used.

4. EMPIRICAL RESULTS

Based on the log-likelihood ratio test statistics, the five-predictor model provides a better fit than the null hypothesis, where only the model's constant was included. Post-estimation Hosmer–Lemeshow ($\chi 2(8) = 7.64$, $p > \chi 2 = 0.4695$) and Pearson ($\chi 2(77) = 40.28$, $p > \chi 2 = 0.9998$) test values are non-significant, indicating a good logistic regression model fit (Hosmer & Lemeshow, 2000; Tabachnick & Fidell, 2019). The value of McFadden's pseudo R2 (R2 = 0.412), as well as Cragg & Uhler's (Nagelkerke) (R2 = 0.491), indicate an excellent model fit (Hensher & Stopher, 1979; Cragg & Uhler, 1970). The results of the binary logistic regression model are presented in Table 3.

Table 3. Results of the logistic regression

	ß	exp(ß)	se exp(ß)	P>z	95% C.i. for exp(ß)	
					lower	upper
Gender						
Female	-0.4087	0.6645	0.3304	0.441	0.2508	1.7607
Age group						
31-50 years	-3.0605	0.0469	0.0502	0.004***	0.0057	0.3832
>50 years	-4.5531	0.0105	0.0116	0.000***	0.0012	0.0907
Education level						
High school education	1.8259	6.2085	3.7584	0.003***	1.8954	20.3364
Bachelor education	3.1639	23.6638	22.0289	0.001***	3.8168	146.7154
University master education or higher	3.7099	40.8502	31.3720	0.000***	9.0676	184.0336
Employment status						
Employed	1.0907	2.9763	1.4564	0.026**	1.1407	7.7657
Urbanization level of the residence						
Municipality/city with 10001-20000 residents	-0.1062	0.8993	0.7838	0.933	0.1604	5.3686
The city with 20001+ residents	-0.3122	0.7319	0.4543	0.861	0.2507	3.1772
Constant	2.9901	19.8868	23.8785	0.013	1.8902	209.2279
LR $\chi^2(9)$	104.91					
Prob > χ^2	0.0000					
Pseudo R2	0.4124					
* p<0.1. ** p<0.05. *** p<0.01						

Source: authors' calculation

Our results show that consumers' gender and urbanization level of residence does not influence online shopping decision. At the same time, the age group attained education level and employment status were significantly influenced. An increase in age negatively affects the likelihood of shopping online. The odds of people aged 31-50 shopping online are 0.047 times higher than those aged 30 years or under. The odds of someone over 50 shopping online are 0.011 times higher than those aged 30 years or under. The increase in attained education level positively impacts the likelihood of shopping online. The odds of a person with a high school education shopping online are 6.209 times higher than those with lower education. The odds of someone with a bachelor's education shopping online are 23.664 times higher than those with lower education. The odds of a person with a university master's or higher education shopping online are 40.850 times higher than those with a lower education level. Some conclusions of employment status influence on the likelihood of online shopping can be deduced. Employment status positively affects the probability of shopping online,

as an employed person's odds of shopping online are 2.976 times higher than those of an unemployed person.

The constructed logistic regression model gave an overall correct classification rate of 93.15%, with a sensitivity of 97.75% and a specificity of 51.28%. A detailed classification matrix is presented in Table 4, with the correctly classified "yes" and "no" answers regarding prior online shopping experience being higher than the incorrectly classified values.

Table 4. Classification matrix

Classified	Yes	No	Total
Yes	347	19	366
No	8	20	28
Total	355	39	394

Source: authors' calculation

Respondents who shopped online (N = 355) evaluated, using a Likert scale measurement (1 = strongly disagree – 5 = strongly agree), statements regarding online shopping decision-making determinants (Figure 2). Respondents agreed that online shopping is safe, saves time and that it offers better deals. Further, they agree that online shopping is preferable due to the available information and somewhat lesser because of the ease of access to reviews. Respondents disagree that online shopping does not meet their expectations and that they lack the literacy to engage in online shopping. Long delivery time makes it not unpreferred to shop online, and slightly deeper concerns are differences in a product compared to what is advertised and other possibilities of fraud.

Figure 2. Online shopping decision-making determinants
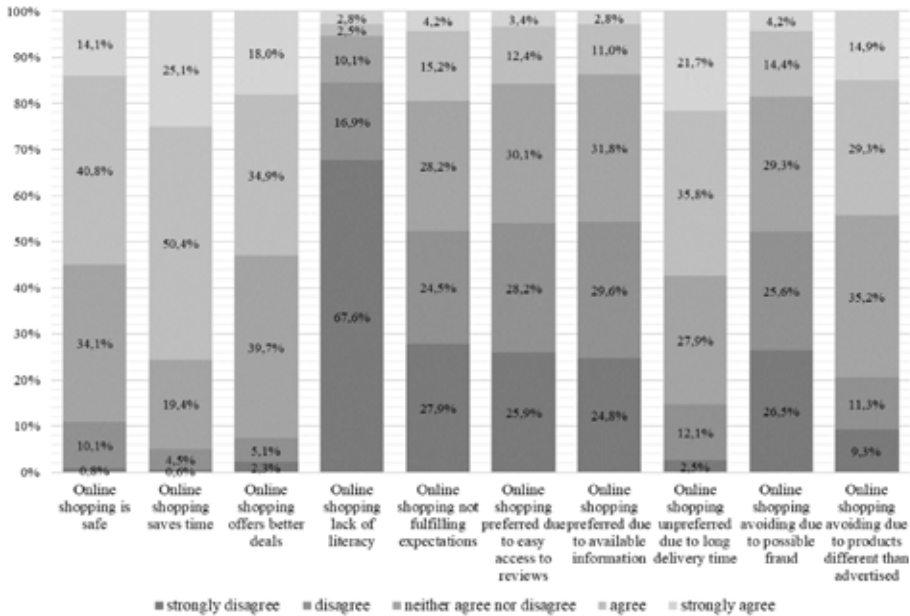
Observing values describing online shopping activities according to the defined age groups, the Kruskal Wallis H test provided evidence of significant differences between the groups in several statements. Separate age groups shared different views regarding online shopping's offering of better deals ($\chi2(2) = 6.592$, $p = 0.037$), availability of information ($\chi2(2) = 6.056$, $p = 0.048$), ease of access to reviews ($\chi2(2) = 15.923$, $p = 0.000$), level of fulfillment of expectations ($\chi2(2) = 10.154$, $p = 0.006$), the possibility of fraud ($\chi2(2) = 10.926$, $p = 0.004$) and the lack of literacy in online shopping ($\chi2(2) = 27.066$, $p = 0.000$). The subgroup's specifics substantiate the reasoning behind the decrease in the likelihood of shopping online with the increase in age. The older shoppers disagree that online shopping offers better deals ($M = 2.13$), gives better information ($M = 2.11$) or access to reviews ($M = 1.80$). Although they disagree with the lack of literacy in online shopping ($M = 1.48$), other age groups disagree more with that statement. They are the least keen to avoid online shopping because of possible fraud ($M = 1.87$). Surprisingly, this group disagrees the most about online shopping not fulfilling their expectations ($M = 1.80$). The youngest group agrees most with getting better deals while shopping online ($M = 3.72$), better information ($M = 3.67$) and easier access to reviews ($M = $

3.53). People aged 31-50 have avoided online shopping due to possible fraud the most (M = 2.70) and state the slightest lack of literacy in online shopping (M = 1.39).

Differences in online shopping perceptions were evident regarding respondents' employment status, as determined using the Mann-Whitney U tests. Groups showed significant differences in their assessment of online shopping's level of fulfillment of expectations ($z = -2.782$, $p = 0.005$), delivery time ($z = -3.404$, $p = 0.001$), product difference to advertising ($z = -2.837$, $p = 0.005$), the possibility of fraud ($z = -3.129$, $p = 0.002$) and their lack of online shopping literacy ($z = -3.829$, $p = 0.000$). A higher level of distrust, noted among not employed subsample, in online shopping differentiates the behavior of the two compared groups. Respondents from the not employed subsample group showed a higher perception of the lack of online shopping literacy (M = 1.97) than those employed (M = 1.45). They said to agree more to not preferring online shopping because of extended delivery times (M = 2.76), products being different than advertised (M = 2.78), and fear of other possibilities of fraud (M = 2.84), compared to the employed respondents (M = 2.27, M = 2.35 and M = 2.33 respectively). Expectedly, because of the previously stated, unemployed respondents stated a higher level of agreement of online shopping not fulfilling their expectations (M = 2.71) compared to the employed (M = 2.31).

Participants with different levels of education have different opinions about several aspects of online shopping, as evident from the Kruskal Wallis H test results. Significant differences were found in their of online shopping's safety ($\chi2(3) = 12.583$, $p = 0.005$), offering of better deals ($\chi2(3) = 8.197$, $p = 0.042$), product difference to advertising ($\chi2(3) = 18.452$, $p = 0.000$), level of fulfillment of expectations ($\chi2(3) = 14.908$, $p = 0.002$), the possibility of fraud ($\chi2(3) = 14.764$, $p = 0.002$) and their lack of online shopping literacy as well ($\chi2(3) = 12.597$, $p = 0.006$). The reasons why the likelihood of online shopping increases with an increase in the acquired level of education can be seen. The lower educated strongly disagree that they lack online shopping literacy (M = 1.11). They do not think online shopping is safe (M = 1.36) and offer better deals (M = 1.50). They disagree with not preferring and avoiding online shopping due to long delivery time (M = 1.42), the possibility of fraught (M = 1.43) and differences in products to the advertisement (M = 1.54). Still, their other views on online shopping can explain such behavior. Bachelor's education level respondents agree the most about catching better deals while shopping

online (M = 3.54). Still, they are the most likely to avoid online shopping due to products differing from advertisements (M = 2.39) and due to possible fraud (M = 2.27). The highest education level respondents see online shopping as the safest (M = 3.65).

5. DISCUSSION

Even though gender is considered one of the most influential demographic characteristics in explaining decision-making, the influence of gender on the online shopping decision of Croatian consumers' was not confirmed in this research. Therefore, in our model, gender did not influence the decision to shop online, and hypothesis H1 is rejected. However, age, the second variable we expected to make a difference, proved to do so. The influence of age is in a direction supported by previous literature: with an increase in age, the likelihood of shopping online decreases, and therefore, hypothesis H2 is confirmed. Moreover, the differences in views on online shopping between different age groups can partially explain such a movement. Although online shopping fulfills their expectations the most out of the group, the oldest generation does not recognize online deals as much better. The oldest age group does not grade the greater availability of information and utility of product reviews as the youngest group of participants does. The middle age group shows the highest online shopping literacy and is the wariest of possible fraud. Although additional research is needed to verify this thoroughly, the results may suggest that the middle-aged group of online consumers who matured alongside the rise of the Internet are more aware of peculiarities and adept at online shopping than younger consumers who grew up with the Internet as an everyday experience and older consumers who started to embrace it only at a more mature age.

Employed consumers are likelier to shop online than unemployed ones, confirming hypothesis H3. One might think that respondents from the subgroup "not-employed" are less keen to buy online because they have fewer funds. However, besides unemployed people, this group comprises all respondents who were not in a working relationship when they filled in the questionnaire, which includes students, retired people, homemakers, etc. Nevertheless, as today the employed consumers of most occupations have some exposure to online transactions, it might be speculated that they have more online experience and, therefore, less fear and resistance to buying online.

According to our results, the lower educated participants feel the most knowledgeable about online shopping. Such results seem counterintuitive and might be seen as a confirmation of Goethe's quote that doubt grows with knowledge. The evaluations of this subgroup on further online shopping statements showed they are less bothered with longer delivery time, the dangers of products not being true to what is advertised, or other possibilities of fraud. This might be because they see online shopping as unsafe and not offering better deals than in-store shopping. Although people with higher education levels are much more concerned about the differences in products and fraud, they tend to see online shopping as safe and an opportunity to get better deals. Such difference in perspective of respondents with higher levels of education helps to explain the higher likelihood of purchasing products online with the increase of attained education level of a consumer. The stated result leads to the confirmation of hypothesis H4. The level of urbanization of residence also showed no significance in our model; therefore, hypothesis H5 is rejected. Such results can be explained by the relatively equal spread of ICT infrastructure, which enabled similar opportunities for online shopping, i.e., the availability of the Internet does not differ significantly across the country, nor does its use in online shopping.

6. LIMITATIONS AND FUTURE RESEARCH

Although this sample allowed us to run the logistic regression, analyze online purchase preferences, and obtain statistically significant results, a larger sample might allow us to draw more telling conclusions, as such conclusions would allow for better generalization of consumer behavior while shopping online. In addition to a larger sample, we seek a better balance among respondents regarding gender and educational groups for future research. Finally, in our future research, we intend to collect data on respondents' place of residence and try to balance the number of respondents in the central regions of Croatia. Such an enriched research sample should allow for more representative conclusions about Croatian consumers and provide an opportunity to analyze possible regional differences among Croatian consumers.

7. CONCLUSION

This study confirmed most of our hypotheses and the expected behavioral differences between subgroups of consumers but also led to some unexpected conclusions. Although it should always be expected that some of the previously made assumptions will not be confirmed, as was the case for most of our assumptions, we still did not expect the rejection of our first hypothesis, i.e., that our logistic regression model would not confirm behavioral differences in online shopping between consumers of a different gender. This study's scientific importance is primarily the contribution of additional insights into factors impacting consumer online shopping behavior. The paper provides a stimulus for further investigating consumer decision-making factors. Decision-making is the keystone of decision theory and a significant part of microeconomics. The essence of consumer choice is their preferences. However, preferences are not autonomous, as numerous studies show that various socio-demographics and other factors influence preferences. In this research, preferences were influenced by age, education level, and employment status among the variables studied. At the same time, place of residence, apart from gender, did not play a role when considering its size. In the management field, particularly operations management and marketing, these findings could prove helpful in better understanding the effectiveness of sales efforts and channels. For business people, this research could help develop strategies for online sales and adjust inventory management. Researching consumer behavior, therefore, allows businesses to tailor their actions to meet the needs of their customers.

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ORGANIZATIONAL CULTURE IN THE COMPANY

Vice GULAM, Ph. D. Candidate
Ustanova upravljanje sportskim objektima, Zagreb

E-mail: Vice.Gulam@sportskiobjekti.hr

Abstract

Organizations are like people; they differ from individual to individual. Some are more flexible and open to development, while others are traditional and respect a clear hierarchy. Several factors affect the success of an organization and its ability to attract and retain the best employees to the extent that the core values and organizational culture are valued similarly. The organizational culture within the organization includes several elements that are noticeable as soon as the environment is well acquainted with them, namely: announcements in the media, the way employees communicate, dress and behave, the style of space decoration, colors used in promotional materials, and even organizational design.

Furthermore, these rituals occur within the company, fundamental beliefs, norms, values that are nurtured, and several other factors essential for raising awareness of the value of each employee within the system. The key to a successful organization is a culture based on firmly held beliefs and behaviors that employees accept.

Keywords: *organization, culture, employees, success, company*

JEL Classification: *M14, M19*

1. INTRODUCTION

Among the more critical factors of business and development, some economic organizations are also classified as organizational culture. Organizational culture is a critical aspect of any company, influencing the behavior of employees, productivity, and profitability. It refers to the shared values, beliefs, attitudes, and practices that shape how people work and interact within an organization. In this essay, we will explore the definition and characteristics of organizational

culture, discuss its importance in the company, and provide strategies for nurturing a positive organizational culture. Also, the company Zdravi napitci d.o.o. shows what the organizational culture looks like in practice and what the central problem organizations face when implementing organizational culture is.

Smart managers have realized that every organization also has its own corporate culture. Moreover, social anthropologists are as fascinated by corporate culture today as they are by the headhunting tribes in the past. This shows the critical role of corporate culture. Many researchers have found a positive relationship between organizational culture and performance. Stewart (2010) mentioned that profitability is the goal of every business. Examining your organization's work culture is one of the best places to start for improvement. He noted that the most potent components of work culture are the beliefs and attitudes of employees. He believes that people create culture. Stewart (2010) also found that an organization's cultural norms have a significant impact on everyone involved in the organization. These standards are almost invisible but are one of the first places to look if we want to improve performance and profitability. He wanted to know employees' beliefs or attitudes, referring to the "How are things done in the organization?" relationship between organizational performance. He went on to explain that successful managers must never allow the development of a high-performance work culture to happen by accident if the company is not to jeopardize its future. Although many studies have found that different companies in different countries prioritize different goals, the literature points to financial profitability and growth as the most common measures of organizational performance.

2. ORGANIZATIONAL CULTURE

The key to a successful organization is a culture based on a firmly held and widely shared set of beliefs supported by strategy and structure. When an organization has a strong culture, three things happen: Employees know how top management wants them to respond to any situation, employees believe that the expected response is the proper one, and employees know they will be rewarded for demonstrating the organization's values. Figure 1 shows the essential functions of organizational culture.

Figure 1. Functions of organizational culture

Source: adapted from Barać, 2019.

For this research, organizational culture is defined as "the collective programming of the mind that distinguishes the members of one organization from another. This includes the shared beliefs, values, and practices that distinguish one organization from another (Hofstede, 1980). That means that in this study, organizational culture was identified as a mediating variable. Various researchers use many terms to describe organizational culture. Likewise, organizational culture has various definitions. Many authors describe organizational culture as having to do with the unique qualities and styles of people, the organization (Kilman et al., 1985), and how things are done (Deal & Kennedy, 1982). Organizational culture sometimes is also referred to as "corporate culture." "Organizational culture" in a more "commercial" sense of organizational culture (Deal & Kennedy, 1982). According to Hofstede (1980: 34), organizational culture refers to the collective programming of the mind that distinguishes the members of one organization from another. This includes shared beliefs, values and practices that distinguish one organization from another. The beginning of formal writing in an organizational culture started with Pettigrew (1979). He introduced the anthropologist concepts like "symbolism, myths," and "rituals" that could be used in organizational analysis. Hofstede (1980: 43-65) identified the above dimensions as national cultural values. He says the national culture is

mainly based on different values children learn early. These values are solid and enduring beliefs unlikely to change over a person's lifetime.

On the other hand, organizational culture is based more on differences in norms and standard practices learned in the workplace. It is considered valid within the context of a particular organization. Cultural differences in the context of organizational cultures are often based on practice, while differences at the national level are based on values. Furthermore, according to Hofstede (1980: 34), three factors that determine employee behavior in the workplace are national culture, occupational culture, and organizational culture. Several elements shape organizational culture. The first are values, beliefs, and assumptions. These are the core principles that guide the behavior of employees and define what is essential to the company. The second elements are artifacts and symbols. These are tangible representations of the culture, such as logos, slogans, and office decor. The third element is patterns of behavior and communication. These unwritten rules govern how employees interact with each other and with customers. An organization's culture defines the proper way to behave within the organization. This culture consists of shared beliefs and values established by leaders and then communicated and reinforced through various methods, ultimately shaping employee perceptions, behaviors and understanding. Organizational culture sets the context for everything an enterprise does. Because industries and situations vary significantly, there is not a one-size-fits-all culture template that meets the needs of all organizations (Cingula, 1992).

Shared values, or culture, represent one of the seven key one's variables of McKinsey's 7S model of organizational effectiveness. This model was developed in the late 1970s by former consultants of McKinsey & Company.

Figure 2. McKinsey's 7S model
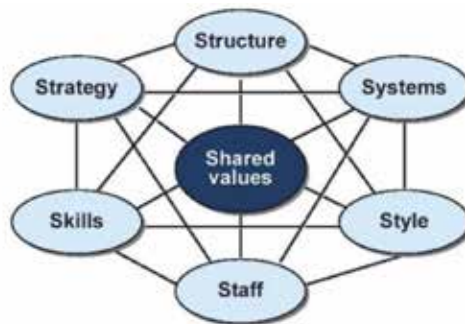
Source: adapted from https://www.valuebasedmanagement.net/methods_7S.html

Figure 2. shows the seven internal elements that organizations need to align to succeed. Although there is no consensus on the definition of organizational culture, most authors agree that organizational/corporate culture refers to overall, historically determined (by founders or executives), related to things studied by anthropologists (such as rituals and symbols) and things that are socially constructed are hard to change. A strong culture is a common denominator among the most successful companies. All have consensus at the top regarding cultural priorities, and those values focus not on individuals but on the organization and its goals. Successful company leaders live their cultures daily and go out of their way to communicate their cultural identities to employees and prospective new hires. They are clear about their values and how those values define their organizations and determine how the organizations run. As different segments of culture are observed, Žugaj (2004: 105-115) it is possible to determine numerous types of organizational culture:

1. Deal and Kennedy's typology of organizational culture

2. Edwards and Kleiner's typology of organizational culture

3. Scholz's typology of organizational culture

4. Handy's typology of organizational culture

Deal and Kennedy define corporate culture by the time it takes to get its perceptions about the task's success and according to the level of risk of a particular job. Edwards and Kleiner's typology is based on two criteria representing concern for people and performance. Scholz's typology of organizational culture is based on three dimensions with which it is possible to define several different types of culture. The first dimension - is the organization's tendency towards continuity or change, and the second dimension refers to the internal state of the organization. It is related to solving problems and making decisions, and the third dimension represents the organization's relationship with the environment and its way of solving the relationship. Handy's typology of organizational culture shows four basic types of culture associated with the appropriate organizational structure. The four basic types of culture are entrepreneurial culture or culture of power, role culture or bureaucratic culture, task culture or team culture and culture of the individual.

3. ORGANIZATIONAL CULTURE AS A MAKER OF SUCCESS BUSINESS EFFICIENCY SYSTEM

The importance of organizational culture in business success cannot be overstated, as it is a critical factor in achieving business success. A sustainability-based approach can promote the achievement of companies' social, environmental, and economic objectives, and those who adopt this approach tend to perform better than those who do not. A recent study analyzed the impact of organizational culture on business efficiency in successful companies, assessing organizational culture based on four traits: employee capacity development, sharing of core values, customer focus, and goals and objectives. The analysis revealed that great companies create a culture that means business and talented employees motivate each other to excel in these companies. As a result of such solid organizational cultures, greater profitability and productivity are achieved, making companies leaders in their respective industries. Therefore, businesses must prioritize the development of a robust organizational culture to ensure long-term success. Organizational culture is the set of values, beliefs, attitudes, and practices that shape the behavior of individuals and groups within an organization. The collective programming of the mind distinguishes one organization from another. Several key features characterize organizational culture, including shared values, beliefs, assumptions, socialization and learning, and symbols and artifacts. There are four types of organizational culture: clan, adhocracy, market, and hierarchy. Clan culture emphasizes collaboration, teamwork, and employee empowerment. Adhocracy culture is characterized by innovation, risk-taking, and flexibility. The market culture emphasizes competition, achievement, and results. Hierarchy culture values stability, control, and efficiency. Each type of organizational culture has its strengths and weaknesses, and companies may adopt different cultures depending on their goals and values. The impact of organizational culture on business efficiency has been a topic of interest in recent literature. Organizational culture comprises norms, values, and beliefs that shape an organization's behavior and its perception by employees and customers alike.

Additionally, it examines techniques for developing leadership skills, as well as assessing organizational culture based on four traits: employee capacity development, sharing of core values, customer focus, and goals and objectives. Overall, enhancing organizational performance through cultural transformation has become an essential aspect of business management, and many articles

provide a comprehensive guide for leaders looking to improve business efficiency through enhancing their organizational culture. Consistent with Porter (1985: 35-45), Gallagher and Brown (2007: 34-31), Kotter et al. (1992: 56-64) found that between 1977 and 1988, firms with a performance-enhancing culture increased their net income by 75%, while firms without a performance-enhancing culture increased their net income by only 1% over the same period. This is one of the proofs that the corporate culture of any company has an impact on a person's performance. Barlow (1999: 76-79) mentioned that organizational structure and culture could affect contractors' responses to innovative ideas and their ability to transform them into potentially successful products. He mentioned that there are still some structural and cultural barriers to introducing many new process innovations in the UK.

Regarding the relationship between innovation and performance, Bowen et al. (2009: 36) pointed out that this relationship is indeterminate. Organizational culture significantly impacts employee behavior, productivity, and profitability. A positive organizational culture can foster employee engagement, commitment, and satisfaction, leading to improved performance and innovation. It can also help attract and retain top talent, as employees are likelier to stay in a company that aligns with their values and beliefs. Conversely, a negative organizational culture can lead to low morale, high turnover rates, and decreased productivity. It can also lead to unethical behavior, such as fraud, corruption, and discrimination, damaging the company's reputation and bottom line. Therefore, companies must cultivate a positive organizational culture that aligns with their values and promotes ethical behavior (Kavčić, 1992).

4. THE INFLUENCE OF MANAGEMENT ON ORGANIZATIONAL CULTURE IN BUSINESS SYSTEM

Organizational culture is heavily influenced by leadership and management practices. Therefore, leaders need to align their management style with the organization's desired culture. Organizational culture is a crucial aspect of any business system, as it shapes its employees' values, beliefs, and behaviors. Management plays a significant role in shaping organizational culture, as it influences how people work together and interacts with each other, according to Stewart (2010: 34-36). A manager's technical skills contain his specialized knowledge,

his analytical abilities within his specialty, and his abilities to use means and techniques of a specific discipline which is the subject of the specialty of the profession. These skills, which the manager must possess, refer to good knowledge of work and technical expertise in the work problems the manager deals with. Technical skills have the most significant importance at lower levels of management.

In this essay, we will discuss the influence of management on organizational culture in business systems.

We will explore three key areas:
* management style;
* communication, and organizational structure;
* impact on organizational culture.

To Griffin (2003: 78-87), management style significantly impacts organizational culture. An autocratic management style, for example, leads to a hierarchical and rigid organizational culture. This management style is characterized by a top-down approach, where decisions are made by a single person or a small group of people. This approach can lead to a lack of employee involvement, resulting in a culture of compliance and conformity. On the other hand, a democratic management style fosters a culture of participation and collaboration. This management style involves employees in decision-making processes, which promotes a sense of ownership and responsibility. This approach can lead to a culture of innovation and creativity, as employees are encouraged to share their ideas and opinions. However, a laissez-faire management style can result in a culture of ambiguity and lack of direction. This management style is characterized by a hands-off approach, where employees are left to their own devices. This approach can lead to a lack of accountability and responsibility, resulting in a culture of confusion and disorganization.

Liao and Rice (2010: 100-109) said that communication is another essential aspect of organizational culture. Open communication promotes a culture of transparency and trust. Employees who feel they can communicate openly with their colleagues and management are more likely to be engaged and committed to the organization. Poor communication, on the other hand, can lead to a culture of misinformation and distrust. Employees who feel that they are not being informed about the organization's goals and objectives may become disengaged and disenchanted. This can lead to a culture of negativity and resistance. Effec-

tive communication can foster a culture of innovation and creativity. Employees who feel that their ideas and opinions are valued are more likely to be motivated and engaged. This can lead to a culture of continuous improvement, where employees are encouraged to think outside the box and come up with new and innovative ideas.

Kaplan and Norton (2001) conclude that organizational structure is the third key influencing organizational culture. A centralized structure can lead to a culture of bureaucracy and rigidity. This structure is characterized by a top-down approach, where decisions are made by a single person or a small group of people. This approach can lead to a lack of employee involvement, resulting in a culture of compliance and conformity. On the other hand, a decentralized structure can foster a culture of flexibility and innovation. This structure involves employees in decision-making processes, which promotes a sense of ownership and responsibility. This approach can lead to a culture of empowerment, where employees are encouraged to take risks and try new things. Finally, a flat structure can promote a culture of collaboration and empowerment.

The impact of organizational culture on performance and outcomes cannot be overstated. A strong organizational culture can increase productivity, employee satisfaction, and customer loyalty. For example, companies like Google and Zappos are known for their strong cultures, which have helped them to attract and retain top talent and achieve high levels of success. On the other hand, a weak or toxic culture can result in high turnover rates, low morale, and poor performance. For example, companies like Enron and Wells Fargo had toxic cultures that ultimately led to their downfall (Chien, 2004).

5. EMPIRICAL RESEARCH OF ORGANIZATIONAL CULTURE IN ZDRAVI NAPITCI COMPANY

Zdravi napitci is a company based in Zagreb, and the main branch of business is service activity. The company runs one small but trendy coffee place in Zagreb. The manager is aware that companies with positive, vibrant cultures attract the best talent to their teams and produce better products and services since their employees are more motivated to give 100% daily. A stellar workplace culture leads to a better work environment, improved employee engagement, and a better representation of a company's mission. In contrast, poor company culture can negatively affect performance and employee results. Em-

ployees are likelier to leave companies with poor, draining cultures and produce less than stellar products. Zdravi napitci has ten employees, but they all work as a team. They believe everything they do has a lasting impact on their guests and that work starts and ends with intensive care for guests. This company has a strong, caring culture, emphasizing harmony in the organization and teamwork. They provide their employees with a relaxed culture that is based on entertainment. They believe that the workplace's fun and relaxed atmosphere helps their employees when coming up with or creating big and creative ideas. The guests recognized the excellent atmosphere and energy among the employees and managers, which is why they keep coming back and why this small coffee place is so popular. Employees are loyal to the company and rarely change. New employees adapt quickly to the work atmosphere and feel comfortable and easily find friends because it has created a culture where everyone wants to get to know each other, and there is no competition between employees. Such a caring culture can create problems during the realization of assigned tasks and affect employee performance.

The organizational culture research was carried out through a questionnaire in which all employees participated. The company has one manager, two cleaners, five servers and two bartenders.

Chart 1. Survey questionnaire
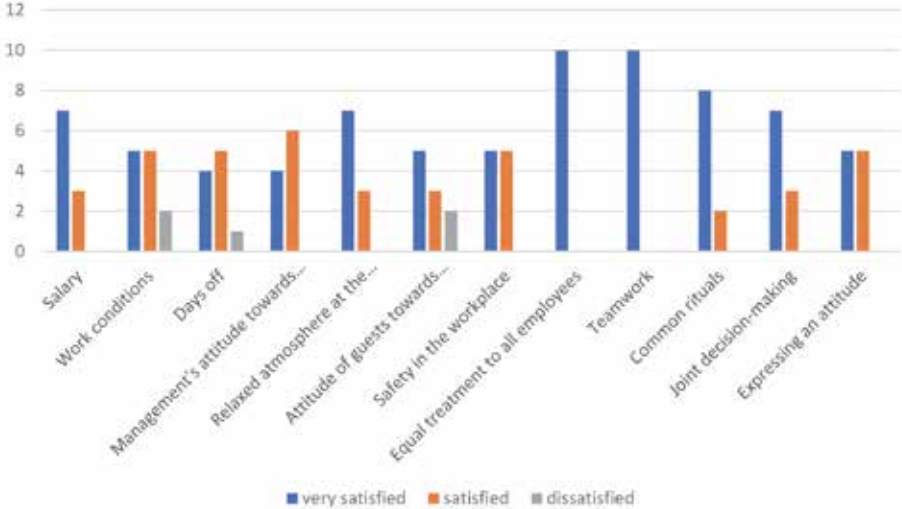
A survey of all ten employees concluded that they are satisfied with this small company's organizational culture and relationships. Everyone in the company is harmonious, like to work together and has equal contact with everyone. However, the most important thing is the behavior towards the guest, which is the same for everyone. Also, it is equally essential that the relationship between owners and management is equal towards all employees. Only such companies can create a difference in the market and continue to operate successfully.

6. DEVELOPMENT OF ORGANIZATIONAL CULTURE IN THE FUTURE

Companies that spend time understanding and optimizing their cultures will be differentiated in the marketplace. One of the most common misconceptions surrounding organizational culture is that it cannot be changed —it evolves on its own and "happens to" employees. However, the longer the mindset of "it has always been this way" lives, the longer that mindset reigns. Organizational culture is the most critical factor in determining an organization's success or failure (Deal & Kennedy, 1982: 100-104). It has been shown repeatedly that company culture influences employees' job satisfaction, morale, performance, engagement, attitudes, motivation, commitment to their organizations and turnover (Brush et al., 1992; Zila, 2001).

Additionally, having a more consistent "performance enhancement" culture (i.e., closer alignment between company culture and business strategy) can lead to higher growth across sectors, including revenue growth, share price growth and net income growth. For example, Kotter and Heskett (1992) found that companies with consistent cultures had a 682% average revenue growth compared to the 166% average growth for companies without cultural adjustments. Their shares are also up 901%, compared with 74% for their peers. In short, aligning organizational culture with business goals and strategy with intentions and efforts returns helps increase sales and growth and create an overall positive employee experience.

The evolution of organizational culture in the digital age has become a critical aspect of business success, as the digital economy demands new ideas, information, and business models that continually expand and shift into new ventures. A successful organization has a culture based on a firmly held and widely shared set of beliefs, supported by strategy and reinforced by tools such

as ceremonies and policies to instill and spread its norms and values. As the workplace environment changes, it is essential to map out the evolution of work and implement strategies to build a positive organizational culture conducive to the stable growth of a company. Research suggests eight key points to building a positive organizational culture: aligning values with actions, creating a sense of purpose, empowering employees, fostering teamwork, promoting transparency, investing in employee development, providing continuous feedback, and recognizing successes and failures. Furthermore, innovating in a digital culture translates to calculated risk-taking, and organizations that adopt disruptive technologies tend to be the ones that excel in the digital age. To prepare for the future, businesses must look closer at possible worlds of work for 2030.

Moreover, develop strategies to promote capacity development, fundamental values, and solid organizational culture. You will go through culture change faster if you implement your strategy correctly and consistently you think. The key is conscious and sustained effort. The basis of this approach is as follows Believe that organizational culture should be carefully designed and nurtured, and Leaders and managers should develop proactive intervention strategies (Chenhall, 2005). At the top, leaders must first understand what culture is, why it matters, and what type of culture it is culture they want to pursue. Once leadership has prioritized this, identifying and communicating Employee training and engagement culture is ideal.

7. CONCLUSION

Organizational culture is a critical aspect of any business, as it sets the tone for how employees interact with each other and customers. A strong organizational culture can increase productivity, employee satisfaction, and customer loyalty. On the other hand, a weak or toxic culture can result in high turnover rates, low morale, and poor performance.

Overall, the results of this study show that organizational culture plays an essential role in whether people want to work for a company, how hard they work, and how long they stay). Organizational culture refers to the shared values, beliefs, attitudes, and assumptions that shape the behavior of individuals within a company. The unwritten code governs how employees interact with each other and with customers. Understanding organizational culture is crucial for managers and leaders, as it helps them to create a positive work environment

that fosters productivity and growth. A strong organizational culture can also attract top talent and enhance a company's reputation. Caring culture has the most significant impact on whether employees recommend it as a great place to work. This means that due diligence can enhance a company's external reputation. The achievements of this paper demonstrate that caring can be expressed in company culture through support, investment, appreciation, and appreciation belief. In short, employees are human, too, and they do not lose their humanity at work. They want to feel cared for, not treated like a cog in a machine. Companies that permeate their culture will care about and encourage this feeling in their employees, which will increase their productivity and performance.

In conclusion, organizational culture is a critical aspect of any business. It shapes the behavior of employees and defines what is essential to the company. Understanding organizational culture is crucial for managers and leaders, as it helps them to create a positive work environment that fosters productivity and growth. A strong organizational culture can increase productivity, employee satisfaction, and customer loyalty. In contrast, a weak or toxic culture can result in high turnover rates, low morale, and poor performance. By building a strong organizational culture, companies can create a competitive advantage that sets them apart.

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RECENT DEVELOPMENTS IN INFLATION INEQUALITIES IN CROATIA

Marina TKALEC, Ph.D.
The Institute of Economics, Zagreb

E-mail: mtkalec@eizg.hr

Ivica RUBIL, Ph.D.
The Institute of Economics, Zagreb

E-mail: irubil@eizg.hr

Ivan ŽILIĆ
Croatian National Bank

E-mail: zilicivan@gmail.com

Abstract

The consumer price index, one of the most essential and popular measures of inflation, is traditionally measured by a single number. Although simple and practical, the indicator ignores that not all households face the same price increase, that is, the fact that the inflation rate, like many other economic variables, has a distribution. In this paper, through a distributional prism, we study consumer price inflation in Croatia in the COVID-19 and post-pandemic period 2020 – 2022. We calculate household inflation rates based on household-level data from the Household Budget Survey and official price indices of consumption categories at the lowest level of aggregation. Apart from depicting the distribution of inflation rates through time, we calculate inflation inequalities based on the distribution of household income in Croatia, namely on income deciles. Our results show that there are significant inflation inequalities. For example, in November 2022, the inflation rate for the poorest 10 percent of households was more than six percentage points above that for the wealthiest 10 percent. During 2021, due to fuel price hikes and the rich spending more on transportation, the poorest 10 percent experienced an inflation

rate lower than the wealthiest 10 percent. As opposed to the official inflation rate that is "plutocratic" by construction and biased towards the rich, we calculate the so-called "democratic" rate by construction impartiality. Consequently, the official inflation rate is biased since it is more like the inflation rate relevant to richer households than to poorer households.

1. INTRODUCTION

With economic growth, unemployment, interest rates, economic policies, and international trade, inflation is among the most important phenomena, significantly impacting individuals, businesses, and the overall economy. Inflation refers to the general increase in the price level of goods and services over time. The most common measure of inflation is the consumer price index (CPI), which is measured and published regularly by official national statistical offices. The CPI is a measure of the average change in prices over time in a fixed basket of goods and services that are commonly consumed by households. Policymakers, economists, and businesses use the CPI to track inflation, adjust economic policies, and make investment decisions. It is also used to adjust wages and salaries, social security payments, and other payments tied to the cost of living.

The interest in inflation has increased recently since the trend in inflation rates considerably reversed in the summer of 2021. After decades of low and stable inflation rates, the CPI recorded increasing rates worldwide. For example, the average annual CPI rate in Croatia from 1999 to 2020 was 2.1 percent, 2.6 in 2021, and 10.8 percent in 2022. In modern economic policy, inflation is usually represented by a single number - the official inflation rate. Although simple and practical, the single indicator ignores the fact that not all households face the same price increase, that is, the fact that inflation, like many other economic phenomena, has a distribution.

Back to Engel (1857), it was known that inflation has a distribution. Engel's law describes that as income increases, the proportion of income spent on food decreases, even if absolute food expenditure increases. Inflation distribution, in the context of Engel's law, refers to the effect of inflation on the distribution of income spent on different goods and services. When there is inflation, the prices

of goods and services generally increase, which can affect consumers' spending patterns. Inflation can impact different goods and services differently, and as a result, it can change the proportion of income that consumers allocate to different categories of goods and services. For example, if there is high inflation in food prices but low inflation in the prices of other goods and services, the proportion of income spent on food will increase relative to other goods and services. This means that inflation can change the distribution of income spent on different categories of goods and services, which can have important implications for the overall economy.

The recent spark of interest in the distribution of inflation comes from a general increase in interest in income inequalities. Additionally, an inflationary environment and household-level data availability influence the growing interest in the topic. The downside of a single inflation rate is that it does not represent the inflation experience of all households equally well. Each household has its consumption basket, while the inflation rate measures price changes for the entire economy, as if all residents were one large household. Kaplan and Schulhofer-Wohl (2017) show for the US that the consumer basket on which the official inflation rate is based does not represent any real household's basket. Their calculation suggests that the inflation rate for some households is lower than the official rate, and for some, it is higher, owing to the household-specific consumption basket. The degree to which the household experiences an inflation rate will be reflected in the official rate depending on the similarities between the household-specific consumption basket and the structure of the basket on which the official inflation rate is based.

This paper studies consumer price inflation in Croatia in the COVID-19 and the post-pandemic period 2020 – 2022. We calculate household-specific inflation rates based on household-level data from the Household Budget Survey (HBS) and official price indices of consumption categories at the lowest level of aggregation in the COICOP classification. Apart from depicting the distribution of inflation rates through time, we calculate inflation inequalities based on the distribution of household income in Croatia, namely on income deciles. Our estimates are the so-called "democratic" inflation rate, calculated as an average of the baskets of all surveyed households. In contrast, the official inflation rate, or the so-called "plutocratic" rate, is based on a basket that reflects the baskets of households with higher consumption and income. We show that the official inflation rate is biased since it is more similar to the inflation rate

relevant to richer than poorer households. Our results show that there are significant inflation inequalities. For example, in November 2022, the inflation rate for the poorest 10 percent of households was 6.3 percentage points above that for the wealthiest 10 percent. During 2021, due to fuel price hikes and the rich spending more on transportation, the poorest 10 percent experienced an inflation rate lower than the wealthiest 10 percent (1.6 percent compared to 2.9 percent). The difference between the 10th and 90th percentile in the distribution of inflation in 2022 (compared to 2020) amounted to 6.2 percentage points and ranged from 10.9 to 17.1 percent. The middle 50 percent of the distribution stretched from 12.3 to 15.5 percent, and the median was at 13.9 percent, 0.3 percentage points above the official rate.

This paper builds on the work by Rubil et al. (2023), which is the first analysis of inflation in Croatia from a distributional perspective using micro-data. The authors analyzed household-level inflation, incomes, and types of households from 2001 to 2021. However, the analysis focused on the 12 main COICOP categories, while here, on the other hand, we use the lowest possible level of aggregation, or 252 COICOP categories, thereby obtaining more reliable results. That way, we circumvent the so-called aggregation bias and limit the potential for estimating only a lower bound on actual inflation inequality. Jaravel (2021) emphasizes that aggregation underestimates inflation inequality because the distribution of inflation is more dispersed when estimated using data on the consumption structure at a lower level of aggregation of goods. We also use the latest available HBS survey wave from 2019, while the previous study used 2017 data. This considers the most recent changes in the structure of consumption baskets and their accompanying effects on inflation.

The rest of the paper is organized as follows. The second chapter provides an overview of research on inflation inequalities, while the third chapter details the calculation of the official inflation rate in Croatia. In the fourth and fifth chapters, we consider inflation inequalities in Croatia and estimate inflation at the household level. The sixth chapter concludes the paper.

2. REVIEW OF INFLATION INEQUALITY RESEARCH

The 19th century Engel's law (1857) implies that inflation has a distribution, contrary to the typical modern statistical toolset that presents inflation as a

single number measure. Since households with different incomes consume different baskets of goods, their inflation rates are different. Jaravel (2019) shows that there is much more innovativeness, supply, and competitiveness in products and services bought by more affluent households. However, income is not the only gradient that causes heterogeneity in inflation rates across households. For example, age is a strong gradient as well. Aguiar and Hurst (2007) use scanner data to show that older households buy more often and pay lower prices when compared to middle-aged households. The state of the economic cycle also affects household inflation, mainly through shopping behavior. Nevo and Wong (2019) argue that consumers changed their shopping behavior during the Great Recession. Most households started buying more frequently, often on sale, in larger sizes, and buying generic products. Handbury (2021) adds the gradient of location, as he shows that local income-specific tastes drive the products and prices offered in markets. His model suggests that high-income households have lower grocery costs in wealthy cities than in poor cities, while low-income households have slightly higher grocery costs in these locations. A study by Cavallo (2017) adds a gradient of online vs. offline shopping. He finds that 76 percent of products were available in physical stores and online.

The prices for these products were identical in 72 percent of cases. However, the remaining 28 percent prices were the closest for electronics and clothing and the most diverse for pharmaceutical products. Finally, the COVID-19 pandemic was also responsible for significant differences in inflation rates. Cavallo (2020) uses credit card data to suggest that consumption patterns abruptly changed during the pandemic, which affected the inflation rate calculation. He recalculates the national inflation rate for 19 countries and finds that the COVID inflation rate was above the official rate in 12 out of these 19 countries. Jaravel (2021) summarizes the distributional aspects of inflation and provides guidelines for calculating household-specific inflation rates. He uses detailed price scanner data and bases his analysis on 256 product categories for the US to show that in the 2004 – 2015 period, the difference in inflation rates between the poorest and most affluent 20 percent was 4.2 percentage points for the entire period. This difference was even greater for non-durable goods, which have a higher share in the consumption basket of people with low incomes, amounting to 7.9 percentage points for the period examined.

Although earlier research on inflation inequality indicated that inflation between income groups is not high (Amble & Stewart, 1994; Garner et al., 1996;

Crawford & Smith, 2002; Hobijn & Lagakos, 2005; McGranahan & Paulson, 2006), improved and more-detailed data sets on both consumption and prices enable more precise measurement of inflation. Wimer et al. (2019) recalculate poverty and income inequality trends in the US for 2004 – 2018. Their results suggest that poverty in 2018 was much more aggravated than previously thought and that real household incomes for the poorest 20 percent fell by 7 percent compared to the period's beginning. Kaplan and Schulhofer-Wohl (2017) use scanner data and confirm that the average "plutocratic" consumption basket does not represent any household in the US. The interquartile range of household inflation rates was between 6.2 and 9 percentage points annually. Their thorough investigation concludes that less than two thirds of variation originate from price inequalities, around a third from the composition of items inside a consumption category, and only 7 percent from the structure of the consumption basket.

The most important study on inflation inequalities in the EU (but without Croatia) is the one of Gürer and Weichenrieder (2020). The authors examine 25 EU countries using 30 consumption categories from 2001 to 2015. Using survey data, they adjusted the consumption baskets of households based on income. They found that the consumption basket of the poorest 10 percent was, on average, 11.2 percentage points more expensive than the basket of the wealthiest 10 percent. Rubil et al. (2023) ran a similar analysis for Croatia on an overlapping period and found comparable results: the poorest 10 percent had 10.8 percentage points higher inflation in the 2001 – 2021 period.

The pandemic of COVID-19, but also the war in Ukraine, and elevated inflation rates throughout the World suggest that research on inflation inequality is still relevant today. Cavallo (2020) showed that the pandemic changed the weights in the consumption basket predominantly in favor of food and away from services and fuel. Since mostly poorer households consume relatively more food, and richer households consume relatively more fuel and services, the inflation rate in the first half of 2021 was higher for richer households. However, the trend reversed as food prices started gaining momentum in Fall 2021. The pressures on food and energy prices were exacerbated by the war in Ukraine, which began in February 2022 and caused an additional increase in food prices, which hit poorer households particularly hard. Artuc et al. (2022) argue that the war in Ukraine reduced real incomes by an average of -1.5 percent. They examine 43 countries and find that the decline in real incomes is caused by higher food prices and the empirical fact that poorer households spend relatively more of their income on food.

3. CALCULATION OF THE OFFICIAL INFLATION RATE IN CROATIA

The Croatian Bureau of Statistics (CBS) is the official public body for calculating the consumer price index. The CBS defines the consumer price index as the changes in the general price level of goods and services[1] that private households pay (or, in some cases, use without payment) for consumption over a specified period. The two main determinants of the index are goods consumed by households and changes in the prices of these goods.

CBS collects around 38,000 monthly prices at a pre-defined sample of points of sale in nine locations. Geographical locations are selected according to the criteria of population and representativeness for each spatial unit from the National Classification of Spatial Units for Statistics. There are three such units, and they consist of: Northwestern Croatia (Zagreb City, Zagreb, Krapina-Zagorje, Varaždin, Koprivnica-Križevci, and Međimurje counties), Central and Eastern (Pannonian) Croatia (Bjelovar-Bilogora, Virovitica-Podravina, Požega-Slavonia, Brod-Posavina, Osijek-Baranja, Vukovar-Srijem, Karlovac and Sisak-Moslavina counties) and

Adriatic Croatia (Kvarner, Lika-Senj, Zadar, Šibenik-Knin, Split-Dalmatia, Istria and Dubrovnik-Neretva counties). The final selected geographical locations are the cities of Zagreb, Slavonski Brod, Osijek, Sisak, Rijeka, Pula, Split, Dubrovnik, and Varaždin. In addition to local price recording, data on nationally homogeneous prices are collected directly from reporting units or via central price recording. Also, from January 2021, prices are collected using the web scraping technique for selected groups of products (such as rent, household appliances and electronics). The goods and services included in the collection of prices are those that the reference population buys for consumption, with the minimum criterion that households spend more than one per thousand of their total expenditure on that product (based on HBS). The prices of around 900 products were used to calculate the inflation rate in 2022.

The HBS is a nationally representative annual survey that collects data on the consumption of goods according to the COICOP classification on a sample of private[2] households representative of the population of the Republic of Croatia.

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[1] The generic term "goods" instead of "goods and/or services" will be used in the rest of the text.

[2] Excluded are the so-called "collective households", such as hospitals, homes for the elderly, prisons, etc.

Besides expenditure, HBS collects socioeconomic and demographic household characteristics such as income, household size, age, and activity. HBS for 2019, which is used in the calculation of the inflation rate for 2022, contains data for 1,809 successfully surveyed households from a sample of 5,460 households.[3] The aggregate weights that the CBS uses to calculate the CPI are weights for a particular good or service in the reference consumer basket calculated as a ratio of the aggregate consumption of that good and the aggregate consumption of all goods and services. Figure 1 shows the aggregate consumption structure 2019 for the 12 main COICOP classification categories, calculated based on data from HBS. Expenditures for food and nonalcoholic beverages have the largest share, as much as 27.5 percent, followed by Housing and energy consumption at 16.1 percent and Transportation at 15.4 percent (composed mostly of car fuel). Less is spent on categories such as Alcoholic beverages and tobacco (2.8 percent) or Education (0.6 percent).

Figure 1. Structure of consumption expenditures in 2019
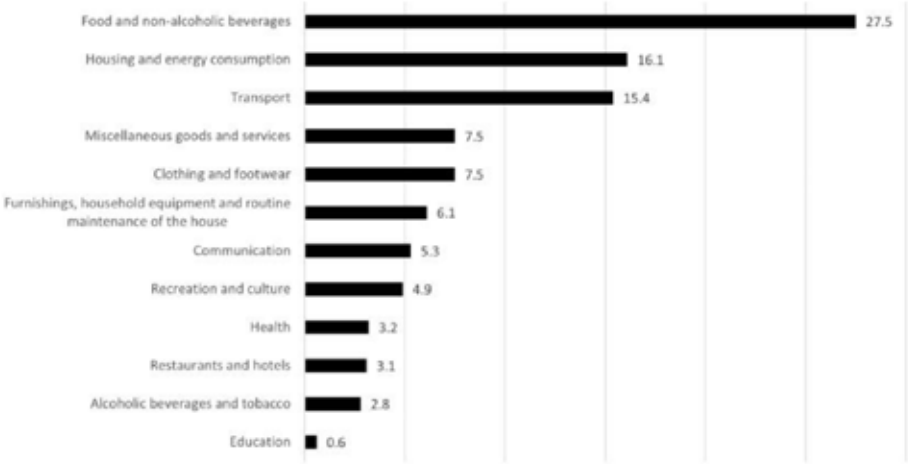
Source: Author's calculation based on HBS 2019.
Note: The sum of shares equals 100. Consumption categories are first-level categories according to the COICOP classification.

Ley (2002, 2005) corroborates that the aggregate weights used in the CPI calculation are closer to the consumption baskets of households with a higher

income. Inflation based on these aggregate weights is called "plutocratic" (Prais, 1959). Studies for the UK (Muellbauer, 1974), the USA (Deaton, 1998), and Croatia (Rubil et al., 2023) show that the official inflation rate best represents households around the 71st, 75th, and 80th percentiles of the income distribution. Rubil et al. (2023) show that one can alternatively use average shares for weighting to obtain "democratic" inflation. The "Democratic" inflation rate gives the same weight to each household, regardless of its total expenditure and/or income, thus representing a median household, at least in terms of consumption patterns. More details on the differences between different calculations of weights for the inflation rate can be found in Rubil et al. (2023).

4. INEQUALITY OF INFLATION IN CROATIA

Every month, CBS publishes the general price index and price indices for the 12 main categories of goods or the first level of the COICOP classification (categories shown in Figure 1), but recently also for other categories on a lower level of aggregation. These indices rely on a typical and homogenous consumption basket, ignoring the fact that different households have a different structure of their consumer basket depending on their socioeconomic characteristics. In addition, households also pay different prices for the same goods and services. Thus household inflation has two potential sources of inequality: prices and consumption structure. The HBS provides consumption structure on the household level, but price indices are available for categories of goods, not for the actual prices households pay.

Using micro-data from HBS, we can extract the structure of the consumer basket for each surveyed household and combine these with price indices for 252 categories of goods. This enables the calculation of household-level inflation and shows the entire distribution of inflation. Since HBS contains income-level data, we can also group households into income decile groups. Contrary to the "plutocratic" official price index, we use average weights and calculate the "democratic" inflation rate for households in Croatia. As shown in Rubil et al. (2023), the price index for household i in time t (month or year) can be written as follows:

$$q_i(t, t_0) = \sum_{k=1}^{K} w_i^k q^k(t, t_0),$$

(1)

where w_i^k is the weight of goods category k for household i (the share of consumption of goods category k in the total consumption of household i), and $q^k(t, t_0)$ is the price index of goods category k in year t concerning the base year t_0. In our specific case, the categories $k = 1, 2, …, 252$ are the categories of the COICOP classification on the lowest level of aggregation. The unit of time is either year, where the base year is 2020 or the previous year, or the month with the base in the same month of the previous year. The time frame spans from January 2020 to December 2022. The weights w_i^k are fixed for all periods as the survey is conducted every two or three years, and the latest results are available for 2019.[4] Since we use fixed weights from a period that even precedes our base year (2020 in our case), we are, in principle, calculating the Laspeyres price index. The Laspeyres price index assumes there are no adjustments of the basket to price movements, so the Laspeyres index, in essence, overestimates the inflation rate, as it ignores potential substitution effects in case of changes in relative prices (Beck, 2015). Gürer & Weichenrieder (2020) construct a simple model in which they show that households with higher incomes have a stronger substitution effect at their disposal, which means that the difference between the inflation rates of the rich and the poor will only be greater, even in the case of the Laspeyres index which overestimates the inflation rate.

Equation (1) enables the calculation of price indices for each household, after which we can average the indices based on selected groups of households (j) according to the equation:

$$q_j(t, t_0) = \frac{1}{n_j} \sum_{i \text{ from group } j} q_i(t, t_0),$$ (2)

Where n_j is the number of households belonging to group j. We focus on the

Following groups of households: 10 decile groups defined by deciles of household disposable income per adult equivalent, where the number of adult equivalents is determined using the modified OECD equalization scale. Combining equations (1) and (2), we get:

$$q_j(t, t_0) = w_i^k) \, q^k(t, t_0) = \sum_{k=1}^{K} \left(\frac{1}{n_j} \sum_{i \text{ from group } j} \sum_{k=1}^{K} w_j^k q^k(t, t_0) \right),$$ (3)

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[4] A new wave of the HBS was conducted in 2022 but the results will not be available before 2024.

Which means that the price index specific to household group j is determined by "democratic" weights of goods categories $k = 1, \ldots, K$ specific to group j and price indices for goods categories $k = 1, \ldots, K$. The "democratic" price index for the population as a whole can be expressed by:

$$q_{DEM}(t, t_0) = \sum_{k=1}^{K} \left(\frac{1}{n} \sum_{i=1}^{n} w_i^k \right) q^k(t, t_0) = \sum_{k=1}^{K} w^k q^k(t, t_0),$$

(4)

Where n is the total number of households in the population, and w^k is the democratic weight of the goods category k for the entire population. Before presenting the democratic price index for the population and income decile groups, we first present weights for income decile groups for the 12 main COICOP categories. Table 1 shows the democratic weights w_j^k averaged for each group of households and the weights used by the CBS to calculate the official inflation rate in 2022 (plutocratic weights based on HBS from 2019).

We highlight three observations. First, in the two most significant categories, "Food and nonalcoholic beverages" and "Housing and energy consumption," the weights decrease with income. Contrarily, in the categories "Clothing and footwear", "Transport", and "Restaurants and hotels", the weights increase with income. There is a significant difference in weights between the poorest 10 percent and the richest 10 percent of households. Second, the sum of weights of the categories "Food and nonalcoholic beverages" and "Housing and energy consumption" is significantly lower in the richest 10 percent of households (36.5 percent compared to 67 percent) when compared to the poorest 10 percent. For other categories of goods, except for alcoholic beverages, tobacco, and health, the weightings are higher for the richest 10 percent of households. Third, the weightings of the poorest 10 percent are very far from the basket used by CBS. In other words, the plutocratic weights used by the CBS are very similar to those of the richest 10 percent of households.

Table 1. Weights for decile groups and the official CBS weights for the national price index

Consumption category	Income decile groups										CBS
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	2022
1	43.1	35.4	33.5	31.6	29.0	28.7	28.1	26.1	23.8	22.0	25.9
2	3.0	3.1	2.9	3.2	3.3	2.6	3.1	3.1	3.5	2.7	5.1
3	3.4	4.3	5.1	6.2	6.5	6.4	7.2	7.5	7.9	8.6	5.8
4	23.9	23.7	22.6	20.9	18.9	16.9	16.1	15.2	16.1	14.5	16.9
5	4.5	4.7	4.5	5.2	5.4	5.6	5.8	6.3	5.8	7.4	5.7
6	3.6	3.7	3.5	3.0	3.0	2.6	3.0	3.4	3.1	3.5	3.2
7	4.4	6.7	9.3	10.5	13.5	15.4	14.4	15.5	15.7	15.8	14.7
8	4.6	5.5	5.6	5.6	5.8	5.8	5.9	6.0	5.7	5.3	5.5
9	4.1	4.6	4.5	4.5	4.2	4.4	5.0	4.9	5.6	6.1	5.3
10	0.1	0.3	0.2	0.2	0.5	0.8	0.6	0.6	0.5	0.6	0.7
11	0.6	0.9	1.5	1.8	2.3	3.0	3.0	3.5	4.5	5.2	5.0
12	4.8	7.1	6.8	7.2	7.7	7.9	7.8	7.9	7.9	8.3	6.2
TOTAL	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*

Note: 1 – Food and nonalcoholic beverages; 2 – Alcoholic beverages and tobacco; 3 – Clothing and footwear; 4 – Housing and energy consumption; 5 – Furnishings, household equipment and routine maintenance of the house; 6 – Health; 7 – Transport; 8 – Communication; 9 – Recreations and culture; 10 – Education; 11– Restaurants and hotels; 12 – Miscellaneous goods and services.
Sources: CBS for official weights and authors' calculations based on HBS 2019 for decile group weights.

After the weights, we also show the movement in prices of these same 12 categories of goods in the period examined, 2020 – 2022. Table 2 presents the percentage change in prices in 2022 compared to 2020. The first row (Total) shows the official inflation rate for the given period, which was 13.7 percent. We observe that in the same period, the prices of "Food and nonalcoholic beverages" increased by 17.8 percent, and the prices of "Housing and energy consumption" increased by 11.8 percent. These two categories alone make up two-thirds of the consumption basket of the poorest 10 percent of households. The prices in the group with the third largest weight in the official index of consumer prices, "Transport", increased by as much as 23.6 percent in the period examined.

Table 2. Price change by main COICOP categories in 2022 compared to 2020

Consumption category	Price change (in %)
TOTAL	*13.7*
Transport	23.6
Restaurants and hotels	17.9
Food and nonalcoholic beverages	17.8
Furnishings, household equipment and routine maintenance of the house	13.5
Housing and energy consumption	11.8
Miscellaneous goods and services	10.6
Alcoholic beverages and tobacco	9.7
Recreation and Culture	9.1
Clothing and footwear	7.0
Health	2.8
Education	1.6
Communication	1.4

Source: authors' calculations based on CBS data.

5. INFLATION RATES AT THE HOUSEHOLD LEVEL

We can show the distribution of household inflation in Croatia using five different percentiles: the 10th, 25th, 50th, 75th, and 90th. The difference between the 10th and 90th percentile in the distribution of inflation in 2022 (compared to 2020) amounted to 6.2 percentage points and ranged from 10.9 to 17.1 percent. The middle 50 percent of the distribution stretched from 12.3 to 15.5 percent, and the median was at 13.9 percent, 0.3 percentage points above the official rate. Figure 2 shows these five percentiles over the examined period as monthly year-on-year rates and the official CBS inflation rate. There are three observations. First, the difference between percentiles is tighter at the beginning of our sample, when inflation was low. The whole distribution of inflation starts to widen as we move to a higher inflationary period, especially in 2022. For example, the difference between the 10th and 90th percentiles in January 2020 stood at 2.5 percentage points; by the end of December 2022, it increased to 8.1 percentage points. This implies that higher inflation leads to bigger inequalities in inflation rates. The second and trivial observation is that the whole distribution moves to the right, i.e., that the median value of inflation increases. The median inflation rate in January 2020 was 2.3 percent, finishing with 13.9 percent in December

2022. Third, the official CBS inflation rate reasonably closely follows the median value, except in the second half of 2022, when the median value starts to diverge from the official rate.

Figure 2. Distributional aspects of inflation (year-on-year; in %; percentiles)
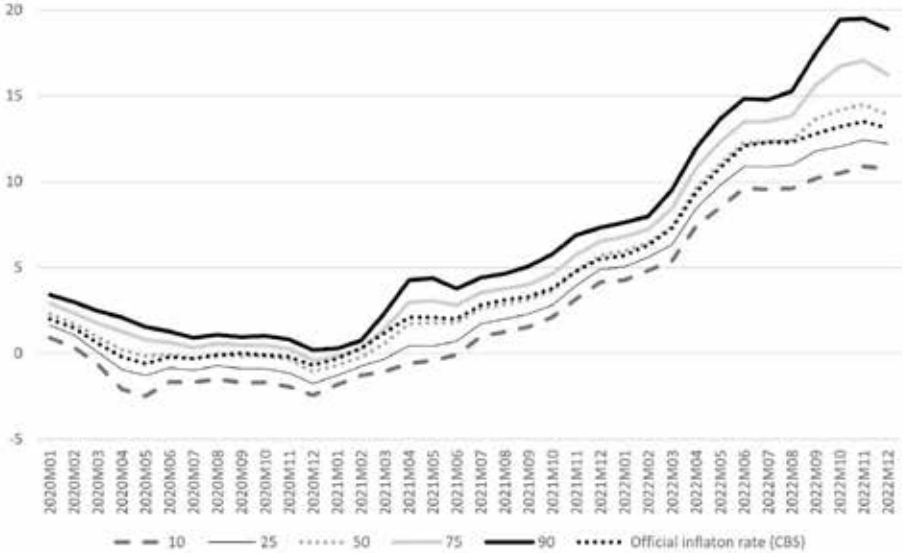
Sources: CBS for the official inflation rate and author's calculations based on HBS data from 2019 and the price index for 252 COICOP classification categories published by CBS for percentiles.

Moving to the income gradient, Table 3 shows the inflation rates by income decile groups from 2020 to 2022 (annual averages) and the difference in inflation rates concerning the 10th decile group (10 percent of the richest). Inflation for the poorest 10 percent was 14.5 percent, while for the richest 10 percent, inflation was at 13.3 percent, a difference of 1.2 percentage points. The difference compared to the 10th decile group for the remaining decile groups abruptly decreases but increases again close to the median income group.

Table 3. Inflation rate by income decile groups

Decile group	Inflation rate in 2022 compared to 2020 (in %)	The difference compared to the richest 10 % (in percentage points)
1	14.5	1.2
2	13.9	0.5
3	13.8	0.5
4	13.7	0.4
5	14.2	0.9
6	14.2	0.8
7	14.1	0.8
8	14.1	0.7
9	13.9	0.6
10	13.3	-

Note: Decile groups refer to the distribution of equalized household disposable income.
Sources: author's calculations are based on HBS data from 2019 and the price index for 252 COICOP classification categories published by CBS.

It is more interesting to see how inflation rates for different income decile groups moved over time. Figure 3 presents monthly year-on-year inflation rates for the first and the tenth income decile (10 percent poorest and richest households). A figure depicting all income deciles can be found in the Appendix (Figure A1), and it clearly shows that the rates for the decile groups between the first and tenth are between these two, with the apparent tendency for the lower groups to have a higher inflation rate. During 2020, the start of the pandemic, and tight movement and activity restrictions, inflation rates across households stayed low, more-or-less homogenous, and moved in tandem. In early 2021, inflation rates for the richest started to move away as fuel prices surged. Inflation rates for the poorest started to catch up by the end of the year as most food prices started to rise. The difference between the inflation rate of the 10 percent poorest and the 10 percent richest households turned to positive territory in December 2021, and the gap widened to 6.3 percentage points in October 2022 when it peaked—the year ended with the poorest households depicting a 5.6 percentage points higher inflation rate than for the richest households.

Figure 3. Inflation rate for the 10 percent poorest and richest households (year-on-year; in %)
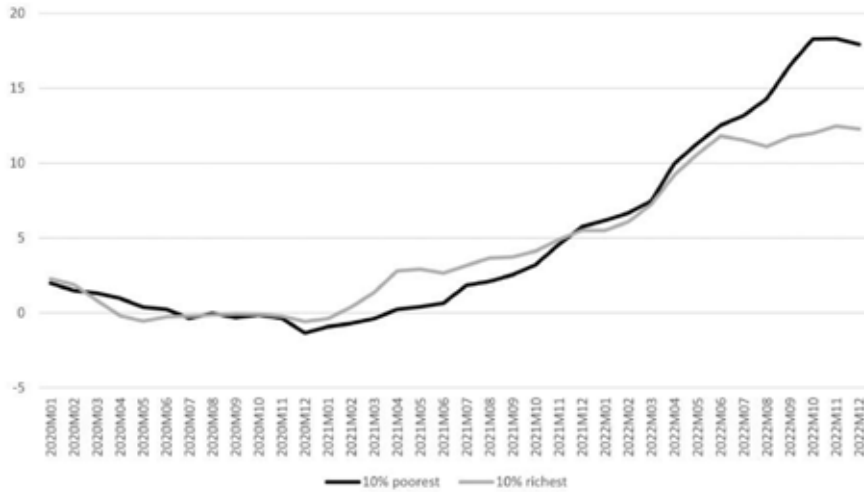
Note: Decile groups refer to the distribution of equalized household disposable income.
Sources: author's calculations are based on HBS data from 2019 and the price index for 252 COICOP classification categories published by CBS.

If we add the official inflation rate published by the CBS, it is clear that the official figure is biased towards richer households (Figure 4), as previously shown by Rubil et al. (2023).

Figure 4. Different inflation rates (year-on-year; in %)
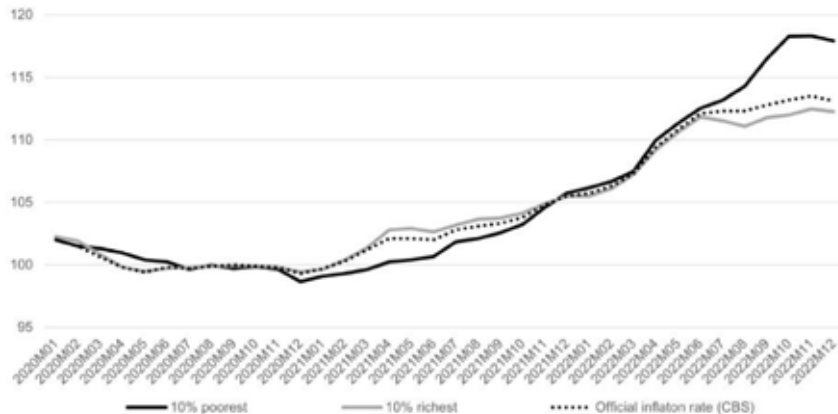
Note: Decile groups refer to the distribution of equalized household disposable income.
Sources: CBS for the official inflation rate and author's calculations based on HBS data from 2019 and the price index for 252 COICOP classification categories published by CBS for decile groups inflation rates.

Ley (2005) found that most official price indexes are procyclical—when inflation hurts the poor more, social benefit growth is lower. This means that the standard price index is a rather blunt tool for making economic and social policies when huge income inequalities are present. Besides our previous recommendations in Rubil et al. (2023) to calculate and use inflation by income decile groups for adjusting real income values and determining social security benefits and pensions, we believe our exercise has another use. With rising inflation, most countries introduced packages to help households curb cost burdens aggravated by rising prices. These measures tried to consider existing income and consumption inequalities but were often hasted, unprepared, biased to media pressures, and not based on data, e.g., recent HBS results. We propose that these and similar packages in the future rely on household-level data-driven analyses that consider measured inequalities in different gradients: size and source of income, consumption patterns, location, and other socio-demographic characteristics.

6. CONCLUSION

In this paper, we have shown that in Croatia, there are significant and rising inequalities in the inflation rate for the period 2020 – 2022. We show that some heterogeneities stem from income inequalities and differences in consumption baskets. We confirm that inflation expressed by a single number does not adequately reflect the heterogeneity of household-level inflation since, by construction, the official inflation rate better represents the inflation of higher-income households.

The main limitations of our study can be summarized as inequality of direct costs and inequality of prices. Overcoming these limitations represents possible, desirable directions for further research on inflation inequality in Croatia. First, we only assessed the level of inequality of inflation but not the inequality of direct costs caused by inflation. The direct cost of inflation equals the reduction in purchasing power that the household faces because of inflation. Because poorer households tend to save relatively less, a more significant part of their income is subject to reduced purchasing power due to inflation, even if inflation is uniform across households. This already creates inequalities in the relative cost of inflation, but if we also consider that inflation is lower for the richer, the inequalities in the relative cost of inflation increase further. Future studies could

assess the level of these inequalities, but our estimates at least represent a lower bound of significant inflation inequality in Croatia. Another limitation also points to the fact that our results could be just a lower-bound estimate of inflation inequalities. To estimate household-level inflation, we use only the variation in consumption baskets and not the actual prices that households pay. The reason is that these data are not collected in Croatia, and there is no alternative way to estimate prices. The optimal approach would be to establish a sample of households and make regular surveys coupled with scanner data.

Our results could be used to adjust social benefits, pensions, and salaries to prevent the erosion of the purchasing power of significantly poorer households. Additionally, ignoring inflation inequalities in estimates of real income inequality can lead to more optimistic results than is the case, i.e., the rate of decreasing inequalities can become overestimated. Our recommendation would be to start estimating and publishing inflation rates for decile groups of the income distribution. We believe these additional indicators would not produce significant computation efforts, and official statistical offices already collect the required data.

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APPENDIX

Figure A1. Inflation rates for income decile groups (in %)
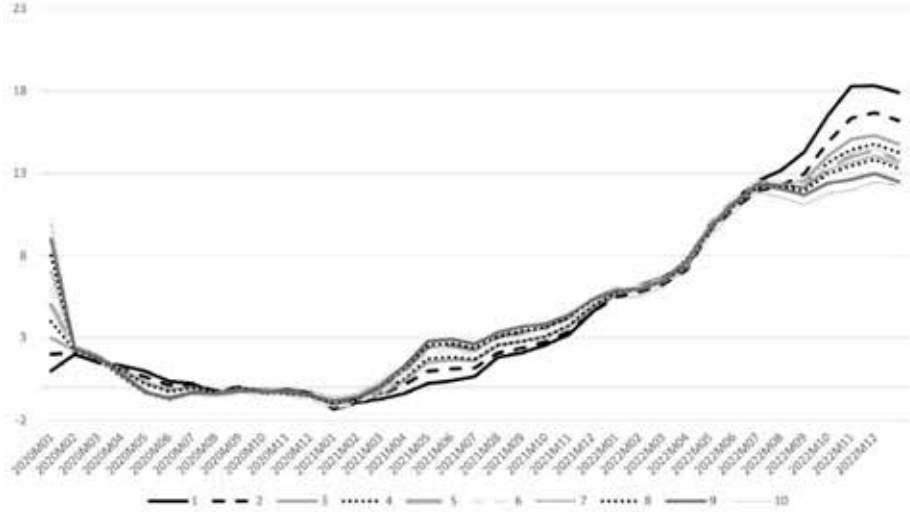
Note: Decile groups refer to the distribution of equalized household disposable income. Sources: author's calculations are based on HBS data from 2019 and the price index for 252 COICOP classification categories published by CBS.

TESTING THE APPLICABILITY OF THE DIGITAL TRANSFORMATION INDEX USING THE ALTMAN Z-SCORE MODEL[1]

Zvonko MERKAŠ, Ph.D.
International University Libertas, Croatia

E-mail: zmerkas@libertas.hr

Vlasta ROŠKA, Ph.D.
International University Libertas, Croatia

E-mail: vroska@libertas.hr

Mihael PLEĆAŠ, Ph.D.
International University Libertas, Croatia

E-mail: mplecas@libertas.hr

Abstract

The Digital Transformation Index is based on the digital maturity model and explores a company's digital transformation state. The value of the index depends on the degree of involvement of company stakeholders in business activities, the effectiveness of using new technologies and initiatives, innovating business models, sharing culture, and agility and openness in business. The Digital Transformation Index is based on the digital maturity model and indicates the degree of disruptive innovation resulting from the implemented digital transformation of the business. The paper aims to test the applicability of the Digital Transformation Index using the Altman Z-score model, one of the best-known models for predicting business difficulties. The research subject is determining the extent of applicability of the Digital Transformation Index in predicting long-term business stability. The testing was conducted on a sample

of companies within the CROBEX Index of the Zagreb Stock Exchange in the first quarter of 2023. The Z-score was calculated based on these companies' published annual financial statements for 2019 to 2021. The main research subject of the paper is to what extent the created Digital Transformation Index of a company is indicative in predicting the long-term business stability of a company. On this basis, the hypothesis is tested that companies with a high Digital Transformation Index achieve long-term business stability as measured by the high Z-score Index. The research results indicate that the Digital Transformation Index is also applicable in correlation with the results of the revised Z-score model on the Croatian market. However, it is recommended to use it as an additional, and certainly not as a fundamental indicator of business stability because the results of the implemented digital transformation of business operations affect the results of the operations in the long term, especially in case of sudden and unexpected changes in the business environment.

Keywords: *digital transformation, Z-score index, Digital Transformation Index, digital maturity model*

JEL Classification: *M21*

1. INTRODUCTION

Business digitization and digitalization processes rapidly implement various applications so that businesses can continue their business smoothly. New digital services and intelligent analytics analyzing user habits enhance daily business operations. Opportunities for business improvement exist, but they must be introduced and adopted planned, following the strategic business objectives, and making the necessary adjustments based on digital transformation processes. Each company must strive for digital maturity through digital business transformation processes. Is detecting business difficulties or forecasting bankruptcy of a business entity also related to the Digital Transformation Index, i.e., have the necessary business adaptations been carried out? Such and similar questions open research horizons and encourage various scientific discussions and research on this subject. The previous step in studies of this problem matter was achieved by defining the so-called "Digital Transformation Index based on a digital maturity model. Altman (1968) offered a Z-score model in seeking answers on the possibility of predicting upcoming business difficulties, which aroused the interest of many scientists

who sought to develop the most successful model possible that allows the testing of the probability of bankruptcy of a business entity. In bankruptcy forecasting models, researchers sought to implement several statistical and mathematical methods and include the variables that they considered significant for bankruptcy prediction, i.e., the combination of which would achieve the most accurate prediction. "Many studies were devoted to searching for the best corporate forecasting model based on publicly available data and statistical techniques" (Ooghe et al., 2009:7). The original Altman Z-score model created for the needs of the US market was originally intended for listed businesses entities within the manufacturing sector. A later revision of the original model constructed a Z'- score model (1983) for non-listed business entities and a Z"- score model (1983) for analyzing business entities outside the manufacturing sector. Since the academia and the private sector have positively accepted this model, the aim of this research, unlike previous research, is to test the performance of the Digital Transformation Index using the Altman Z-score in order not only to determine the state but also to define the cause of difficulties the analyzed company has been facing. In addition to this objective, using the original methodology, the weights of the Z-score model (while retaining the same variables) were partially adjusted to obtain a model more suitable for testing the Digital Transformation Index. Similar research related to quality testing of the conducted digital business transformation and results of business analysis using Z-score models prompted the authors of this paper to question whether the Digital Transformation Index can be used in predicting future business difficulties and to what extent its reliability can be assessed.

The research started with the hypothesis that the Digital Transformation Index is based on a digital maturity model and that it explores the state of digital transformation of a company and sets out strategic priorities and the development of comprehensive action plans aligned with the overall strategic goals of the company, depending on the degree of involvement of business stakeholders in business operations, the use of new technologies and initiatives, the innovation of business models, sharing culture, and agility and openness in business. The pre-defined Digital Transformation Index is based on a digital maturity model (Mercer, 2020). The Digital Transformation Index indicates the degree of disruptive innovation resulting from the implemented digital transformation of business operations. Digital technologies are a factor in the digital econo-

my, and various system improvements, from incremental to radical, transform the business processes, products, and services of all entities represented in the market.

Digital business models differ from traditional ones in that they are based on information rather than material resources. The topicality and relevance of this issue stem from significant investments in the digitization and digitalization of business, and according to available research, insufficient profitability increase as a result of such investments. The "Digital Croatia until 2032" Strategy in the next decade "assumes the use of advanced technologies such as 5G/6G, artificial intelligence (AI), machine learning, cloud computing, Big Data technology, and blockchain technologies in the public and private sectors, but remains open to the implementation of some future disruptive technologies that will occur in the observed period" (Strategy, 2022). Applying these advanced technologies will enable better processing and use of data which, in turn, will contribute to efficiency in the operations. Managers, aware of the need to apply new technologies but often facing rapid changes, do not know when and how to initiate and implement the necessary changes. Change management has become challenging due to employee resistance, lack of strategy, organization rigidity, and lack of critical resources. The exponential development of technology and innovative solutions require rapid business transformation. The focus on service users remains the primary objective of any change. Adapting a business model that ensures business sustainability and greater customer satisfaction is the most crucial task of digital business transformation.

How the use of the degree of the implemented digital business transformation in a company can determine and predict potential difficulties in the future functioning of the company is explored in this paper; this is verified by using the generally accepted Z-score model. By measuring the Digital Transformation Index in several selected companies, the intention is to verify the implemented model and the correctness of the measurement.

The aim of the research is, therefore, to establish the extent of business stability based on the need for digital business transformation, i.e., to test the extent to which the degree of effectiveness of business model adaptation to user needs and habits through a digital transformation influences the prevention of business difficulties in the future.

The research aims to determine the extent to which digital business transformation and the resulting Digital Transformation Index influence the necessary adaptation of businesses to new conditions.

The Digital Transformation Index will be tested in the paper on selected companies in Croatia using the Z-score model. Knowledge from the existing scientific literature is used in the paper, and the compilation and description methods display previous research. The methods of synthesis and classification define the performance of the Digital Transformation Index, which is tested by the inductive method on selected companies.

The paper answers the question of the degree to which business operations of companies are digitally transformed and to what degree they must be transformed to avoid future business difficulties. How to determine a company's digital maturity level, and what are the necessary steps to make a company digital? To what extent have companies advanced in digital competency, and has this affected Z-score value, i.e., the development of business competitiveness in the global business environment? How do current market regulations, burdened by paternalistic standards, paralyze the use of new technologies (including the use of cryptocurrencies and the creation of new blockchain-based crypto domains) and slow down the creation of digitally mature companies seeking to adopt new technologies in order to develop a stable business continuously?

The main research question is to what extent the created Digital Transformation Index of a company is indicative in predicting the long-term business stability of a company, and the hypothesis that companies with a high Digital Transformation Index achieve long-term business stability as measured by a high Z-score index will be tested in the paper. The paper aims to test the applicability of the Digital Transformation Index using the Altman Z-score model, i.e., to determine to what extent is the Digital Transformation Index applicable in predicting long-term stability in business operations. The total tested sample in the CROBEX Index of the Zagreb Stock Exchange consisted of 16 business entities, which was observed from 2019–2021. The tested sample consisted of business entities that did not belong to the manufacturing sector, and Altman's revised Z-score model was used in the research. In addition to testing the performance of the Digital Transformation Index, the weights of the Z-score model were adjusted in the paper by applying a multiple-discriminatory analysis to

obtain a model that will be more suited to the analyzed Croatian market. Due to multicollinearity in the Digital Transformation Index, not all index variables were retained in the model in this research.

2. DIGITAL BUSINESS TRANSFORMATION INDEX

Using an overview of analyzed digital maturity models (Kruljac & Knežević, 2019), a digital business transformation index based on five digital maturity areas was defined (Merkaš, 2022): user treatment, strategy development, use of technology, development of business processes, culture, people, management style, and management organization. Each area is associated with factors that significantly influence the state and development of a particular area.

The development of the segments of the five areas is the basis for the phases of the digital maturity model in which a particular segment is found: insufficient, basic, defined, advanced, and optimal. Each phase is represented by an appropriate index to simplify the model.

Index formation is based on (Bogner et al., 2016) scoring models for individual factors containing relevant questions requiring an optimal degree of implemented business digitization and digitalization in defined test areas. Therefore, in the segment of testing the degree of business automatization, the manner of carrying out the process has been established (manual, automated, regulated only). For calculating the Digital Transformation Index, it is necessary to review the impact of individual factors and link them to the desired effect (Merkaš, 2022). The operationalization of the actual implementation of activities by each factor is assessed to the extent of their realization in a particular area (not planned; planned; realized). At the same time, their impact and the effectiveness of their implementation are assessed. The analysis of each factor is based on increased productivity, availability, or customer satisfaction. The degree of realization of each activity is assessed (not realized; small change; significant change). This determines the achieved change resulting from the digital business transformation and the organization's current digital maturity through the Digital Transformation Index. The state of digital transformation of companies was assessed on a scale from 1 to 100. In this process, each organization, regardless of its insufficient level of digital maturity, considering its very existence and continuous operations, starts at least with index 10. Also, the rapid development of technology and the need for constant adaptation effec-

tively prevent any organization from being rated optimal or indexed to 100. The Digital Transformation Index generally ranges from 10 to 90. Each factor was evaluated by the Likert scale from E to A, with the "E" rating being insufficient and the "A" rating being the optimal state of an individual factor, from the level of the above-described degree of automatization or realization of an individual activity. Depending on the assessment of factors (according to the representation of ratings in a segment), each of the segment's ratings can range from two (insufficient) to 20 (optimal). The total sum of these segments makes a Digital Transformation Index based on the described digital maturity model.

If necessary, new technologies are introduced through digital business transformation processes, and the existing business, organizational, and management model is changed. The process follows the developed digital transformation strategy until management capacities become technologically fluent, i.e., capable of introducing organizational models that enable the application of new technology. In this case, an increase in digital maturity comes after implementing digital business transformation through the targeted optimization of the share of transactions with users and suppliers through digital channels, as well as the advanced use of analytics and the establishment of an appropriate management framework.

Based on the conducted assessment, organizations can be classified (Merkaš, 2022) according to the value of the Digital Transformation Index into companies that, considering their activity, can be described as:

- Leaders (high degree of automatization and realization of value chain automatization with carried out self-regulation of manufacturing processes and significant contribution of digital maturity in corporate performance);
- Participants (partially automated processes and over-average integrated manufacturing processes with no significant contribution of digital maturity in corporate performance)
- Technologists (high degree of business automatization but average level of value chain automatization and implementation of self-regulated manufacturing processes, with high costs but low contribution of digital maturity to corporate performance)
- Traditionalists (remain in their existing structures and processes as long as customer satisfaction is demonstrated without the contribution of digital maturity to corporate performance).

In this way, the Digital Transformation Index, resulting from the change in the state of the digital maturity model, passes through phases in which the index of up to 20 describes insufficient transformation, up to 40 fundamental transformations, up to 60 theoretically required, i.e., defined transformation, up to 80 advanced transformations, and up to 100 optimal transformations.

3. Z - SCORE INDEX

We know with certainty from numerous research over the past decade that many factors related to business digitalization lead to financial success. Research shows a strong link between digitalization status and income growth, explicit links are evident, and various success factors are described. First, it concerns sales automation, data-driven decisions, and new digital products and business models. Thus, the link between digitalization and margin growth is often clearly visible, as well as the correlation and the clear criteria determining success. The most important success criteria are process automatization, cloud technology for cost reduction, and a more favorable cost structure of digital business models.

The Altman Z-score model is intended to predict business difficulties, i.e., the bankruptcy of companies. Since the creation of the first model in 1968 and all its versions, the model has been explored, tested, and accepted worldwide.

$$Z = 1.2\,X1 + 1.4\,X2 + 3.3\,X3 + 0.6\,X4 + 1.0\,X5$$

The variables in the first model are defined as follows:
- $\quad$ X1 - working capital/total assets
- $\quad$ X 2 retained earnings/total assets
- $\quad$ X3 profit before interest and taxes/total assets
- $\quad$ X4 market value of the company/carrying amount of total liabilities
- $\quad$ X5 sale/total assets

If the total Z-score is below 1.81, companies face operating difficulties, i.e., at risk of bankruptcy, while a result above 2.675 represents healthy companies with a promising future. Companies with a Z-ratio between these two ratios represent a grey zone, i.e., they must work hard to improve their operations.

The first correction was adjusting the model (1983) for non-listed companies. Accordingly, variable X4 was adjusted, the variable's numerator contains

the carrying amount of the equity instead of the market value, and weightings have also been adjusted. The second model is in the following form:

$$Z' = 0.717\ X1 + 0.847\ X2 + 3.107\ X3 + 0.420\ X4 + 0.998\ X5$$

In the second model, the total Z-score below 1.23 denotes companies facing business difficulties, i.e., going bankrupt, while the result above 2.90 represents healthy companies.

The second model correction was in the Z"-score model (1983) intended for non-manufacturing companies. This third model is in the following form:

$$Z'' = 6.56\ X1 + 3.26\ X2 + 6.72\ X3 + 1.05\ X4$$

If the Z'-value of 2.6 and above is calculated, the company is considered stable and healthy, and if the value is 1.1, it means that the company is at risk of bankruptcy.

Altman, Haldeman, and Narayan (1977) developed a Zeta model. The authors expanded the Z- model. The sample for this research consisted of 53 unsuccessful companies, of which 29 were manufacturing and 24 trading companies, and 58 successful companies out of which 32 were manufacturing and 26 were trading companies. The final ZETA model consists of the following seven variables:

- Return on assets — profit/total assets
- Stability of earnings
- Profit/total interest paid
- Cumulative profitability — retained earnings/total assets
- Liquidity — Total current assets/total current liabilities
- Capitalisation — equity/total equity
- Company size — measured by total company assets

The accuracy of the ZETA model is 96% for a year before bankruptcy and up to 70% for up to 5 years before bankruptcy.

Altman, Hartzell, and Peck (1995) developed the Emerging Market Score Model (EMS). The adapted model is in the following form:

$$EMS = 3.25 + 6.56\ X1 + 3.26\ X2 + 6.72\ X3 + 1.05\ X4$$

If the EMS score is 4.35 and below, the company faces bankruptcy; a score of 5.85 and above means the company is stable.

Altman (Altman & Izan, 1982) expanded his research to studying bankruptcy indicators of Australian companies. In this research, accounting financial indicators were supplemented by industrially significant variables, as well as in Platt and Platt (1990). However, there is always the issue of how to ensure consistency and timeliness of industrial indicators.

Belak and Aljinović Barać (2008) created the BEX Index – Business Excellence Model, which determines the overall business excellence of companies. The model has been adapted to the Croatian market because it was created following the results of Croatian companies listed on the capital market. The model is in the following form:

BEX = $0.388\ ex_1 + 0.579\ ex_2 + 0.153\ ex_3 + 0.316\ ex_4$

The variables in the BEX model are defined as follows:

Ex1 = profitability = EBIT/assets

Ex2 = value creation = net operating profit/(equity x capital cost ratio)

Ex3 = liquidity = working capital/assets

Ex4 = financial strength = 5 x (net profit + amortisation + depreciation)/ total liabilities

Given that the BEX model serves to determine business excellence, the results of the model are more elaborated. If the result is higher than 6, it means that the company is a world-class candidate, and if the result is higher than 6 for four consecutive years, it can be concluded that the company classifies as world-class. A negative BEX Index means that the company operates poorly, is threatened, and needs to be restructured and improved; otherwise, it is at risk of bankruptcy. Boshkoska and Prisagjanec (2017) use the BEX model to develop software for the calculation and visual presentation of the business excellence of companies in Macedonia. Among all models for predicting business difficulties, the Altman Z-score model is the most popular and applied in practice (Alareeni & Branson, 2013), (Hussain et al., 2014) in Italy (Celli, 2015). In their papers, Janda and Rakicova (2014) compare bankruptcies in the Czech Republic, Serbia, Slovakia, and Croatia from an economic and legal perspective. Based on international studies, the authors conclude that bankruptcy proceedings have undergone significant changes and improved the adoption of new laws in all four countries.

Altman et al. (2014) investigated the application of the Altman Z-score model globally through an overview of 33 scientific papers. They concluded that

the Z-score model produces extraordinary effects in the international context. Altman (2018) states that, based on numerous published studies using the Z-score model, it can be concluded that Z-score is a reliable and easily applicable tool for forecasting the bankruptcies of companies.

There are numerous papers by domestic authors in Croatia who analyzed existing models, developed new models, or tested world models on Croatian companies such as Novak (2003), Novak and Crnković (2007), Ivičić and Cerovac (2009), Pervan, Pervan and Vukoja (2011), Šarlija and Jeger (2011), Pervan and Kuvek (2013), Keglević Kozjak, Šestanj-Perić and Bešvir (2014), Šverko Grdić, Krstinić Nižić and Mamula (2017), and Bogdan, Bareša, and Haina (2019).

Altman's Z-score was used because it uses the book value instead of the company's market value due to the ever-present liquidity problem in Croatia (Bogdan et al., 2019). Based on the obtained results, the authors concluded that Altman's Z"- score should not be recommended as a fundamental indicator for forecasting bankruptcy on the Croatian market but that Z"-score provides better forecasting options than their adjusted model.

Multinational corporations have assisted the successful restructuring of industrial companies in the most developed transition countries through direct foreign investment (Buturac, Lovrinčević & Teodorović, 2004). However, these foreign investments did not produce the desired effects in Croatia. Labor-intensive sectors lose the positions they used to have, and industries based on R&D activities have been developing rapidly under the influence of globalization. Croatia is an interesting case that has not met initial expectations, especially in industrial development (Vojnić, 2000; Vojnić, 2003, according to Teodorović & Butorac, 2006).

In their research, Teodorović and Butorac (2006) found that, out of 22 processing industry sectors, 8 recorded a decrease in production, while 14 recorded an increase in 1993–2004. Manufacturing of food and beverages, chemicals, and chemical products takes the largest share of the total gross value added of the industry.

Companies that best represent Croatian entrepreneurs are the companies included in the Zagreb Stock Exchange CROBEX Index. The CROBEX can consist of 15 to 25 shares. Currently, CROBEX consists of 18 companies, two of which are financial institutions, with a value of 2,247.05 (on 14/03/2023).

When selecting the shares to be included in the composition of the CROBEX Index, only shares listed on a regulated market that were traded in more than 75% of the total number of trading days in the six months preceding the audit are considered. The ranking of each share is determined based on two criteria (ZSE, 2023: 1): "1. Share in free-float market capitalization 2. Turnover share generated in the book of offerings in the six months preceding the audit. Each of the above criteria is attributed a weight of 50%, the mid-share or the weighted market share is calculated, and the shares are ranked according to the weighted market share".

The sample of the analyzed companies consists of 16 nonfinancial companies; Figure 1 shows the structure of the activities of the analyzed companies in CROBEX. The activities are classified into five groups. The manufacturing activity is predominant in the sample at 31%, followed by the activity of hotels and accommodation and various service activities at 25% each, the maritime transport of goods at 13%, and the trade activity at 6%.

Chart 1. Structure of Activities of CROBEX Companies
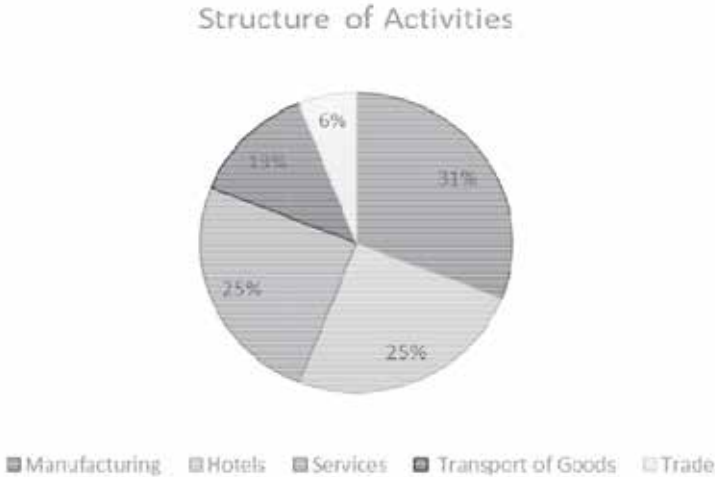
Source: Authors' analysis according to data from the Zagreb Stock Exchange

The original Z-score model is used in the research, with a slight adjustment of variable X2. The authors opted for the original model because only the original model contains the market value of the companies. In US companies, the result of the financial year in the profit and loss account is immediately allocated

to the share that is distributed to shareholders and to the portion that remains in retained earnings and is thus shown in the balance sheets. In Croatia, the financial year's result is shown in the balance sheet in the part Capital and Reserves, and the ranking is carried out in the year following the year in which the business result was achieved. Therefore, the retained earnings were corrected in X2 for the result of the financial year left by the decision in retained earnings.

Chart 2 shows the trend of the average Z-score of companies in the CROBEX Index.

Chart 2. Average Z-Score of CROBEX Companies
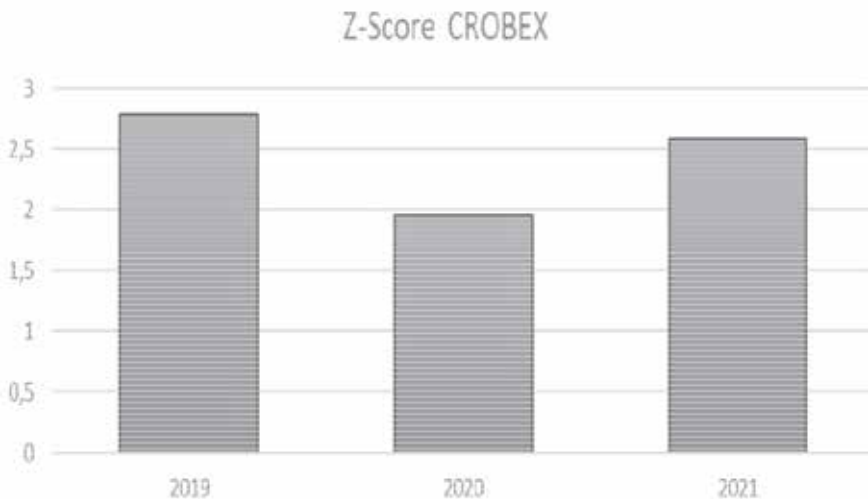
Source: Authors' analysis according to data from the Zagreb Stock Exchange

Chart 2 shows that the average Z-score in 2019 was 2.72, and companies are in a safe business area (> 2.675). In the COVID year 2020, Z-score was 1.96, which means that companies are in the grey zone, which was to be expected. In 2021, the average Z-score improved to 2.59. Although the result is still in the grey zone, it is close to a stable business limit.

Chart 3 shows the average Z-score of companies in the CROBEX Index by Z-score zones. Chart 3 shows that 63% of the analyzed companies ran stable and prosperous operations in 2019, 25% in 2020, and 38% in 2021. The COVID year 2020 has left a mark on the results, and 50% of the analyzed companies entered the problem zone. However, in addition to the government's economic

and fiscal measures, companies managed to survive the first COVID year, and the number of companies facing difficulties decreased to 38% in 2021.

In their research, Roška and Blažeković (2020) investigated by using the BEX Index whether Croatian agricultural and manufacturing companies listed on the stock exchange found a way to successful business activities, comparing the results from 2015 to 2018 with the results from 2007. Based on the research, they confirmed that agricultural and manufacturing companies have not yet managed to find their way to a successful business but that many companies have recorded significant progress. Unlike the recovery of companies after the financial crisis of 2007/08, the recovery from the COVID crisis has been faster with the support of the Government, and 38% of the analyzed companies are stable and were operating successfully in 2021.

Chart 3. Average Z-Score of CROBEX Companies by Zones

Source: Authors' analysis according to data from the Zagreb Stock Exchange

4. TESTING THE DIGITAL TRANSFORMATION INDEX OF COMPANIES USING THE ALTMAN Z-SCORE MODEL ON THE EXAMPLE OF COMPANIES IN CROATIA

We know with certainty from numerous research conducted over the past decade that many factors related to business digitalization have led to success-

ful financial performance. Research shows a strong link between the status of digitalization and income growth. Clear links and various success factors have been described. They are primarily sales automation, data-driven decisions, and new digital products and business models. Thus, the link between digitalization and margin growth, the correlation, and success-determining criteria are often clearly visible. The most important success criteria are process automation, cloud technology for cost reduction, and a more favorable cost structure of digital business models.

Research conducted so far indicates a strong link between the degree of digitalization and a company's financial performance. However, the question is posed as to what extent this performance can be attributed to a digital business transformation. The research shows the extent to which leading Croatian companies were digitally transformed at the beginning of 2020 and whether this was crucial for their successful operations in the coming period marked by the pandemic.

The Digital Transformation Index was tested using the Altman Z-score model to determine the correlation between digital transformation and successful business in times of crisis caused by the pandemic.

When operationalizing the measurement of the degree of digital maturity, it is necessary to consider how to objectively determine the Digital Transformation Index of a company based on its degree of digital maturity and how to test it objectively.

Using the Digital Transformation Index in 16 selected large companies in Croatia listed on the Zagreb Stock Exchange and participating in the creation of the CROBEX Index in November of 2022, an analysis of the state of digital transformation was made.

Each factor involved in the creation of the Digital Maturity Index was evaluated with the Likert scale from E to A, where the E-score is insufficient and A represents the optimal state of a particular factor, i.e., level of automatization or realization of a particular activity:

The analysis of the state of digital transformation (shown in Chart 4) has shown that all digital technologies and management methods currently significant for the economy have become a competitive advantage for digital leaders. The analysis includes using digital business models, particularly data-driven

and artificial intelligence-driven platforms and models. The impact of the transition from linear business models to platforms is a significant indicator of digital transformation. Changes in the business operations of economic entities are not a coincidence but a result of considerable investments in R&D, proper management methods, and a top business model.

Chart 4. How to Assess the Areas and Factors of the Digital Maturity Model

Evaluation of area states – according to factor scores from 1 to 20

Factor state evaluation – expert evaluation using the Likert scale from D to A

Business strategy	Culture, people, organisation	Customer relations	Implemented technology	Processes and operations
Brand management	Lean culture	Customer engagement	API platform	Agile management
Strategic management			Data analytics	Project management
Investment share in business financing	Leadership and management		Digital security	Automated resource management
Role in the market		User experience	Internet of things	Real-time analytics
Innovation	Workforce		Artificial intelligence	Smart processes
Relations between organisation's stakeholders	Talent management	Customer trust and perception	Robotics	Use of crypto currencies
			Blockchain and crypto domains	

Source: *Merkaš (2022)*

As the first segment, the business strategy indicates the importance of transforming management and business planning. Culture, people, and organization are the second segment of the digital transformation map. It is not about how to change jobs due to the digital transformation, but how to take employees with you during the transformation and offer them an environment that allows them to work on the issues and challenges of the digital future. The relationship with users explores the level of customer engagement, their user experience, and the achieved trust and perception. The implemented technology influences the choice of business models. Generally, we distinguish between three types of digital business models: platforms, data-driven and artificial intelligence-driven models, and digital extensions of analog models. Platform models may classify into transaction platforms and data/IoT platforms. While transaction platforms manage data-driven interactions between external suppliers and customers, data/IoT platforms provide infrastructure for data sharing and analysis

between companies for developing data-driven business models. Data-driven and artificial intelligence-driven business models are divided into service, data products, and data-driven production. Models as a service convert products into intelligent IoT services. Data products monetize the product or a characteristic of the product based on usage data. Data-based manufacturing creates a product from customer behavior.

However, companies often start their digital transformation by adding digital components to their analog models. Options include automated product creation or service provision, i.e., digital sales. The established processes and operations enable development from a physical product to a model in which equipment becomes a service. The first step is to add additional services, such as purchasing spare parts, which may be charged in the subscription model but are not yet a digital model. Additional digital services, such as remote monitoring or predictive maintenance, can be developed. Additional services allow data flow to gain insights from a machine or system. The third step allows the transition to the "equipment-as-a-service" model. The machine is no longer sold but is made available to the customer and charged depending on the use or effect. The benefits are a much lower barrier to entry for those also seeking an increase in demand.

The results of the conducted research are presented below. The analyses presented show a defined Digital Transformation Index in selected companies. The totality of areas and factors by areas well reflects all characteristics of the digital maturity of companies. Therefore the calculation and presentation of the situation are relevant for the presentation of the Digital Transformation Index of the analyzed companies. Considering that the data were collected from publicly available sources and through interviews and surveys, the data collected cannot be presented individually per company.

Whether there is a correlation between digital transformation and successful business operations in times of crisis caused by the COVID-19 pandemic has been analyzed by testing the hypothesis that reads:

H: *There is a positive correlation between digital transformation and successful business operations in times of crisis caused by the COVID-19 pandemic.*

The hypothesis was tested by testing three auxiliary hypotheses:

PH1: *There is a positive correlation between the Digital Transformation Index and the Altman Z-score for 2019.*

PH2: *There is a positive correlation between the Digital Transformation Index and the Altman Z-score for 2020.*

PH3: *There is a positive correlation between the Digital Transformation Index and the Altman Z-score for 2021.*

The hypothesis is deemed verified if all three auxiliary hypotheses are verified. Auxiliary hypotheses were tested by regression analysis, and the significant criterion $\alpha = 0.05$ has been determined.

The results of the regression analysis that tested the auxiliary hypothesis PH1 are presented in Table 1. Based on the value of *p-Value* = 0.0140, because it is lower than the significance criterion $\alpha = 0.05$ selected in the analysis, it is concluded that the correlation between digital transformation and Altman Z-score for 2019 is statistically significant. The positive value of variable $X =$ 4.6464 shows a positive correlation. The fact that the correlation is statistically significant and positive leads to the conclusion that the auxiliary hypothesis PH1: *There is a positive correlation between the Digital Transformation Index and the Altman Z-score for 2019* to be accepted.

Table 1. Regression Analysis of the Digital Transformation Index and the Altman Z-Score for 2019

Multiple R	0.6003	Pearson correlation coefficient
R^2	0.3603	Coefficient of determination
Adjusted R^2	0.3146	
Standard Error	12.6278	
Observations	16	

ANOVA				
	df	*SS*	*MS*	*F*
Regression	1	1257.4494	1257.4494	7.8856
Residual	14	2232.4545	159.4610	
Total	15	3489.9038		

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	59.4459	6.1536	9.6603	1.4308 E-07
X	4.6464	1.6546	2.8081	0.0140

Source: Authors' research and analysis

The value of the variable *Multiple R* = 0.6003, i.e., the Pearson correlation coefficient, indicates that the correlation strength is moderately strong. The value of variable R^2 = 0.3603, i.e., the Coefficient of determination, indicates that the regression model describes 60.03% of the variance of change in business performance concerning the Digital Transformation Index.

The results of the regression analysis used to test the auxiliary hypothesis PH2 are presented in Table 2. Based on the value of the variable *p-Value* = 0.0005, because it is lower than the significance criterion α = 0.05 selected in the analysis, it is concluded that the correlation between digital transformation and the Altman Z-score for 2019 is statistically significant. The positive value of variable X = 7.3303 shows a positive correlation.

The fact that the correlation is statistically significant and positive leads to the conclusion that the auxiliary hypothesis PH2: *There is a positive correlation between the Digital Transformation Index and the Altman Z-score for 2020 is* to be accepted. The value of the variable *Multiple R* = 0.7694, i.e., the Pearson correlation coefficient, indicates that the correlation strength is moderately strong. The value of variable R^2 = 0.5920, i.e., the Coefficient of determination indicates that 59.20% of the variance of change in business performance concerning the Digital Transformation Index is described by the regression model.

Table 2. Regression Analysis of the Digital Transformation Index and the Altman Z-score for 2021

Multiple R	0.7694	Pearson correlation coefficient		
R^2	0.5920	Coefficient of determination		
Adjusted R^2	0.5628			
Standard Error	10.0854			
Observations	16			
ANOVA				
	df	*SS*	*MS*	*F*
Regression	1	2065.8887	2065.8887	20.3105
Residual	14	1424.0151	101.7154	
Total	15	3489.9038		
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	59.9473	4.0583	14.7715	6.2343E-10
X	7.3303	1.6265	4.5067	0.0005

Source: Authors' research and analysis

The results of the regression analysis used to test the auxiliary hypothesis PH3 are presented in Table 3. Based on the value of the variable *p-Value* = 9.7169 E-05, because it is lower than in significance criterion α = 0.05 selected in the analysis, it is concluded that the correlation between digital transformation and the Altman Z-score for 2019 is statistically significant. The positive value of variable 7.0336 shows that the correlation is positive.

The fact that the correlation is statistically significant and positive leads to the conclusion that the auxiliary hypothesis PH3: There is a positive correlation between the Digital Transformation Index and the Altman Z-score for 2021 to be accepted. The value of the variable Multiple R = 0.8209, i.e., the Pearson correlation coefficient, indicates the strength of the correlation. The value of variable R2 = 0.6739, i.e., the Coefficient of determination, indicates that the regression model describes 67.39% of the variance of change in business performance concerning the Digital Transformation Index.

Table 3. Regression Analysis of the Digital Transformation Index and the Altman Z-Score for 2021

Multiple R	0.8209	Pearson correlation coefficient		
R^2	0.6739	Coefficient of determination		
Adjusted R^2	0.6507			
Standard Error	9.0155			
Observations	16			
ANOVA				
	df	*SS*	*MS*	*F*
Regression	1	2351.9908	2351.9908	28.9371
Residual	14	1137.9131	81.2795	
Total	15	3489.9038		
	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	56.0528	4.0694	13.7743	1.5634E-09
X	7.0336	1.3075	5.3793	9.7169E-05

Source: Authors' research and analysis

Based on the fact that all three auxiliary hypotheses have been verified, it is concluded that research hypothesis H: There is a positive correlation be-

tween digital transformation and successful business operations in times of crisis caused by the COVID-19 pandemic means that the higher level of digital transformation, the greater the business performance.

5. CONCLUSION

Users in the global business environment, interconnected by digital technology, imperceptibly communicate with each other, collaborate, connect, order products and services, monitor business processes, and actively participate in strategic development. Companies must constantly review their existing business models and find ways to differentiate effectively. Through the necessary analysis, verification of the factors of the digital maturity model, and, ultimately, determination of the Digital Transformation Index, organizations must define key steps towards an optimal digital transformation of business operations in order to achieve competitive advantages and actively use adequate digital technologies to create a market difference and pose a threat to other organizations in the industry. The digital business transformation thus becomes the best way to adapt to upcoming descriptions.

This research has shown the necessity for conducting a digital business transformation as a tool for a long-term increase in competitiveness.

The conducted research verified the hypothesis of the paper that only organizations with a high Digital Transformation Index, which have successfully implemented the processes of digital business transformation, can readily expect changes in the environment and create the necessary market competitive differences and, as leaders of change, pose a threat to other organizations based on traditional ways of doing business in their activities. Research has shown that only organizations with new business models based on business digitization and digitalization readily await upcoming disruptions and remain the leaders of market change.

Further research should show the extent of a gap in assessing the Digital Transformation Index in large, medium, and small enterprises and the extent to which factors affecting the areas of the digital maturity model should be adapted, considering the activity and timing of the necessary changes. In this way, it would be possible to assess the universality of the presented index and its daily application in the economy.

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Only organizations with a high Digital Transformation Index, which have successfully implemented the processes of digital business transformation, create the necessary competitive differences and, as the leaders of change, threaten other organizations based on traditional business practices. A long-term high Z-Score Index directly points to the implemented digital transformation in business operations. The research indicates that only organizations with new business models based on business digitization and digitalization readily await upcoming disruptions and remain market leaders with a high Z-score value. In the long run, From the calculation of the correlation between the Digital Transformation Index and the Z-Score Index of the analyzed companies, it can be concluded that there is a statistically significant correlation between digital business transformation and the resilience of companies to environmental challenges. In the years of the pandemic, the correlation increased, suggesting that business digitalization contributed to increasing companies' resilience to crises and challenges. However, correlation is not a good indicator that business digitalization fully demonstrates the resilience of companies to challenges in the environment.

Further analysis and monitoring of the impact of digital transformation on business operations and companies are needed to understand better how digitalization contributes to the resilience of companies to challenges in the environment. The research results further show that the Digital Transformation Index is also applicable in correlation with the results of the revised Z-score model on the Croatian market. However, it is recommended to use it as an additional and not as a fundamental indicator of business stability because the results of the implemented digital business transformation affect the results of operations in the long term and not in the short term.

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FINANCING ECO-FRIENDLY AND SMART URBAN PUBLIC TRANSPORT: A COMPARATIVE ANALYSIS BETWEEN GERMAN-SPEAKING COUNTRIES AND BOSNIA AND HERZEGOVINA[1]

Lejla LAZOVIĆ-PITA, Ph.D.
University of Sarajevo

E-mail: lejla.lazovic@efsa.unsa.ba

Jasmina MANGAFIĆ, Ph.D.
University of Sarajevo

E-mail: jasmina.mangafic@efsa.unsa.ba

Mario SITUM, Ph.D.
University of Applied Sciences Kufstein

E-mail: mario.situm@fh-kufstein.ac.at

Giuseppe SORRENTINO, MA
University of Applied Sciences Kufstein

E-mail: giuseppe.sorrentino@fh-kufstein.ac.at

Abstract

Out of 17 set goals, the UN 2030 Agenda for Sustainable Development in goal 11 defines the significance of sustainable cities and communities, giving priority to, inter alia, sustainable and expanding urban public transport. This actual and attractive topic increases the academic interest and research regarding different aspects of financing eco-friendly, smart and therefore sustainable

urban public transport in cities and communities worldwide, but such research is parsimonious in the European transition countries. The research design employed mixed methods so that the gathered information could be compared and evaluated in addressing each of the research questions using different data sources: publicly available documents and semi-structured interviews regarding urban public transport conducted with key stakeholders in three German-speaking countries (Austria, Germany and Switzerland) and in the capital of Bosnia and Herzegovina (BiH), Sarajevo. After conducting 14 semi-structured interviews with representatives from the German-speaking stakeholders and 11 stakeholders in Sarajevo, the objective of the study is to answer two research questions: firstly, were stakeholders involved in financing smart mobility projects and what were the sources of such financing, and secondly, who needs to be involved in decision-making on financing smart city projects? Even though respondents agree that most financing in German-speaking countries as well as in BiH, ought to come from public sources of financing (budgets at different levels of government and EU-funded grants), significant differences exist in recognition of new, innovative, and alternative sources of financing that were recognized in German-speaking countries to a certain extent and not in BiH. These mainly relate to crowdfunding sources, green crowdfunding as possible PPP. The stakeholders in all countries agree that subcentral governments' representatives are the key stakeholders in the decision-making process regarding financing smart city/mobility projects, together with citizens and the private sector. Based upon the comparative analysis, our results indicate several financial, social and environmental lessons-learned and critical points that should be considered in the Bosnian case based on German-speaking countries' experiences.

Keywords: *eco-friendly, smart mobility, financing, urban public transport*

JEL Classification: *H41, H42, H61, L91, R42*

1. INTRODUCTION

Several strategic documents worldwide have emphasized the significance of transport as a critical objective. The United Nations (UN) Agenda for Sustainable Development defines 17 Sustainable Development Goals to be reached by the year 2030 worldwide. Goal 11, titled *"Sustainable cities and communities,"* deals with several aspects of urban living, from adequate housing, air pollution in the cities, and adequate urban infrastructure to urban waste management.

Since the UN estimates that by 2050, 7 out of 10 people will likely live in cities, the pressure to fulfill all the envisaged objectives represents a challenge for local governments globally. Currently, cities are places where 80 percent of the world's GDP is created with the opportunity cost of the highest greenhouse gas emissions (70 percent globally, United Nations, 2022). Under such circumstances and the forecast that by 2030, annual passenger traffic will increase by 50 percent, putting additional pressure on urban infrastructure and urban public transport. Most recent data from 2020 (United Nations, 2022) estimates that from 1,510 cities worldwide, only about 37 percent of urban areas are served by public transport, which makes slightly more than half (52 percent) of the worldwide urban population being provided with convenient access to public transport.

Providing efficient urban transport ought to bring several positive outcomes to local communities worldwide, from reducing urban air pollution to providing access to other public goods and services (health, education, employment, etc.). The accompanying problem of climate change is becoming more and more vacant at present (Delitheou et al., 2019). In the most recent academic literature, several terms are associated with urban public transport: eco-city or smart city. The term eco-city is closely interwoven with the smart city because implementing green energy and smart data-driven technology offers the possibility of achieving both environmental policy goals more efficiently, faster and through sustainable development by lowering energy consumption and pollution reach (Bibri, 2020). Hence, the academic solutions for the issues mentioned above might be in the implementation of smart, eco-friendly cities through economic restructuring and initiation of developments in urban intelligence management to be able to counter the problems outlined above (Li et al., 2015).

In addition, the European Union Green Deal 2019 puts transport as one of the critical policies into the spotlight. The ambitious EU criteria for greenhouse gas emission reduction in transport by 2050 of 90 percent is required to reach the climate neutrality objective. The objective of "*Accelerating the shift to sustainable and smart mobility*" defines several areas the European Commission plans to tackle in the coming years. These relate to greater investments into multimodal transport and smart traffic management systems, modifications in the Energy Taxation Directive, installations of about 1 million public recharging and refueling stations by 2025, and, most importantly, making city transport drastically less polluting, addressing the emissions, urban congestion, and improved public

transport (European Commission, 2019). In Europe, academic research evaluating best practices and smart, eco-friendly city financing has increased in the last fifteen years. For example, such research for medium-sized cities has already been conducted in the works of Griffinger et al. (2007) and Blanck & Ribeiro (2021), to name a few. After setting a benchmark in terms of best practices implemented in the EU and across the world, it becomes inevitable to evaluate the efficiency of the very backbone of every (smart) city –its transport services (Gudmundsson et al., 2005; Stone et al., 2012).

Hence, the significance of smart and sustainable transport, especially urban public transport, has been recognized as a critical determinant in reaching sustainability goals worldwide (Curiel-Ramirez et al., 2020; Gallo & Marinelli, 2020). However, adequate financing of urban public transport needs to be analyzed to reach any of the envisaged objectives. So, the purpose of the study is to answer two research questions: firstly, were stakeholders involved in financing smart mobility projects, and what were the sources of such financing? Secondly, who needs to be involved in decision-making on financing smart city projects? By employing the mixed methods design in evaluating the research questions, we analyze and validate publicly available documents with results gathered from semi-structured interviews regarding urban public transport conducted with key stakeholders in three German-speaking countries (Austria, Germany and Switzerland) and the capital of Bosnia and Herzegovina, Sarajevo.

The article is organized as follows: after the introduction, the paper is divided into four parts: a brief literature review, research design and methodology, the results and the discussion of financing eco-friendly urban public transport in the German-speaking countries, the results and the discussion of financing eco-friendly urban public transport in Sarajevo followed by comparative analysis and conclusions.

2. LITERATURE REVIEW ON FINANCING URBAN PUBLIC TRANSPORT

Several aspects of the vast available literature on financing smart and eco-friendly cities and their transport in the European context have already been highlighted (Gudmundsson et al., 2005; Stone et al., 2012). Hence, the literature that deals with eco-friendly, urban public transport is growing, and the basic Web of Knowledge all-fields research with two keywords of Public

transport and Eco-Friend* reveals some 89 results. However, further research into the Web of Knowledge in all fields by two key words: finance* and eco-friend* urban public transport* reveals only two results from the engineering sciences. Bartłomiejczyk and Połom (2016) focus on saving electric energy in public transport through eco-friendly solutions in urban municipal transport (trams, trolleybuses, light rail and underground). Based on extensive measurement research conducted in the Gdynia trolleybus network, the results of PKT Gdynia's experiences in energy consumption reduction are shown as ready to use. The article also highlights the impact of practical verification of energy reduction methods in electrified transport.

Similarly, by focusing on necessary improvements in eco-friendly solutions in urban transport, Kłos and Sierpiński (2021) identified and classified the parameters of a model of urban sharing services. After a detailed literature review on the parameters which describe and affect the use of sharing services and collective public transport, the main findings are classified and grouped into the following travel parameters: location (four parameters), demographics (two parameters), traveling (six parameters), economy (four parameters), quality (eight parameters), lifestyle (six parameters) and related preferences of the traveling population. Responsible and active management of financial resources is crucial to efficiently provide any public good or service, including urban public transport. The terms financial performance and financial analysis are in most financial literature alternatively used. We understand that the financial performance concept should be broader than the financial analysis, which may be verified in the world's giant Web of Knowledge scientific repository. Since public companies mainly operate urban public transport, most academic research today evolves around the financial (and sometimes non-financial) analysis of public companies (financial and non-financial) being or planning to become publicly listed companies.

Under such analysis, data is usually taken from the stock-exchange listed companies, making the entire analysis significantly easier for comparison (Guo et al., 2015; Zhang & Cai, 2018; Susilawati, 2019). The research related to the financial performance of any public companies in BiH, including urban public transport, is parsimonious. With the search result of the financial performance and public companies and BiH, we obtained one result that analyzes non-financial state-owned enterprises (SOEs) in 11 post-socialist Central-Eastern European (CEE) countries for 2014 and 2015. The results indicate the state's

dominant role in the energy and transport sectors in the CEE by share and financial performance of such companies (Matuszak & Szarzec, 2019: 561).

In the case of BiH, only recently, Cegar and Parodi (2019: 6) analyzed the status of public companies (state-owned enterprises) and their macroeconomic impact on the economy. Previous analysis regarding financial analyses and the performance of public companies in BiH is missing since the data was unavailable. Most recently (2019), the two BiH entity's business registration agencies have established a central registry of public companies operating in each entity. Even though this is a huge step forward, a unified registry at the level of BiH unfortunately still does not exist. Hence, evaluating the financial performance of the public companies in BiH was not possible since the entire public sector lacks transparent governance and therefore lacks accountability, transparency, and enforcement (Cegar & Parodi, 2019: 6). Under such circumstances, evaluating and analyzing the financial performance of the public companies in BiH remains challenging. The latest available data indicates that some 550 public companies operate in BiH, which inevitably affects the macroeconomic performance of BiH.

3. RESEARCH DESIGN AND METHODOLOGY

Our research design employed mixed methods approach based on an extensive desk review of currently available public documents with available databases and semi-structured interviews with 25 key stakeholders. All interviewed stakeholders demonstrably possessed specific practical and experiential knowledge (in the sense of duration of professional experience, their position and relation to the topic area, etc.) in the relevant research field so that it can be deduced that their statements allow meaningful and action-guiding conclusions for answering the research questions (Bogner et al., 2014: 13). Semi-structured interviews were conducted online and in-person at the same time in German-speaking countries and in Sarajevo over 20 days in April 2023. Each semi-structured interview lasted up to one hour. 14 semi-structured interviews were conducted in German-speaking countries (Austria, Germany and Switzerland) with the following structure:
  • twelve critical stakeholders from the private sector
  • two critical stakeholders from the public sector

11 semi-structured interviews were conducted in Sarajevo, Bosnia and Herzegovina (BiH) with the following structure:

- three critical stakeholders from the private sector
- three key stakeholders from the public sector
- two international consultants and
- three local consultants that provide technical support during an ongoing mobility project in Sarajevo.

The structure of the interview guideline combined questions from various academic journals and studies about sustainable, eco-friendly, and smart mobility. The questions blended several previously conducted studies and research across the world (Real et al., 2021; Oke et al., 2022; Peters et al., 2018; Finck et al., 2020; Sørensen & Paulsson, 2020) whereby the questions were adapted (where necessary) to reflect local peculiarities (Flick, 2018: 84-85; King et al., 2017: 64-66). In order to ensure the content validity and completeness of the interview guide, it was pre-tested by four experts and adapted based on their feedback (Häder, 2019: 413; Hulland et al., 2018). In the pre-testing phase, the interview was translated into the local languages and then back to English to avoid possible misinterpretation. During the semi-structured interviews, key stakeholders were asked general questions regarding eco-friendly and smart mobility. However, the focus was on two questions regarding the financing of smart mobility: firstly, were stakeholders involved in financing smart mobility projects, and what were the sources of such financing? Secondly, who do they consider needs to be involved in decision-making on financing smart city projects? The interviews were conducted in BiH in German, English and local languages and fully transcribed (King et al., 2017: 193-194). The study's main limitations may include possible response bias, recall bias, and selection bias. These limitations were mitigated by drawing on multiple sources of information, carefully designing and conducting data collection, and ensuring to include as many key stakeholders (experts) as possible (Bogner et al., 2014: 92).

4. THE RESULTS AND THE DISCUSSION OF FINANCING ECO-FRIENDLY URBAN PUBLIC TRANSPORT IN THE GERMAN-SPEAKING COUNTRIES

Strategy papers have dealt with sustainable mobility in German-speaking countries for several years. In addition to the national mobility strategies for Austria and Germany, the strategy for sustainable and intelligent mobility of

the European Union must also be considered. The transport and mobility sector in the EU is the second-largest area of expenditure for European households, contributes 5% to European GDP and employs around 10 million workers. In the vision presented, the most significant challenges in the transport sector are reducing emissions and increasing sustainability. Nevertheless, mobility should be affordable for everyone in the European Union. The main goal is to reduce 90% of emissions caused by the transport sector by 2050. This is to be achieved through the three objectives of sustainable mobility, smart mobility and resilient mobility, for which individual action plans have been developed (European Commission, 2020; Gallo & Marinelli, 2020).

For Austria, the Mobility Master Plan 2023 is available, allowing the mobility sector to reorientate to fulfill the Paris Climate Agreement. The main objective of this plan is to show ways to achieve climate neutrality, whereby the mobility transition creates a multifaceted contribution to society. It aims to improve access to mobility, noise and air pollution control, resource needs and recycling solutions, etc. In 2040, passenger transport should be distributed as follows: 22% walking, 42% motorized private transport, 23% public transport and 13% cycling. A system of indicators measures the progress toward achieving the desired goals to control the planned measures. The key points here are the creative and innovative realignment of the legal framework, the reform of mobility law and both innovations and climate protection in transport law.

Concerning the financing of the projects, several possibilities are mentioned in the Master Plan. For the financing of passenger transport, local authorities are expected to contribute. For mobility in tourism, indirect financing options such as tourism taxes or surcharges on overnight stays are proposed. From an Austrian perspective, green finance options appear to be particularly important (e.g., green leasing, green crowdfunding, green subsidy programs, etc.), which can be used individually or in combination with government support (Federal Ministry Republic of Austria Climate Action, Environment, Energy, Mobility, Innovation and Technology. 2021).

In Germany, the National Platform for the Future of Mobility was founded, which promotes the development of cross-modal and linking paths for a largely greenhouse-neutral and environmentally friendly transport system (for freight and passenger transport). Mobility should be efficient, high-quality, flexible, available, safe, resilient and affordable. A total of 6 key topics (climate protec-

tion in transport, alternative drives and fuels for sustainable mobility, digitization for the mobility sector, securing the mobility and production location, linking transport and energy use and standardization, certification, and type approval) were defined (Bundesministerium für Verkehr und digitale Infrastruktur, n.d.). In addition, the National Competence Network for Sustainable Mobility was founded as the central point of contact for sustainable mobility issues. There, actors' networks and experiences are exchanged, and expertise is contributed in order to be able to promote clean mobility in Germany. With this network, comprehensive knowledge management on the topics of urban or rural mobility, logistics, cycling, electromobility, digitization and funding opportunities were established, and network partners can find solutions there or find network partners to develop solutions (NaKoMo Geschäftsstelle im Bundesministerium für Digitales und Verkehr, 2021).

In the Swiss Transport Perspectives, it is assumed that traffic will grow in the future. It is stated that transport performance will increase by only 11%, while the population will grow by 21% by 205 (Bundesamt für Raumentwicklung, 2022). The main goal for the future of Switzerland's mobility is to make the overall transport system efficient by 2040. This means that available technologies are used optimally, fewer financial and natural resources are consumed, and thus maximum benefits are created for society. In the process, 14 strategic goals were formulated, covering the aspects of framework conditions and prerequisites, demand, supply and infrastructures, financing and environment, energy and space. Goals 8 and 9 deal with financing and state that a.) the mobility offer and the transport infrastructure should be financed cost-effectively with the available public funds and b.) the users of all mobility offers should increasingly bear the internal and external costs they cause themselves (Bundesamt für Raumentwicklung, 2017). In addition to the goals mentioned above and principles, Swiss transport policy, in general, has been aligned with European transport policy (Eidgenössisches Department für Umwelt, Verkehr, Energie und Kommunikation, 2011).

The results of the interviews are summarized in Table 2. Most public transport projects in German-speaking countries are financed through national funding and grants. Funding can come from the state itself or the individual provinces/cantons. The cities/municipalities themselves are also firmly integrated into the financing. It can therefore be deduced that the financing of public transport is shared between the state and cities/municipalities and is primar-

ily assumed by them. This finding aligns with the mobility strategies described earlier and shows that states, countries and cities/municipalities see themselves as responsible for enabling and essentially financing public mobility.

Interestingly, the respondents repeatedly mentioned private participation as another possible funding source. In some cities/municipalities, it is already used; in others, this form of financing is seen as an attractive future option. Crowdfunding was mentioned particularly frequently. Some interviewees said that, in some cases, it is challenging to implement because a) crowdfunding seems more feasible for local projects, and b) it takes a lot of convincing to get the population excited about a specific project. Only one interviewee mentioned the concept of public-private partnership (PPP) as a possible funding option for the future. This is an exciting result, as, in the past, PPP was classified as a sensible form of financing and operation, especially in transport infrastructure, because it allowed various advantages to be realized (Langhagen-Rohrbach, 2007).

Concerning the stakeholders involved in the decision-making process, it can be seen that attempts are always made to involve several groups of stakeholders. In all cases, it was stated that the city/municipality representatives must be present. These can be represented by different departments/persons. It was often mentioned that the responsible persons of traffic planning, the city administration and political decision-makers are involved in some instances. In almost all cases, community participation was also considered relevant. This can be done through citizen representatives, public events, and public discussions with citizens. Thus, an attempt is made to obtain arguments from different perspectives to develop and implement a solution accepted by most stakeholders finally.

Table 2. Summary of responses in 14 interviews in the German-speaking countries

Research qu. 1: Were you involved in financing smart mobility projects, and what were the sources of financing?					Research qu. 2: Who needs to be involved in the decision-making process on financing smart city projects?
1. Private funding (8 responses)	2. National subsidies/ grants received (11 responses)	3. EU funds/ EU projects (4 responses)	4. Loans - Municipal loans or investment loans - (2 responses)	5. Municipal budgets (9 responses)	City/municipality (14 responses), citizens (8 responses), private sector experts (3 responses), Funders (2 responses)

Source: authors.

5. THE RESULTS AND THE DISCUSSION OF FINANCING ECO-FRIENDLY URBAN PUBLIC TRANSPORT IN SARAJEVO

After BiH gained independence from Yugoslavia in 1992 and after the human, economic and infrastructural losses during the war in BiH (1992-1995), starting from 1995, BiH also obtained a new Constitution under the Dayton Peace Agreement, which organized the country as two entities, Federation of BiH (FBiH) and Republika Srpska (RS) and one district (Brčko District). The latest Census data (2013) indicates that there are 3.5 million living in BiH, and its capital is Sarajevo. Because of the new Constitution, the position of its capital city Sarajevo changed, so now Sarajevo belongs to FBiH and is one of the ten cantons in FBiH – Sarajevo Canton. Due to inter-entity arrangements between RS and FBiH, and the fact that new municipalities were formed at the inter-entity borderline (in RS, where the City of East Sarajevo is formed with six new municipalities forming the City), the territory of Sarajevo Canton now occupies 1,276.9 km^2 (Federal Institute of Statistics, 2022a: 7) which is approx. 4.9% of the territory of FBiH and 2.5% of BiH territory. Some 419,918 inhabitants live in Sarajevo Canton (Federal Institute of Statistics, 2022b, p. 13). Sarajevo Canton consists of nine municipalities where four inner-city municipalities (Centar, Stari Grad, Novo Sarajevo, and Novi Grad) from the City of Sarajevo, and the remaining five (Vogošća, Ilijaš, Ilidža, Trnovo and Hadžići) are outer city municipalities.

The urban public transport in Sarajevo Canton, which has been neglected for almost two decades, has only recently (as of 2018) started to gain the local public stakeholders' interest in necessary improvements in urban public transport. International financial institutions began the process and projects related to eco-friendly, smart and sustainable cities in Sarajevo, too, with a focus on smart mobility, for example, UNDP with its Smart City project in 2018, GIZ in 2020-2022 with its Smart Urban Mobility Plan (Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2022) or the EBRD's 2020 Green Action Plan for Sarajevo Canton (Atkins Limited, 2020). In December 2022, Sarajevo and its Sarajevo Functional Urban Area project related to public mobility became the only BiH city to become a part of the European Commission's "100 Net Zero Emission Cities" that aims to achieve 100 climate-neutral and smart European cities within a decade.

So, during 2022, the Sarajevo Canton Assembly adopted the Sarajevo Canton Development Strategy for the 2021-2027 period, which foresees investments of over two billion BAM, of which 660 million BAM is planned for strategic projects and activities related to the construction and reconstruction of public transport infrastructure. Two-thirds of the resources necessary for constructing and reconstructing public transport infrastructure (tramroad and purchasing new trams and trolleybuses) will be financed through Sarajevo Canton's budget (public funds). The rest will be financed from other sources, such as funds from the EU and other international donors, higher levels of government, municipalities, or loans from the international financial institutions operating in BiH. The measures also include investment in the improved and new infrastructure of public transport vehicles, new bicycle paths and pedestrian zones and paths, the inclusion of railways in the unique system of public passenger transport, the development of urban city logistics, as well as the construction of additional parking spaces (Sarajevo Canton, 2021; Sarajevo Canton, 2023).

Additionally, the Strategy for the Development of the City of Sarajevo for the 2021-2027 period, which was adopted in 2022, defined as one of the priorities for Sarajevo to become a smart city, which was envisaged through the establishment of Smart Hub, which would have the task of implementing projects to develop Sarajevo as a smart city, as well as opening a business center and incubator that will support start-up businesses. Also, in its strategy, the City of Sarajevo stated the need for the development of infrastructure for electric cars and other means of transportation that will reduce the use of cars on fossil fuels. In mobility, the purchase of city bicycles and e-scooters and their organizational aspects are planned (City of Sarajevo, 2022). Both strategies are harmonized with the documents of higher levels of government - the Development Strategy of the Federation of Bosnia and Herzegovina for the 2021-2027 period, as well as the sustainable development goals from the UN Agenda 2030, which Bosnia and Herzegovina together with other countries signed in September 2015.

However, the current situation regarding public transport in Sarajevo Canton/City of Sarajevo shows a gloomy picture. The overarching institution in charge of urban public transport is the Sarajevo Canton Ministry of Traffic. The Green Action Plan for Sarajevo Canton - Atkins Limited provided information about urban public transport in Sarajevo Canton, which is carried out by trams, trolleybuses, buses, minibusses, cable cars and a funicular railway operating by registered timetables. The latest available data indicates that there were

six tram lines and six trolleybus lines, 55 bus and 44 minibus lines, and one funicular rail (Atkins Limited, 2020: 20). There were 112 public and suburban transport lines in the city with a total length of 2,267km. Sarajevo also has a relatively well-developed network of taxi services in the entire area of Sarajevo, with around 669 taxis available.

Regarding bicycle use, the bicycle is mainly perceived as a recreational means of transport (Atkins Limited, 2020). Although significant progress has been made in constructing bicycle paths in recent years, the total length of 6.8 km has not yet reached the "green" reference value of 25 km (Atkins Limited, 2020: 22). The installation of new parking infrastructure should accompany the improvement of bicycle paths throughout the city. For Sarajevo, it is proposed to provide 30-50 parking spaces per km of cycling path. A similar situation is with e-scooters, whose use and parking remain unregulated.

Due to the most recent reconstruction of the tramroad, the impact of COVID-19, and a fall in public urban transport trust over the years, there has been a significant fall in the number of passengers. For example, in 2008, 112,047 passengers were transported by trolleybuses, trams and city buses, while in 2021, that number dropped to 72,171. In Table 2, we can see a falling trend in the number of passengers in urban public transport by all means of transport (trams, trolleybuses, buses) and an increasing number of registered motor vehicles and motorcycles, indicating a clear 'switch' from public transport to private motor vehicles (mostly diesel run cars) in Sarajevo Canton/City of Sarajevo.

Table 2. Number of passengers in urban public transport and number of registered motor vehicles in Sarajevo Canton, 2015-2021

	2015	2016	2017	2018	2019	2020	2021
Total passengers (000)	95,876	95,487	94,230	93,396	90,356	64,907	72,171
Trams	44,844	42,396	41,861	41,795	41,795	28,945	30,758
Buses	36,563	36,797	36,280	37,176	36,674	25,912	29,591
Trolleybuses	16,469	16,294	16,089	14,425	14,262	10,050	11,822
Total registered motor vehicles	120,981	126,554	129,690	134,191	140,679	139,169	142,663
Motorcycles	1,229	1,333	1,487	1,854	2,984	2,067	2,285

Source: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, 2022 and Sarajevo Canton Institute of Informatics and Statistics, 2022[2].

[2] available at: https://zis.ks.gov.ba/statistika?field_istrazivanja_period_value=5&field_istrazivanja_ oblast_value=9&field_godina_value=&field_mjesec_value=All, access May 12, 2023.

The average price for a single ticket for urban public transport in zone A (an area covering the City of Sarajevo) is less than 1 Euro. However, passengers still do not use urban public transport. This has been reflected in the financial statements of the two public urban transport operators in Sarajevo Canton (one public and one private). The public company provides all horizontal transport services (tram, trolleybus, bus and minibus), while the private company provides transport services by buses and minibusses only. Currently, the ticketing service between the two companies is not integrated, meaning that the ticket bought for the public company's transport service cannot be used for the private company's transport service and vice versa. So, in 2020 (latest available data), the public company has accumulated a loss of more than 100 million BAM, while the private company, as of 2021 (latest available data), has no fixed assets, making comparing the financial position challenging. The private company is 100% owned by its related parent company that operates buses and minibusses transport domestically and internationally. Regarding the research questions, the summary of responses per research question is summarized in Table 3.

Table 3. Summary of responses in 11 interviews in Sarajevo

Research qu. 1: Were you involved in financing smart mobility projects, and what were the sources of financing?					Research qu. 2: Who needs to be involved in the decision-making process on financing smart city projects?
1. Private funding (3 responses)	2. Subsidies/ grants received through projects (2 responses)	3. EU funds (3 responses)/ EU projects (1 response)	4. Loans - International financial institutions' loans – EBRD, EIB and the World Bank (3 responses) and commercial loans (2 responses)	5. Municipal budgets (4 responses)	Sarajevo Canton and City of Sarajevo (2 responses), Government of Sarajevo Canton (2 responses), municipalities (2 responses), citizens, private sector, experts

Source: authors.

As indicated in Table 3, key stakeholders in Sarajevo consider five types of financing as options: private funding, subsidies received through projects, EU funding and EU projects, loans - either domestic or international and public funding provided by subcentral governments' budgets (municipal, city, canton). Apart from expected sources of infrastructural funding coming from subcentral governments' budgets or private funding in the case of private companies, most key stakeholders recognize international financial institutions and commercial banks as primary funding sources. Crowdfunding, funding coming from green

funding options or PPP, as BiH respondents did not consider types of additional funding.

Respondents in Sarajevo Canton have verified that critical stakeholders in the decision-making process regarding financing smart city projects are sub-central governments' representatives - Sarajevo Canton (the Government of Sarajevo Canton and its Ministry of Traffic) and the City of Sarajevo (by two responses each). However, in this process, citizens, private sector representatives, and experts ought to be included (two responses).

6. COMPARATIVE ANALYSIS, RECOMMENDATIONS AND CONCLUSIONS

This study aimed to conduct a comparative analysis of eco-friendly and smart urban public transport financing between the German-speaking countries of Austria, Germany and Switzerland and Bosnia and Herzegovina. The comparison shows that in German-speaking countries, the combination of state funding/support and funding from municipal budgets is the dominant way eco-friendly and smart urban public transport is financed. There are no differences between the three German-speaking countries. This finding aligns with the statements in the strategy papers on the future of mobility in individual countries. The countries see it as their responsibility to ensure that public transport and mobility develop further, and that the necessary infrastructure is provided. This combination is also given to a certain extent in Bosnia and Herzegovina. However, the responsibility for financing - in the example of the Canton of Sarajevo - remains much more with the limited sub-central government's budgets (Cantonal and local government units- municipalities and city) and international sources of financing through loans. Due to their EU membership, Austria and Germany can also access EU funds, an advantage over Switzerland. Bosnia and Herzegovina can also access such funds selectively through specific calls for proposals in which they must participate. Adequate access to public funding appears essential for this country to accelerate the development and implementation of an environmentally friendly smart city (Cecera et al., 2020). In German-speaking countries, private funding is seen much more strongly as a current and future form of financing, which was not mentioned in Bosnia and Herzegovina.

According to the DAC list, this striking difference could be attributed to Bosnia and Herzegovina being categorized as a developing country. It seems impossible to push private funding due to the economic situation (low earnings per capita, high unemployment rate, etc.). Bosnia and Herzegovina have limited subcentral government budgets, so this country needs to attract private investors (Noh, 2019). Implementing crowdfunding and green crowdfunding appears to be an easy-to-implement and alternative form of financing, primarily through digital platforms (Maehle et al., 2020). However, the experts in the German-speaking countries expressed concerns about the implementation. It is more likely to be possible to work with it regionally and to have to do enough convincing work with potential financiers. Only very few respondents from the German-speaking countries argued that direct taxes or other direct levies (e.g., tourism levy) could be used to finance the project because there is still a lack of widespread acceptance among the population, which is a contrary result to proposals in the literature (e.g., Hyung & Baral, 2019; Saboori et al., 2019).

In German-speaking countries, different affected stakeholders are involved in the decisions to give the possibility of articulation and increase the acceptance of the implementation (Hosseini et al., 2018). This can also ensure that the different interest groups' requirements are considered and then implemented (Rocha et al., 2023). Every region/city/community has its characteristics, so they usually have individual solutions for their problems (Pfäffli et al., 2018). In addition, involving public and private stakeholders can exchange ideas so that creative solutions can emerge (Hossain, 2019; Rana et al., 2019). In Bosnia and Herzegovina, this extensive involvement of different stakeholders is given to some extent. However, it should be significantly strengthened compared to the German-speaking countries to achieve greater acceptance and allow different perspectives on projects.

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MONEY LAUNDERING – COMPARATIVE ANALYSIS OF TAX EVASION AS A PREDICATE CRIME IN THE EU MEMBER STATES

Nevena ALJINOVIĆ, Ph.D.
University Department of Forensic Sciences

E-mail: nevena.aljinovic@forenzika.unist.hr

Marijana BARTULOVIĆ, Ph.D.
University Department of Forensic Sciences

E-mail: mbarulo@forenzika.unist.hr

Abstract

Tax evasion and money laundering are two global phenomena whose individual characteristics are intertwined, striving for the same goal and causing far-reaching adverse consequences on economic stability. Some jurisdictions explicitly norm tax evasion as a predicate crime offense of money laundering, while others norm that the predicate criminal offense is any behavior that results in illegally acquired financial gain. Considering that tax evasion is not necessarily characterized by the illegal acquisition of hidden profits, some legislations are skeptical regarding the positioning of tax evasion as a predicate crime offense of money laundering. As a result of the above, the understanding of tax evasion as a de facto predicate crime of money laundering may not follow certain jurisdictions, such as the USA, which uses a narrower definition of money laundering than the one used by the FATF. Still, individual EU Member States' laws sufficiently broadly regulate money laundering and predicate crimes that (almost) any tax evasion can be prosecuted as a predicate crime of money laundering. This paper uses an interdisciplinary approach to analyze money laundering and tax evasion, and the legal and economic aspects of the issue are presented. This paper aims to argue some recent trends in money laundering and compare the predicate crime of tax evasion in EU Member States to reveal the differences and their potential impact on the final result of processing money laundering. The paper contributes to a comparative, cross-

country analysis of regulation related to money laundering and tax evasion in the EU Member States, emphasizing the analysis of penalties for these criminal offenses. Understanding differences in national regulations regarding tax evasion and money laundering is crucial for making further steps to combat them and harmonize regulations.

1. INTRODUCTION

Money laundering is a phenomenon that has intrigued and occupied the international community in recent decades and which could be briefly defined as a special way of concealing the natural origin of illegally acquired money and creating the appearance of its legal acquisition. Several specificities characterize it. First, money laundering is a process, not an individual act, the complexity of which, *among other things*, depends on the type of criminal offense and the degree of complexity of the illegal organizational structure (Cindori & Zakarija, 2017: 16). Second, money laundering differs from other criminal offenses because its essential feature is the existence of a predicate offense. Unlike most other criminal acts, money laundering is always of an accessory nature, i.e., related to the existence of a predicate criminal act. However, although the predicate criminal offense is a condition and element for creating the criminal offense of money laundering, the predicate criminal offense and the criminal offense of money laundering represent two separate criminal offenses (Ariyani & Junaidi, 2022: 114). Thus, in the Netherlands, obtaining or possessing property benefits from criminal activity is a particularly privileged criminal offense concerning the primary form of money laundering (Art. 420. bis. 1 par. 1. WvSr). In Italy, the so-called self-laundering (ital. *autoriciclaggio*) is also a special criminal offense, but under the condition that it was committed "in economic, financial, entrepreneurial or speculative activities in order to hinder the identification of their criminal origin concretely" (Art. 648-ter.1, Codice penale). The Croatian legislature does not explicitly regulate self-laundering. However, judicial practice and legal theory agree that money laundering carried out by the predicate criminal offense of the same perpetrator does not constitute a subsequent unpunished offense due to the apparent merger with the predicate criminal offense concerning the violation of various legal assets (Glavić, 2021: 512; Derenčinović, 2002:

127–128; Novoseelec, 2001: 673). According to Croatian judicial practice, the primary form of money laundering requires that money originating from criminal activity is (further) used and not just deposited in a bank. Therefore, according to judicial practice, money laundering is completed by investing money in various businesses (Novoselec & Roksandić Vidlička, 2010: 716). *Acontrari*o, the Spanish legislator, even for possessing illicit proceeds triggers the offense of money laundering (Maugeri, 2018: 97).

As a result of the above, differences in the legislation of individual countries regarding the legal regulation of money laundering and predicate criminal offenses are evident. In the Eurojust Report, as the most relevant challenge in the context of money laundering, "differences in national legislation concerning the requirements for identifying the predicate criminal offense for the conviction for money laundering" were stated (Eurojust, 2022: 2). Also, it was pointed out that for some countries, the success of the investigation of money laundering is previously conditioned by the investigation and determination of the predicate crime. Thus, the issue of determining the predicate criminal offense determining the source of illegally acquired money is highlighted.

Through this paper, an attempt is made to contribute to the existing literature and to determine and compare the legal regulation of the criminal offense of money laundering and tax evasion as a predicate criminal offense in EU Member States. The paper aims to determine the link between these two criminal acts, which, despite differences like the origin of the property benefit (money), aim to achieve the same goal: integrating dirty money into the legitimate financial system.

The paper is structured as follows. After the first introductory part, a literature review emphasizing trends and challenges in money laundering and tax evasion is presented. The concept of predicate crimes in money laundering is briefly described in the third chapter, while methodology and data are presented in Chapter 4. The results of the conducted research are presented in Chapter 5, while the paper's last chapter brings concluding remarks.

2. LITERATURE REVIEW

Money laundering is a form of economic crime that knows no borders and represents "a serious threat to the integrity of the European Union's economy

and financial system and the security of its citizens" (Eurojust, 2022: 2; Shaikh et al., 2021). Nazar et al. (2023) state that "money laundering has devastating effects on countries, government revenue, foreign investment, economic development, political and peace conditions, bank liquidity, interest rate volatility, and exchange rate volatility" and that despite all the efforts of the national, international and global stakeholders in the context of suppressing this phenomenon, a decrease in money laundering activities is not observed. Although the extent of money laundering is difficult to determine, The United Nations Office on Drugs and Crime (UNODC) estimates that between 2% and 5% of global GDP is laundered annually, which amounts to between €715 billion and €1.87 trillion. Nazar et al. (2023) believe this amount is a little lower and estimate that the amount of laundered money annually amounts to 1.23% of the total world GDP.

Figure 1. Increase in money laundering cases

■ The number of money laundering cases registered at Eurojust

Source: Table made according to Eurojust data, 2022: 6

It is interesting to point out that Eurojust (2022) states that, based on the analysis of 2,870 cases of money laundering in the period from January 1, 2016, to December 31, 2021, a constant increase in money laundering cases can be observed, which makes this topic current and challenging for all stakeholders involved in the anti-money laundering system. Also, 12-14% of all Eurojust registered cases involve money laundering. Figure 1 shows the trend in money laundering cases registered with Eurojust in the observation period (2016-2021). As one of the spread indicators of this problem among the EU Member States,

several special purpose transactions related to money laundering published by Offices for the Prevention of Money Laundering can also be used. Cotoc et al. (2021: 16) point out that based on the analysis of the Suspicious Transaction Report (STR) in the period 2018-2019, an increase in the number of cases with suspected money laundering (and financing of terrorism) is also observed.

On the other hand, tax evasion is also a phenomenon that negatively affects the economy of every democratic state because it is directly reflected in the reduction of the state budget. Tax evasion results from defects and inappropriateness of imperfect fiscal legislation, defective enforcement methods, failure of the legislator, and lack of adequate and well-organized financial control (Bistriceanu & Badea, 2010: 292). Preventing and combating tax evasion requires knowing the causes that favor it, which due to their heterogeneous nature, can have an economic, social, moral, or political character (Comândaru, Stănescu & Păduraru, 2018). In this respect, consistent financial control, resulting in (strict) civil and criminal liability, can contribute to the successful prevention and fight against tax evasion. Rossel et al. (2020: 41) examined whether "the implementation of tax crimes as a predicate crime for money laundering in the 4th AMLD is a useful tool for the fight against tax evasion," and according to their results, "introducing tax crimes as predicate crimes for money laundering is an important step in the fight against tax evasion."

Hence, it is clear that money laundering, as well as tax evasion, represent a significant and continuous challenge for all stakeholders involved in the process of combating it. Since the criminal offense of money laundering must involve illegally acquired money whose origin must be concealed, thus the predicate criminal offenses for money laundering represent a specific challenge to which policy regulators have not yet found common grounds and answers.

3. CONCEPT OF PREDICATE CRIMINAL OFFENSE

A key concept in the fight against money laundering is predicate crimes. A predicate criminal offense is any criminal offense by which an (illegal) financial benefit is obtained, which is later (apparently) legalized through money laundering (Palijaš, Hržina & Biluš, 2017: 28), i.e., it is "the basic criminal offense that led to the proceeds of a criminal offense that is the subject of a charge of money laundering" (Bell, 2003: 137).

According to the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances (1988), initially, the only predicate crime was drug trafficking. However, in the mid-1990s, the definition of the predicate offense expanded, resulting in a significant expansion of the scope of Money Laundering Prevention measures. It was not until 2012 that the Financial Action Task Force (FATF) recommended the inclusion of tax offenses as predicate offenses for money laundering. For many years tax evasion has been excluded from the legal provisions dealing with money laundering, and it took a long time before tax crimes were included in the catalog of money laundering predicate offenses (Spreutels, Grijseels, & Unit, 2000: 2). There are several reasons for that. Firstly, it is often pointed out that tax evasion is not a "serious" crime since it falls under the category of white-collar crime, and the damage caused is incomparably minor than the damage caused by drug trafficking or terrorism. This point of view is wrong since many countries' laws consider tax evasion a crime. The second argument starts from the fact that the behavior from which the concealed profit originates is legitimate, which means that the profit obtained through tax evasion is also legitimate. Unpaid tax on realized but concealed gain does not make the profit illegitimate. However, this statement does not consider that the criminal offense is not the behavior that creates profit but the act of concealing that profit that should be paid in the form of taxes (Oliver, 2002: 57). The third argument is that standardizing tax evasion as a predicate crime would put too much pressure on professional advisers or bank employees, making them "vulnerable" to prosecution for (negligently) assisting in money laundering (Rossel et al., 2020: 10).

Tax evasion, corrupt crimes, and drug abuse are the biggest challenge for money laundering. The primary feature of tax evasion is a direct violation of legal provisions (Cindori & Zakarija, 2017: 15; Šimović, Rogić Lugarić, & Cindori, 2007: 594). Two interdependent and connected components characterize it. Firstly, there must be an intention not to declare income or to provide incorrect or incomplete information about income. Secondly, the aim is to (fully or partially) avoid paying taxes. In most cases, tax evasion will be combined with other criminal acts that are used to achieve the ultimate goal, which is the acquisition of illegal property benefits (and non-payment of taxes to the state) (Glavina & Dragičević Prtenjača, 2018: 195).

Tax evasion techniques can be as simple as understating service revenue or overstating tax deductions or as complex as creating layered tax haven entities

(Kemsley, Kemsley & Morgan 2020: 592). However, there is no unified definition of tax evasion, so Matković (2013: 162) defines it as "illegal avoidance of tax liability, which includes illegal actions or omissions that conceal or avoid tax liability for not paying tax or paying less tax than the law prescribes." Mladineo (2008: 47) states that it is an " intentional, planned and deliberate non-declaration of income" legally taxable. For Klier (2007: 786), tax evasion (defrauding) is the conscious failure to pay taxes. Torres Serpel & Shachmurove (2005: 59) see it as the elimination or diminution of a tax amount, achieved through "fraudulent activities or with the omission and violation of legal provisions." According to OECD (2015: 85), tax fraud "involves the direct violation of tax law and may feature the deliberate concealment of the true state of a taxpayer's affairs to reduce tax liability."

Although the incorporation of tax offenses as a predicate offense was a "key area of dispute," the fact that tax offenses represent a problem at the global level and in many jurisdictions constitute a legislative gap in money laundering that incorporation was necessary (Rossel et al. 2021: 240). However, despite the above, tax evasion as a predicate crime of money laundering is not universally accepted. For example, tax evasion in some countries is only a misdemeanor, while in others, it is a criminal offense (only) when it exceeds a certain amount of money (Unger, 2017: 29; Brun et al., 2022: 16) or is associated with severe fraud.

4. METHODOLOGY AND DATA

To analyze the criminalization of money laundering and tax evasion in EU Member States and differences in prescribed penalties, we formed a database of regulations related to tax crime and money laundering in all EU Member States. Data sources required for analysis are secondary data sources consisting of legal materials or regulations. To obtain regulations on tax evasion and money laundering, we used many resources and looked for the laws related to these criminal offenses in the official gazette of each country included in our research.

Focus was on criminal codes, tax laws, and anti-money laundering laws. After gathering relevant laws, we performed its content qualitative analysis. We analyzed and extracted the data related to criminal offenses of money laundering and tax evasion, as well as prescribed penalties for these offenses. We performed a systematic analysis to get a deductive conclusion on the issue and

achieve the determined objectives of the research, i.e., to determine differences in tax evasion and money laundering regulation among EU Member States as well as differences in penalties for these offenses.

5. RESULTS AND DISCUSSION

Certain overlaps between tax evasion and money laundering have long been recognized. Namely, both crimes often rely on similar techniques. Corporate shell companies and fraudulent accounting journal entries are often the tools for both offenses (Kemsley, Kemsley & Morgan 2020: 590). By comparing the definitions of tax evasion and money laundering, it is clear that these are criminal offenses whose basic form can only be committed with intent, and the essential determinant of both is the concealment of realized profits (Storm, 2013: 1440).

Undoubtedly, tax evasion in all EU Member States is regulated as a criminal offense through the provisions of the criminal code or criminal and administrative offenses in special legislation. Most legislation considers it a predicate criminal offense of money laundering. However, let us analyze the legal definitions of money laundering in different countries. Tax evasion is often excluded from the money laundering definitions (Unger, 2009: 2). Efforts done at the international level through FATF recommendations that included tax evasion as a predicate crime for money laundering in 2012, as well as incorporating tax crimes as predicates crimes for money laundering in the 4th Anti Money Laundering Directive in 2015, have not offered a unique approach in the fight against money laundering. More precisely, each Member State can choose how to incorporate these principles into national regulations, and as expected, differences in these regulations appeared (Rossel et al., 2022: 782). Analyzing and understanding these differences is essential for further efforts in combating money laundering since it is likely that criminals will use the weaknesses of specific countries and go where they perceive sanctions for money laundering to be the weakest.

The table below shows the normative regulation and prescribed sanctions for criminal offenses of money laundering and tax evasion in all EU Member States.

Table 1. Criminalization of money laundering and tax evasion in EU Member States

No.	State	Money laundering	Tax evasion
1.	Austria	❖ Criminal Code (§ 165 StGB) • imprisonment from 6 months to 5 years (from 1 up to 10 years for aggravated money laundering)	❖ Fiscal Offences Act (§ 33 FinStrG) • fine of up to the twofold amount of the evaded taxes, • imprisonment for up to 4 years
2.	Belgium	❖ Code Penal (Art. 505) • imprisonment from 15 days to 5 years and/or • a fine of €26 to €100.000 • imprisonment of 8 days to 3 years and/or a fine of €26 to €50.000 for attempting the offenses	❖ Belgian Income Tax Code • imprisonment from 8 days to 2 years and/or • a fine from €250 to €500.000
3.	Bulgaria	❖ Criminal Code (Art. 253) • fines from 3.000 to 5.000 BGN[1] • imprisonment from 1 to 6 years (up to 15 years imprisonment and fine of up to 200.000 BGN for aggravated money laundering)	❖ Criminal Code (Art. 255) • fine up to 5.000 BGN (or up to 10.000 BGN in case of 255a) • deprivation of rights • confiscation of the property • imprisonment from 1 to 6 years (for large amounts, 3 to 8 year imprisonment)
4.	Croatia	❖ Criminal Code (Art. 265) • imprisonment from 6 months to 5 years (up to 8 years for aggravated money laundering)	❖ Criminal Code (Art. 256) • imprisonment from 6 months to 5 years (up to 10 years for aggravated money laundering)
5.	Cyprus	❖ Prevention and Suppression of Money Laundering and Terrorist Financing Laws (Section 4) • 14 years imprisonment and a fine of up to €500.000 or both in the case of knowledge • five years imprisonment or a fine of €50.000 or both in case of ought to have known	❖ Assessment and Collection of Taxes Law - Sections 49(1), 51(a) ❖ Value-Added Tax Laws (Section 46) • fine up to €17.000 and/or imprisonment up to 5 years • monetary penalty up to €5.000 and/or imprisonment up to 2 years • fine up to 50.000 CYP and/or imprisonment up to 3 years • administrative penalties: €100-€200 • penalties and surcharges and another 5%

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[1] Although EU Member State Bulgaria has not introduced the euro, the official currency is the lev (1 BGN = 0.51 EUR).

6.	Czech Republic	❖ Criminal Code (Art. 216) • imprisonment up to 4 years (up to 8 years or confiscation of property for aggravated money laundering), • pecuniary penalty, • prohibition of activity, • or to confiscate items or other asset values •for negligence, imprisonment up to 3 years, prohibition of activity, or confiscation of items or other asset values (Art. 217)	❖ Criminal code (Art. 241) Tax code • imprisonment up to 3 years (up to 8 years for aggravated forms) • fine • increase of tax base
7.	Denmark	❖ Criminal Code (§ 290a) • fine and • imprisonment of up to 1 year and six months (up to 8 years for aggravated money laundering)	The Danish Tax Agency has authority in all criminal cases involving gross negligence and deliberate tax evasion (only when the amount of evasion does not exceed: DKK 250.000[2] for violations of tax legislation, the VAT Act, the Labour Market Contributions Act, and the Payroll Tax Act DKK 100.000 in violations of excise duty laws). • fines from DKK 100.000 to 250.000 • imprisonment
8.	Estonia	❖ Penal Code (§ 394) • fine or • imprisonment up to 5 years (from 2 to 10 years for aggravated money laundering) • money laundering agreement: pecuniary punishment or imprisonment of up to 1 year	❖ Penal Code (§ 389 and § 390) ❖ Taxation Act (§ 153) • Misdemeanour: fine up to 300 fine units (up to €32.000 if committed by a legal person) • Criminal: fine or imprisonment up to 5 years (1 to 7 years if the tax evasion is large)
9.	Finland	❖ Criminal Code - Chapter 32 Receiving and money laundering offenses, Section 6 and 7 (61/2003) • fine or • imprisonment up to 2 years (from 4 months up to 6 years for aggravated money laundering)	❖ Criminal Code - Chapter 29 ❖ Act on Assessment Procedure • fine or • imprisonment up to 2 years (from 4 months up to 4 years for aggravated forms)

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[2] Although EU Member State Denmark has not introduced the euro, the official currency is the Danish krone (1 DKK = 0.13 EUR).

10.	France	❖ Penal Code (Art. 324-1 and 324-2) • fine up to €375.000 and • imprisonment of up to 5 years (up to 10 years and a fine of €750.000 for aggravated money laundering)	❖ Penal Code (Art. 313-1) ❖ General Tax Code (Art. 1741) ❖ General Tax Code (Art. 1728 and 1729) • Administrative: an additional tax charged from 10% to 80% • Criminal: fine up to € 375.000 and imprisonment up to 5 years (up to 7 years and fine up to €750.000 for aggravated form/ up to 10 years and a fine of € 1,000,000 when involved organized crime)
11.	Germany	❖ German Criminal Code (Section 261 StGB) • fine or • imprisonment up to 5 years (from 6 months to 10 years for aggravated money laundering).	❖ The Fiscal Code - Section 370(1) • fine or • imprisonment up to 5 years
12.	Greece	❖ Law 4557/2018 - Prevention and suppression of money laundering and terrorist financing and other provisions (Art. 2 and 39) • imprisonment up to 10 years and a pecuniary penalty of €20.000 to €1.000.000 (imprisonment of at least ten years and a pecuniary penalty of €50.000 to €2.000.000 for aggravated money laundering)	❖ Law 4174/2013 – Code of Tax Procedures ❖ Law 4337/2015 - Measures to reduce tax evasion, immediate regulations and indirect taxation and other provisions • 2 to 5 years imprisonment for evading tax payments of amounts of €100.000 – €150.000 • 5 to 20 years imprisonment for evading tax payments exceeding €150.000
13.	Hungary	❖ Criminal Code (§ 399) • imprisonment from 1 to 5 years (2 to 8 years if money laundering is committed on a commercial scale)	❖ Criminal Code (§ 396) ❖ Act on the Rules of Taxation • imprisonment up to 3 years (1 to 5 years for aggravated forms)
14.	Ireland	❖ Money Laundering and terrorism financing Act – 2010, Sections 6 to 16 • Summary conviction: fine not exceeding €5.000 or imprisonment up to 12 months (or both). • Conviction on indictment: fine and/or imprisonment for a term not exceeding 14 years.	❖ Taxes Consolidation Act 1997, Section 1078 • Summary conviction: Fine of €5.000 or imprisonment up to 12 months imprisonment or fines to (or both). • Conviction on indictment: fine not exceeding €126,970 and/or imprisonment up to 5 years.
15.	Italy	❖ Criminal Code (Art. 648 to 648-ter 1) • imprisonment from 2 to 8 years and a fine from €516 to €10.329 (from 4 to 12 years and a fine from €5.000 to €25.000 for aggravated money laundering)	Several normative acts: ❖ D.P.R. October 26, 1972, n. 633 regarding VAT ❖ D.P.R. 29 September 1973, n. 600 regarding the assessment of income taxes. For penalties D. Lgs. March 10, 2000, n. 74 (Criminal) ❖ D. Lgs. 18 December 1987, n. 471 (administrative) • imprisonment from 1 to 6 years

16.	Latvia	❖ Law on the Prevention of Money Laundering and Terrorism and Proliferation Financing (Section 5) • imprisonment up to 3 years or • temporary deprivation of liberty, • community service, or • a fine, with or without confiscation of property	❖ Criminal Law (Section 218) • imprisonment for up to 4 years, or • temporary deprivation of liberty, or • community service, or • a fine, • confiscation of property • deprivation of the right to engage in entrepreneurial activity types or employment for a term of not less than two years and not exceeding five years. • If committed by an organized group, up to 10 years imprisonment
17.	Lithuania	❖ Criminal Code (Art. 216) • imprisonment up to 7 years	❖ Criminal Code (Art. 219 to 221) ❖ Administrative Offense Code (Art. 187) • up to 4 years imprisonment (up to 8 years for aggravated forms) • warning note or a fine from €60 to €140
18.	Luxembourg	❖ Criminal Code (Art. 506-1) • imprisonment of 1 to 5 years and/or • fine of €1.250 to €1.250.000 (15 to 20 years and/or a fine of €1.250 to €1.250.000, (for aggravated money laundering, Art. 506-5)	❖ Tax reform law of December 23, 2016 • Administrative offense: fine from 10% to 50% of the evaded taxes. • Criminal offense of aggravated tax evasion: fine from €25.000 to 6 times the evaded amount of taxes and imprisonment from 1 month to 3 years.
19.	Malta	❖ Prevention of Money Laundering Act (Chapter 373 of the Laws of Malta) – offense ❖ Criminal Code, Chapter 9 • fine up to €2.330.000 and/or • imprisonment for up to 14 years (up to €2.50.000 and/or imprisonment up to 18 years for aggravated money laundering)	❖ Income Tax law • imprisonment, • various administrative fines
20.	Netherlands	❖ Penal Code (Art. 420 bis to Art. 420quater.1) • imprisonment up to 6 years or a fine of the fifth category	❖ General Tax Act (Sections 68 to 69a) • imprisonment from not more than six months (Section 68) to • imprisonment up to 4 years (Section 69), i.e., six years (Section 69a) or • money fines from the third to the fifth category
21.	Poland	❖ Penal Code (Art. 299) • imprisonment from 6 months to 8 years	❖ ACT of September 10, 1999. Fiscal Penal Code (Art. 53 §2) • fine (in daily rates) • restriction of liberty • imprisonment • forfeiture of items or material gains • prohibition to carry out certain business activities or to perform a particular profession

22.	Portugal	❖ Criminal Code - Art. 368-A (3) ❖ Law No 25/2008, of June 5, transposes Directives 2005/60 and 2006/70 • Administrative sanction: up to €2.500.000 • Criminal sanctions: imprisonment up to 12 years	❖ Law 15/2001, of June 5 (Art. 87 to 105) • Administrative sanction: up to €165.000 • Criminal sanctions: imprisonment up to 8 years or fines between 10 and 600 days
23.	Romania	❖ Law No. 656/2002 regarding the prevention and sanctioning of money laundering • imprisonment from 3 to 10 years	❖ Law No. 241/2005 for the prevention and the fight against tax evasion (Art. 8 and 9) • imprisonment from 3 to 10 years
24.	Slovakia	❖ Criminal Code (§ 233) • imprisonment from 2 to 5 years (12 to 20 years for aggravated money laundering)	❖ Criminal Code (§ 276 to 278a) • imprisonment from 1 to 5 years (possibly up to 12 years according to the gravity of the crime)
25.	Slovenia	❖ Criminal Code (Art. 245.) • imprisonment of up to 5 years (up to 10 years for aggravated money laundering)	❖ Criminal Code (Art. 249) ❖ Tax Procedure Act (penalty provisions, Art. 394 - 402.b) • Administrative: fine from €250 to €150.000 • Criminal: imprisonment from 1 to 8 years (3 to 12 years if committed by criminal organization)
26.	Spain	❖ Criminal Code (Art. 301) • imprisonment of 6 months to 6 years and • a fine from one to three times the value of the goods • special barring from exercise of his profession or industry for a term from one to three years, and • measure of temporary (may not exceed five years) or definitive closing of the establishment or premises	❖ Criminal Code (Art. 305 and 305) • imprisonment from 1 to 5 years and • a fine from one to six times the amount involved, • loss of the possibility to obtain public subsidies or aid and entitlement to tax or Social Security benefits or incentives for a period from three to six years
27.	Sweden	❖ Law (2014:307) On Penalties for Money Laundering Offences (§§ 3 to 7) • imprisonment of up to 2 years (6 months up to 6 years for aggravated money laundering)	❖ Tax Offences Act (1971:69) (§§ 2 to 4) • imprisonment of up to 2 years (6 months up to 6 years for the severe tax crime)

Source: The table was made according to the data of the criminal and tax laws of the EU Member States and the data available on the page European Parliament - Member States capabilities in fighting tax crimes

Some countries such as Belgium, Finland, France, Italy, the Netherlands, Spain, and Sweden consider tax offenses a predicate money laundering offense, while in Denmark, Luxembourg, and Portugal, tax offenses are not considered severe offenses for money laundering. In Austria, only customs fraud and eva-

sion of import and export duties are considered a predicate crimes of money laundering, while in Germany, tax evasion is a predicate crime of money laundering if it is committed by a member of a criminal organization (Spreutels, Grijseels, & Unit, 2000: 11). For the Dutch, tax evasion is a criminal offense only when it is associated with severe fraud. Otherwise, it is considered a misdemeanor (Unger, 2009: 3). In Croatia, tax evasion is a criminal offense only if the objective condition of punishment is met, i.e., if the amount of tax evaded is greater than €2.654,46 and the crime was committed with the intention (direct or indirect) to avoid tax payment, either in whole or in part. For tax evasion as a misdemeanor, negligence is sufficient, i.e., a violation of due diligence (Matković, 2013: 162).

As can be seen from the table above, most EU Member States regulate tax evasion exclusively through tax laws. In contrast, in a smaller number of countries, this issue is regulated by criminal legislation. However, regardless of the differences in the legal regulation of tax evasion, it is undoubtedly a serious crime where the amount of the prescribed penalty coincides with the amount of concealed profit or the challenging circumstances of the commission of the crime (e.g., if the crime was committed as part of a criminal association, if it is a large-scale crime, etc.) (IEWG, 2020: 4). From the conducted analysis, it is clear that 37% of EU Member States prescribe the same punishment for tax evasion as for money laundering, which supports the conclusion that the same degree of social harm is recognized for both crimes. Finally, 55.6% of the legislative solutions favor a stricter punishment for money laundering, while 7.4% of countries prescribe a more stringent punishment for tax evasion.

Furthermore, differences among EU countries are noted when analyzing penalties for money laundering. Data show how prescribed prison sentences range between minimum fines and a maximum value of 20 years. For example, some of the highest imprisonments for money laundering are normed in Slovakia (even 20 years in cases of considerable benefits), Bulgaria (maximum imprisonment of 15 years), and Malta (maximum imprisonment of up to 14 years). On the other hand, the lowest minimum value was noted in a few countries (such as Cyprus, France, and Greece), which shows that some EU countries are not harmonized with EU regulations from 2018., according to which standardized EU minimum prison sentence for money laundering is four years (Rossel et al., 2020: 253). Most EU Member States have a minimum sentence below this value, meaning that further efforts in harmonizing laws and remov-

ing loopholes in the regulations of Member States should be made. Considering tax evasion and prescribed prison sentences, differences among observed countries were also noted. For example, the lowest imprisonment sentence is only a few days (for example, the case of Malta, France, and the Netherlands).

In contrast, the highest prison sentence is prescribed in Slovakia, with a maximum prison sentence of 12 years. Research results show that despite significant efforts that have been made to harmonize money laundering, legislative differences among EU Member States are (still) noticed. Differences exist in prescribed sanctions for criminal offenses, money laundering, and tax evasion. These differences enable criminals to move and operate in those countries with weaker regulations, and further harmonization of legislation is a severe challenge to all stakeholders involved in combating money laundering.

6. CONCLUSION

Criminal offenses of money laundering and tax evasion differ in the money origin. However, the success of both crimes depends on the ability to conceal the source of the origin of the money. Money laundering attempts to show the apparent legality of the illegal origin of money. At the same time, tax evasion focuses on providing incorrect information or not reporting income to avoid taxes. Hence, operationally quite different processes, money laundering, and tax evasion share the same sophisticated techniques of funds concealing (Spreutels, Grijseels, & Unit, 2000: 2). Tax evaders usually use money laundering methods. For example, illegal profits resulting from tax evasion can be deposited into the offender's bank account (money deposit phase). Also, tax evaders can use various transactions to conceal illegal profits, such as fake transactions and/or documents, to falsely present the income as a gift, inheritance, or other tax-free income (layering phase). However, tax evasion often lacks the third stage inherent in money laundering - the integration of income back into the legitimate economy - since successful tax evasion automatically integrates illegal tax savings into legal, financial flows without any further steps in money laundering. Ultimately, successful tax evasion fulfills the same goal as money laundering: integrating dirty money into the legitimate financial system.

The main goal of this research was to compare the legal regulation of money laundering and tax evasion in EU Member States and to determine differences in national regulations and prescribed sanctions. The connection between these

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two criminal offenses stems from the very analysis of their definitions, a comparison of which shows that both behaviors represent illegal activities characterized by the concealment of the real origin or the actual amount of money, often relying on similar techniques. Although some scholars believe that tax evasion, since the activity from which the profit derives is legal, cannot be equated with the concealment of (illegal) profit in money laundering, the general understanding is that, when it comes to tax evasion, the illegality does not rest on the action of obtaining a profit but on the illegality of concealing the amount of money on which tax should be paid. Considering the apparent connection between tax evasion and money laundering, skepticism against treating tax evasion as a predicate criminal offense is unjustified, and skepticism concerning other predicate criminal offenses is not present.

The research results showed differences between EU Member States in prescribing punishments for criminal offenses of money laundering and tax evasion. Notably, some EU Member States prescribe a sentence below the EU recommendation of a minimum of four years, which implies that further and more vigorous efforts are needed in harmonizing laws with EU Directives and recommendations of international organizations (such as FATF). This is a prerequisite for removing regulation loopholes and achieving harmonized money laundering legislation. In this regard, future research could explain the observed differences between EU Member States and monitor further harmonization efforts.

It should be noted that, for this research, we analyzed only specific parts of legislation in each country related to criminal law, tax law, and anti-money laundering laws, and the paper does not offer the information required for assessing the legal systems of the observed countries. Also, as a limitation of the research, the legislation in some countries was not translated into English, making the research and data gathering more difficult.

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THE USE OF THE CRM MODEL AS A COMPETITIVE ADVANTAGE OF CROATIAN HOTEL COMPANIES

Andreja RUDANČIĆ, Ph.D.
Libertas International University Zagreb

E-mail: arudancic@libertas.hr

Edvard BADURINA
Euroton International d.o.o., Rijeka

Sandra SOKČEVIĆ
Libertas International University Zagreb

E-mail: ssokcevic@libertas.hr

Abstract

A significant segment that appears in the development and progress of a hotel company is business intelligence, which assumes strategic importance in the competitive battle of the tourist market. In other words, business intelligence responds to competition activities and the new business culture of Customer Relationship Management (CRM) as a new relationship with tourists, in this case, hotel guests, all to generate a new, unique experience for tourists as a driver of change. The main goal of this paper is to determine the role of CRM as a concept of value in relations with the hotel guests, which represents knowing the guest so that the hotel company "delivers" greater value for money. The methodology of the work is based on empirical research using a survey questionnaire conducted during September and October 2019. The sample consisted of active stakeholders in hotel business management in Croatia. The results of the survey were processed using the IBM SPSS Statistics program, and the general conclusion indicates that the CRM model is an additional competitive advantage that can provide hotel companies with the capacity to gather knowledge about current and potential guests and act on them in proactively reshaping the hotel's interaction with guests.

1. INTRODUCTION

In a way, CRM is a methodology of the hotel company that is used as an upgrade of orientation towards the guest (client). That is, it is a process that creates personalized permanent connections between the hotel company and the guest, all to increase his satisfaction with the service provided. In the direction of this thinking, it should be pointed out that CRM was created at a time of significant growth in interest in direct contact with the guest and the introduction of information and communication technology into the business of hotel companies, and as such it assumes strategic importance in the business of a hotel company. CRM experiences its development by including social relations with clients and gradually moves to SCRM or CRM 2.0. The development of statistical applications opens up the space for CRM to manage large databases (Big Data), enabling interaction with many clients. The purpose of this paper is to use scientific and research methods to gain knowledge about the involvement of information technology in the business of a hotel company, to evaluate the effects of integrated communication services in a hotel, to evaluate the acceptability of CRM in a hotel business, and to assess the development possibilities of using CRM in perspective with an appropriate model. Following the above, the primary task is to draw reasoned conclusions based on the conducted empirical research, statistical analysis, and the obtained conclusions following the purpose of the work.

2. LITERATURE REVIEW AND PREVIOUS RESEARCH

Research on CRM in the hotel industry so far is multiple and dates back to the very beginnings of using CRM in the hotel industry in 1988, when, as edited and classified by Sota, Chaudhry and Srivastava (2019), over 9,000 professional and scientific research were published articles, books, conference documents and reports. Chronologically, these studies can be classified into three periods:

(1) The period from 1988 to 2000. The oldest article relevant to this systematic literature review was published in 1988 in the International Journal

of Hospitality Management, authored by Haywood (1988), entitled Repeat Patronage: Cultivating Alliances with Customers, in which the importance of cultivating customer relationships is indicated. After 1998, continuity continued in published research on CRM in the hospitality industry. In this period, 132 articles on CRM were published, of which only 11 were related to the hotel industry. Most papers were related to application technology, and there was no research on strategy, organization, structure, and culture during this phase. Two cited papers were published in that period, and both papers (Bowen & Shoemaker, 1998; Kandampully & Suhartanto, 2000) were about customer loyalty.

(2) The period from 2001 to 2010. During this phase, the most important thing was using technology in CRM. Research related to the use of technology for collecting, storing, analyzing and using customer data as a marketing base for maintaining long-term relationships with customers was significant. Empirical research on the use of CRM and analysis and discussion of the obtained results are also conducted. Results are discussed in various forms, such as customer retention, customer loyalty, word of mouth, repeat purchase, customer satisfaction and financial performance. More articles related to organizational structure and culture can be observed (12%).

(3) The period from 2011 to 2018. 61% of all publications on CRM in the hotel industry were published in this period. This clearly shows that this field has gained importance among scientists and experts. Monitoring synchronization with previous years' trends was the research's focus. Most of the articles that have been published have focused on the results and benefits of CRM, followed by technology and loyalty. The topics that dominated in that period were related to users' fidelity (loyalty).

The majority of scientific papers on the topic of CRM in the hotel industry were published in specialized journals that follow the topics of hotel management, catering and tourism, so according to the research of Sota, Chaudhry, and Srivastava (2019:8), the most represented International Journal of Contemporary Hospitality Management (21% of all papers), International Journal of Hospitality Management (14%), Journal of Hospitality and Tourism Management (6%) and Journal of Hospitality Marketing & Management (5%).

The topics that dominated these surveys were: 1) technology, 2) results, 3) loyalty programs and 4) consumer-guest perception.

(1) Technology is the most important aspect of CRM in studies conducted in the past. The hotel industry extensively uses technology to maintain long-term relationships with its guests. Technology has been used in various forms and platforms, such as a website, database marketing, social media site and many others. Gilbert, Powell-Perry and Widijoso (1999) published one of the first papers on using the Internet as a CRM strategy, especially concerning the hotel sector. Using a qualitative method, they concluded that the global Internet could solve the challenges faced by the hotel industry at the end of the 20th century. Diffley, McCole and Carvajal-Trujillo (2018) investigated the use of SCRM, that is, using social media platforms to maintain customer relations. They concluded that it increases innovation and leads to increased financial results. Talón-Ballestero et al. (2018) investigated how it is possible to use large databases (Big Data) from CRM information systems for guest profiling. Their research helped identify the profile of new and regular hotel guests. Numerous other studies related to technology are also significant, such as data on birthdays (Dursun & Caber, 2016) use of Facebook (Su, Mariadoss, & Reynolds, 2015), the use of website features (Bilgihan & Bujisic, 2015), mobile technology (Anne Coussement & Teague, 2013) and information systems (Ku, 2010).

(2) The results. Understandably, numerous CRM studies are devoted to understanding the success and results of using CRM programs. Rahimi and Kozak (2017) investigated the impact of CRM on customer satisfaction in UK "budget hotels". They concluded that CRM systems lead to an efficient process of reservations, registrations, and adjustments, but also that efficient systems in themselves do not lead to the success of a hotel but are still the basic activities of a pleasant stay and affordable prices. Analysis of the costs and benefits of CRM in the hotel industry was carried out by Shanshan, Wilco and Eric (2011), profitability analysis was done by Iyengar and Suri (2011), the correlation between the use of CRM and revenue was investigated by Wang and Feng (2012), while Piccoli (2008) established a framework for evaluating customer data in the hotel industry.

(3) the hotel industry often uses loyalty programs to build long-term relationships with guests. By its very nature, the high quality of the service affects tourists, evokes positive emotions and generates high tourist satisfaction. Satisfaction, enhanced by trust, contributes to loyalty (Marković & Kljajić Šebrek, 2020). Several authors have focused on customer loyalty and loyalty programs in CRM research. Bowen and Shoemaker (1998) cited articles on this topic,

where the relationship between CRM and loyalty programs is established. Xiong et al. (2014) investigated the relationship between loyalty to behavior and perceptions of guest loyalty programs. Their findings indicate that guests like the flexibility to buy loyalty program points and do not like paying premiums for the brand.

(4) Consumer-guest behaviour. According to Kotler and Keller (2012:151), consumer behavior is the study of how individuals, groups and organizations choose, buy, use and accept goods, services, ideas or experiences to satisfy their needs and desires. Louvieris, Driver, and Powell-Perry (2003) focused on understanding changes in consumer behavior due to multi-channel access to the Internet and, consequently, the impact on guest relations. Their results indicate that interactive online services can help attract guests and build loyal relationships with them. Maggon and Chaudhry (2018) investigated the relationship between customer satisfaction and guest attitudes from a CRM perspective, while Kim, Knutson and Vogt (2014) focused on the differences in the behavior of first-time guests and regular hotel guests and found that attitudes those guests who visit a hotel for the first time are more favorable than the attitudes expressed by regular guests.

Due to its diversity of types and subtypes of different types of tourism, the Croatian tourist area is grateful for as much research. The high school and higher education system with a significant scientific population has produced an enviable number of research in the framework of final or graduate theses and professional and scientific, master's and doctoral theses that have incorporated appropriate field research. However, it should be emphasized that even though it is a quality professional and scientific basis, the passage of time requires permanent upgrading. Namely, the changes that occurred in the new millennium, especially in the information and communication technology segment, considerably changed tourists, tourist trips and the entire tourism industry. A tourist is no longer an object of tourism that depends on supply and demand. However, a subject who actively participates in the creation of his trip and who wants to see and experience more in the shortest possible time, who is looking for "value for money", depends only on his "smartphone". The changes initiated by the advent of broadband Internet and the fourth-generation mobile network (4G) as a basis for numerous applications have made many previous studies archaic. Their updating can only be achieved through new research. The same applies to the real sector. Managers in tourism, who understand the message of new

technology, achieve their competitiveness in the tourist market by constantly upgrading their knowledge, improving quality, and following current trends. Exemplary research relevant to the paper's topic on organizational needs for information technology in the hotel industry was conducted at the beginning of the millennium (2002) when IT in Croatia was on the rise. However, the infrastructure and speed of data transmission were incomparable twenty years later. However, for the sake of comparison, it is essential to look at the research results presented by Galičić and Cerović (2004). Research on the perception of hotel management towards the use of IT in the hotel business was conducted on a sample of 91 directors from 31 hotel companies from all over Croatia.

The research results succinctly indicate: "that to a certain extent, almost all hotel facilities use information technology and that their managers are aware of the need for further implementation of modern tools, which are offered by information technology" (Galičić & Cerović, 2004:179). More than 77 % of respondents believed that information technology increases the overall efficiency of all hotel operations. In contrast, 44% of managers believed that the applied information technology did not produce sufficiently high productivity and thus justified the invested costs. It should be taken into account that the research was conducted at the time of the intensive introduction of IT into the hotel industry, but that the existing structures were not yet ready for the changes and advantages that this technology offers, which the authors of the research call the "productivity paradox" which is "a product of bad management which failed to connect the business strategy with the possibilities of technology" (Galičić & Cerović, 2004:184). The following research relevant to the topic of DD conducted in 2010 was research on the development of information systems of large hotel companies in Croatia according to the system maturity model, which Grbin Praničević, Pivčević and Garača conducted on a sample of 39 hotels, i.e., 24 hotel companies. The elements of IS development were assessed (2010:196): data storage, reliability, integrity, networking, access to information inside the hotel, access to information from outside the hotel, hardware renewal cycle, software renewal cycle, level of management support, availability, security and computer literacy. The development of an IT system is closely related to the development of the components that characterize that system. The overall average rating of all twelve elements was 3.25, indicating a relatively good result (in 2010). However, the research showed that the elements "data storage" and "information literacy" were rated the worst, which shows that "investments in

information systems are not accompanied by adequate investments in human resources" (2010:196). The results of the conducted research only continue the trend of the results of previous research.

2.1. CRM – A FUNCTION OF THE INTEGRATED INFORMATION – COMMUNICATION SYSTEM OF THE HOTEL COMPANY

With the development of social relations in the economy in general, the problems of the hotel industry in all forms of business are expanding. Thus, in parallel with the evolution of information science and communication technologies, guest relations management has intensively developed in the hotel industry. Of all the advantages of e-business offered in the hotel industry, the most significant is the ability to access information from all over the world in real time. As a global network, the Internet supports several functions and processes in the hotel business to develop products and provide services for guests. Furthermore, the Internet represents a powerful communication medium that can effectively connect the hotel and the guest as service providers and receivers. The Internet enables their communication interaction and the accompanying computer technology records, processes and analyses their correspondence to manage relations with guests.

Given that the hotel industry represents the infrastructural base of tourism and travels in a broader sense, it is, therefore, necessary to view the management of relations with guests in the hotel industry in the context of these phenomena. The e-business category in the hotel industry is at a broader world level, and thus also in the national hotel industry in constant progression. Hotel guest relationship management is a version of CRM adapted to hotel systems and is available in different versions, from web servers to specialized software packages. Several definitions of customer relationship management are essentially the same and depend on the author's point of view and his view of these relationships. There is generally a consensus that CRM is a combination (symbiosis) of business processes and technology, which aims to understand the different interests of the factors of the relationship between service providers and users. This definition helps distinguish the competitiveness of products from services (Al-Shammari & Mallouh, 2012). From a marketing point of view, customer relationship management is a strategic business approach based on the relationship marketing theory. It is defined as "the process of acquiring, retaining and partnering with selective customers to create superior value for the company and the customer" (Parvatiyar & Sheth, 2001:6).

Through the use of computer technology, CRM has evolved into electronic customer relationship management, where technology is used to serve and fulfill the wishes of customers, thereby realizing added value (Fjermestad & Robertson Jr, 2016). It is essential that hotel company managers, in addition to implementing socially responsible business, sustainable development and showing concern for the environment, follow the trends in the development of information technology, especially in communication interaction with guests. CRM plays a vital role in these processes because by correctly segmenting guests, long-term friendly relations with the guest are created, and guests loyal to the brand are recognized as the best promoters. In order to adapt, that is, to harmonize with the information environment and the requirements that informatics sets for management in order not to fall behind the competition, it is necessary to realistically look at the perspective of CRM from a strategic, philosophical, and technological aspect, as well as the capabilities of one's business system. The following figure presents the theoretical framework of the CRM perspective.

Figure 1. The theoretical framework of the CRM perspective
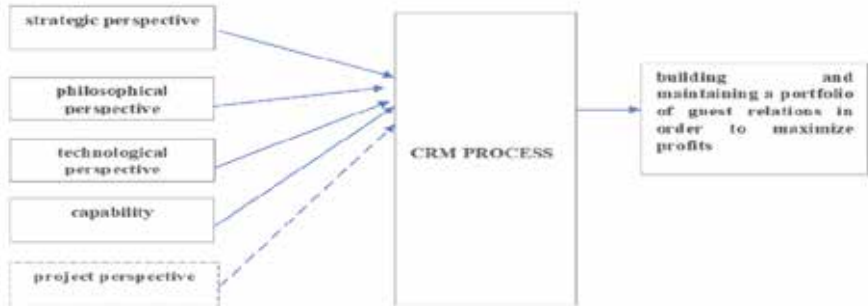
Source: according to Zerbino et al., 2018: 824.

The strategic perspective aims to direct CRM to achieve higher profits for the hotel company while respecting the wishes and demands of the guests with the hotel's capabilities. Allocation of resources for building and maintaining relationships must consistently value regular guests versus new ones. A philosophical perspective counters the need to focus on the guest as one of the primary resources for CRM. Changes in thinking, organizational structure and general understanding of business are inevitable with the adoption of CRM. These include new processes and procedures to be applied and changes in employee behavior, i.e., implementing business process reengineering - BPR. A technological perspective

suggests that CRM tools improve long-term relationships with hotel guests. The success of CRM depends on the degree of correlation between technology, service production process, service quality, hotel employees and guests. Viewed from the perspective of system capabilities, it is suggested that a hotel company possesses a set of synergistic resources: the ability to acquire knowledge about guests and apply them. The system's ability implies managing knowledge about guests to build and maintain long-term relationships through CRM, aiming to maximize profit. In order to specify relevant information management activities, the company should use appropriate IT tools and applications.

Furthermore, the hotel industry, when it comes to creating a database, is at a great advantage because it has easy access to data, given that guests must register, i.e., state their name and address when registering and, depending on the location, other details, so even private information. In addition, guests tend to share their personal preferences with hotel staff in formal and informal conversations. The hotel can use the data collected in this way and in conjunction with IT to provide guests with additional content. For example, a guest who expressed playing tennis as the best form of recreation will receive on his cell phone the availability dates of the tennis court.

If the guest accepts such an offer, the next time, he receives benefits in the form of choosing an appointment, terrain with free equipment, etc. This establishes a close relationship with the guests and fully satisfies their needs. In order to be able to compete in the highly competitive market, the hotel must satisfy all the needs and expectations of the guest. In order to achieve this, hotel management needs to understand the fundamental aspects of business success that ensure satisfied guests become regular and loyal guests. Therefore, to maintain business profitability, achieve complete guest satisfaction, and thus gain loyalty, organizations (hotels) should focus on implementing a customer relationship management (CRM) model. This strategy aims to search, collect, and store the right information, confirm and use them (Banga, Kumar, & Goyal, 2013:71). Clarifying the modalities of success in the hotel market, Dominici and Guzzo (2010:5) consider that it is not enough to focus only on attracting new guests. However, paying more attention to existing guests and applying the "satisfaction and loyalty" policy is necessary. Appiah and Kingsley (2010:39) state that the world economy "is becoming increasingly globalized, competition has intensified, and product differences have faded". As a result, tourism businesses are increasingly focusing on customer relationship management (CRM), which is

becoming a central point of reference for their ability to achieve market leadership and profits. In their conceptual framework, Parvatiyar and Sheth (2001:3) state the two most important processes of CRM, namely the proactive involvement of the guest and the building of partnership relationships with the most important guests. According to Zerbino et al. (2018:9), the development and management of CRM can be represented by the following representation.

Figure 2. Development and management of CRM

The presented image shows five inputs, the formulation derived from a critical analysis of the relationship between each critical success factor (Critical Success Factors - CSF) and the Big Data database.

3. RESEARCH METHODOLOGY

The empirical part of the work relies on quantitative research, more precisely, survey research as a basis for identifying a particular phenomenon, questions in a closed-type survey questionnaire intended for a sample of connoisseurs who are asked to make a strong statement about the questions asked. This research method is particularly effective in looking at the social context of the population and seeking and obtaining information about individuals' perceptions, attitudes, and behaviors. The research was conducted during September and October 2019

by surveying via e-mail known addressees of connoisseurs, i.e., experts relevant to this topic of work. In particular, directors of hotel companies, marketing directors and sales directors, that is, reception managers, were surveyed as people who use information technologies in their regular business and know all the advantages and disadvantages that ICT affects their work performance. The survey questionnaire was created in such a way that respondents were asked to express their views on the elements of integrated communication services in the hotel by assigning ratings, evaluating the functions of the CRM system and its customer support, evaluating the existing and perceived future development elements of CRM, and express opinions about the current state of using ICT, their contribution to business efficiency and competitiveness on the market. In order to achieve the credibility of the sample, an effort was made to ensure the appropriate proportion of respondents from hotels on islands, on the coast, on the continent and in cities. It was also necessary to use respondents from small (up to 100 rooms), medium (from 100 to 200 rooms) and large hotels (over 200 rooms) in the appropriate ratio. Furthermore, it was necessary to ensure equal representation according to the type of business (seasonal, year-round, specialized and apartment). The control variables are age, work experience and level of education, the measuring instrument is a questionnaire with closed-ended questions graded on a Likert scale, and reliability is checked by calculating Chrombachalpha (SPSS 24).

4. RESEARCH RESULTS

The survey questionnaire contained three groups of questions. For this paper, the second group of questions related to evaluating the functions of the CRM system will be processed. The selected sample of respondents, who were asked for answers about evaluating the functions of the CRM system, should be experts and well-versed in the hotel business. In this context, the sample of Croatian hotel respondents was narrowed down to hotel management, i.e., hotel director, marketing director and head of reception (function of sales director). So, it is a relevant sample of well-versed experts in the research topic. According to data from the Ministry of Tourism of the Republic of Croatia on August 31, 2019, the observed population consisted of 814 hotel facilities (hotels and apart-hotels). The survey included 106 hotels, i.e., 13.02%, which constitutes a representative sample, primarily if it is known that smaller hotel facilities use only essential ICT functions. The survey questionnaire addressed those well-versed in ICT appli-

cations in 106 hotels. All respondents (100%) gave a valid answer about their business function and were classified as follows: hotel manager - 30 respondents 28.3%; marketing director – 33 respondents 31.1%; sales director (head of reception) – 43 respondents 40.6%, which indicates an even sample according to the functions the respondents perform in the hotel. The respondent's level of education is essential when giving answers, considering the research topic that requires expertise. Out of a total of 106 respondents, all (100%) stated their level of education as follows: master's or doctorate - 16 respondents (15.1%); higher education – 51 respondents (48.1%); higher education - 39 respondents (36.8%). Closely related to the previous question, the fourth question asked respondents about their work experience in the hotel industry. Out of 106 respondents, all (100%) declared their work experience as follows: up to 5 years - 3 respondents (2.8%); from 6 to 10 years – 28 respondents (26.4%); from 11 to 20 years old – 35 respondents (33.0%); from 21 to 30 years old – 35 respondents (33.0%) over 30 years old – 5 respondents (4.7%), which can be concluded that there is a small share of respondents with the least and most work experience. The research object is a hotel. A hotel is an object in which accommodation and breakfast services are mandatory for guests, and other catering services can also be provided. In order to satisfy the name, the hotel must comply with the Ordinance on the classification, categorization and special standards of hospitality facilities from the group of hotels. Due to its specific geographical location, the Republic of Croatia has hotels in different locations, which in turn depends on the hotel's size, type and purpose. In general, according to location, hotels can be classified as coastal, island, continental and urban hotels. A total of 106 hotel facilities throughout the Republic of Croatia were investigated, and the distribution is as follows: hotels on the continent – 34 hotels (32.1%) located in the central (continental) part of Croatia; hotels on the islands – 16 (15.1%); hotels on the coast – 37 (34.9%); urban hotels – 19 hotels (17.9%) located in major cities of continental Croatia. From this comes the expected, which is that considering the tourist orientation of the Republic of Croatia, there is a more excellent representation of hotels on the coast and the islands than those on the continent.

Furthermore, from the responses received from the respondents, the dominance of small (41.5%) and medium-sized hotels (37.7%) is noticeable, which corresponds to the observed population of hotels in the Republic of Croatia. From the obtained results about a sample of hotels according to the type of business, two types of hotels prevail those that operate throughout the year,

50.9% of them (city and larger tourist centers) and seasonal ones (45.3%). When the responses of the respondents related to the evaluations of the CRM system in the hotel were considered, the respondents were offered to evaluate the following functions of CRM: 1) improvement of guests' orientation towards consumption, 2) improvement of quality service provided, 3) improvement of guest loyalty, 4) improvement competitiveness of the hotel and 5) management of the guest base and immediate feedback. Only users and/or good connoisseurs of CRM functions can reasonably make their judgment about CRM functions. Therefore, all respondents (100%) rated the CRM function as improving the orientation of guests towards consumption.

Chart 1. Frequency and distribution of ratings of the CRM function improving guest orientation towards consumption

Improving the orientation of guests towards consumption		F	%	Histogram of function 1 scores.
	5	2	1.9	
	6	8	7.5	
	7	25	23.6	
	8	31	29.2	
	9	21	19.8	
	10	19	17.9	
	In total	106	100	
$\bar{x}$		8.1132		
Median		8.00		
Mod		8		
SD		1.27482		
Variance σ²		1.625		
Span		5		
Σ		860		
Skewness		-0.132		
Kurtosis		0.465		
Percentile	25	7		
	50	8		
	75	9		
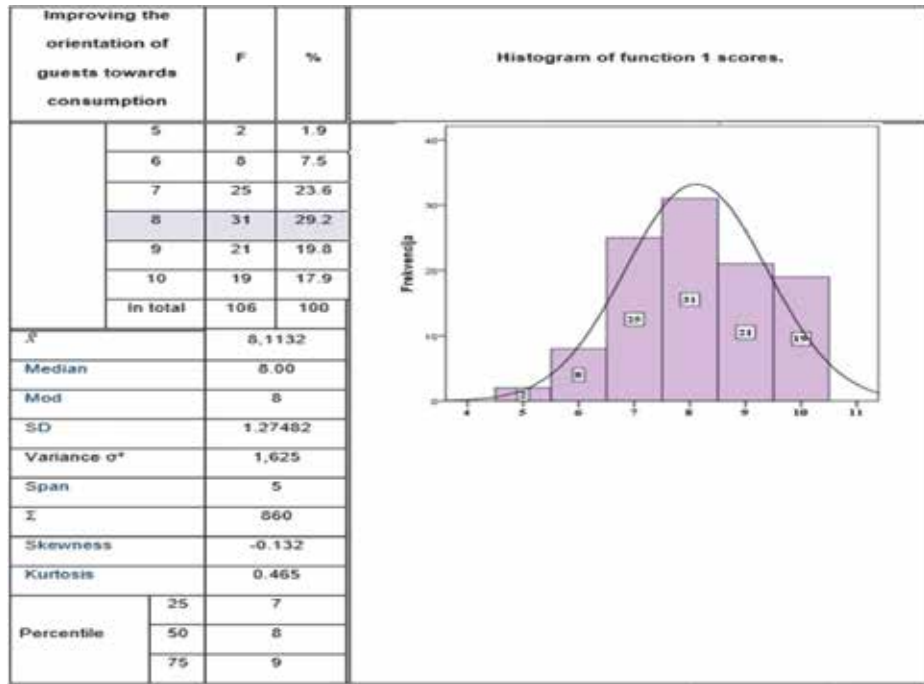
Source: author's processing in IBM SPSS Statistics according to the survey questionnaire data

It can be seen how the respondents evaluated this function in the range of grades from 5 to 10. Two respondents (1.9%) were assigned a grade of 5, while 19 (17.8%) were assigned a maximum grade of 10. Grade 8 was highlighted (29. 2%). It clearly shows how the evaluations of the CRM function improv-

ing guest orientation towards consumption follow a normal distribution. The measure of the normal curve Skewness asymmetry is weak and negative -0.132, indicating a very weak shift towards higher grades. The measure of curve flattening is Kurtosis, which has a value of 0.465, which indicates weak leptokurtic, which is reflected in the grouping of results around the arithmetic mean. Respondents evaluated the observed CRM function with an average score of 8.1132, a standard deviation of 1.24782, and a variance of 1.625. The following graphic shows how respondents evaluated the observed function of CRM from the point of view of position and age, as well as the location and size of the hotels included in the survey. The distribution of evaluations of the function of improving the orientation of guests towards consumption according to a) position and b) age of the respondents and c) location, and d) the following complex graphic representation represents the size of the hotel.

Chart 2. Distribution of evaluations of the function of improving the orientation of guests towards consumption according to a) position and b) age of the respondents and c) location and id) size of the hotel

Source: author's processing in IBM SPSS Statistics according to the survey questionnaire data

It is noticeable how the grades are distributed concerning the normal curve. From the point of view of the position, the best average ratings were given to marketing directors (8.5), followed by heads of reception (8.1) and general directors (7.8). According to age, the best average ratings were given by respondents from the group 46-55 years old (8.4) and the lowest (7.3) from the group "more than 56 years old". According to the hotel's location, the best average ratings were on the coast (8.6) and the lowest on the islands (7.5). According to the size of the hotel, the best ratings were given by respondents from smaller hotels (8.1), while the lowest ratings came from large hotels (7.4). Improving the quality of the provided service is one of the functions of CRM, which is primarily directed towards the service provider, i.e., the hotel. How much and to what extent CRM is responsible for improving the quality of the service provided was evaluated by the respondents. Of the 106 respondents, 105 (99.1%) rated the CRM function as improving the quality of the service provided, while one respondent (0.9%) did not answer.

Chart 3. Frequency and distribution of evaluations of CRM function improvement of service quality
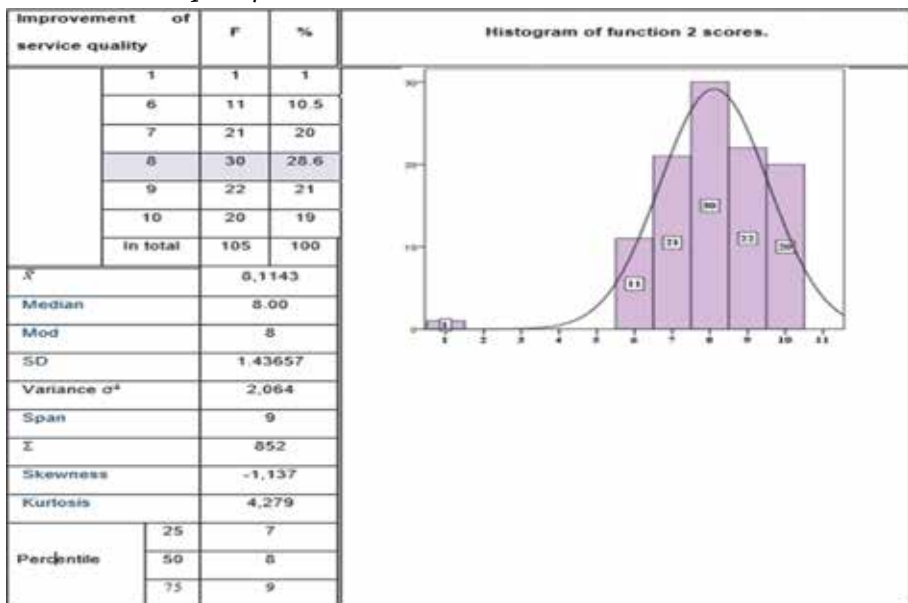
Improvement of service quality		F	%	Histogram of function 2 scores.
	1	1	1	
	6	11	10.5	
	7	21	20	
	8	30	28.6	
	9	22	21	
	10	20	19	
	In total	105	100	
$\bar{x}$		8,1143		
Median		8.00		
Mod		8		
SD		1.43657		
Variance σ^2		2,064		
Span		9		
Σ		852		
Skewness		-1,137		
Kurtosis		4,279		
Percentile	25	7		
	50	8		
	75	9		

Source: author's processing in IBM SPSS Statistics according to the survey questionnaire data

Moreover, the respondents evaluated this function in grades from 1 to 10. One respondent (1.0%) was assigned a grade of 1, while 20 respondents (19.0%) were assigned a maximum grade of 10. Grade 8 was highlighted (28.6%). The attached histogram clearly shows how the CRM function evaluations and the provided service's quality improvement follow a normal distribution. The measure of the normal curve Skewness asymmetry is pronounced and negative -1.137, which indicates a pronounced shift towards higher grades. The measure of curve flattening is Kurtosis, which has a value of 4.279, which indicates pronounced leptokurtic, which is reflected in the grouping of results around the arithmetic mean. The respondents rated the observed CRM function with an average score of 8.1143 with a standard deviation of 1.43657 and a variance of 2.064. CRM is designed to encourage the improvement of guest loyalty and is expected to be the most frequently questioned function. Out of 106 respondents, 104 (98.1%) rated the CRM function as improving the quality of the service provided, while two respondents (1.9%) did not answer.

Chart 4. Frequency and distribution of ratings of the CRM function improving guest loyalty
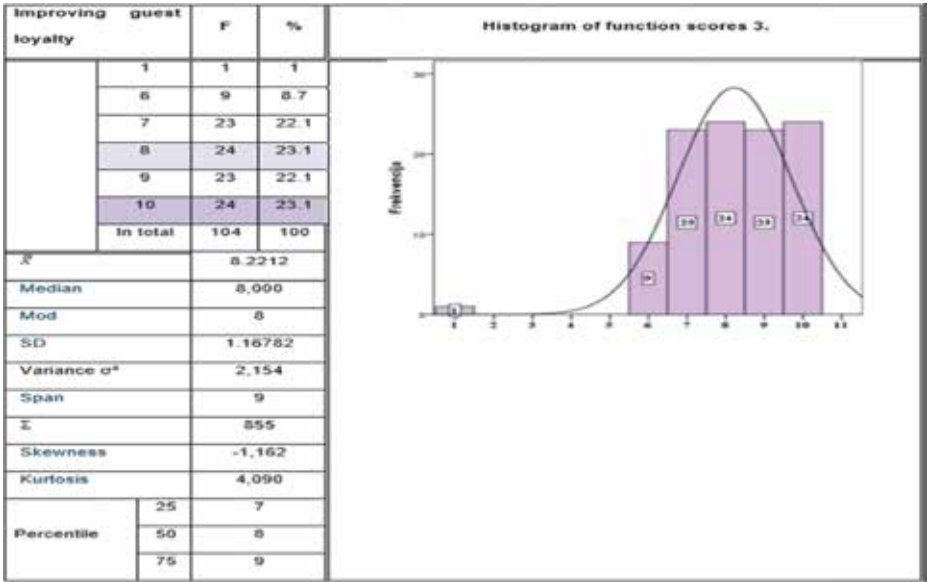
Improving guest loyalty		F	%	Histogram of function scores 3.
	1	1	1	
	6	9	8.7	
	7	23	22.1	
	8	24	23.1	
	9	23	22.1	
	10	24	23.1	
	In total	104	100	
$\bar{x}$		8.2212		
Median		8.000		
Mod		8		
SD		1.16782		
Variance σ^2		2.154		
Span		9		
Σ		855		
Skewness		-1.162		
Kurtosis		4.090		
Percentile	25	7		
	50	8		
	75	9		

Source: author's processing in IBM SPSS Statistics according to the survey questionnaire data

Respondents evaluated this function in the range of grades from 1 to 10. One respondent (1.0%) was assigned a grade of 1, while 24 respondents (23.1%)

were assigned a maximum grade of 10. Grades 7, 8, 9 and 10 were equally distributed. Which in total make up 90.4% of all grades. The attached histogram clearly shows that the evaluations of the CRM function improving guest loyalty do not follow a normal distribution. The measure of the normal curve Skewness asymmetry is pronounced and negative -1.162, indicating a marked shift towards higher grades. The measure of curve flattening is Kurtosis, which has a value of 4.090, which indicates pronounced leptokurtic, which is reflected in the grouping of results around the arithmetic mean. Respondents evaluated the observed CRM function with an average score of 8.2212 with a standard deviation of 1.1678 and a variance of 2.154. The following graphic shows how respondents evaluated the observed function of CRM from the point of view of position and age, as well as the location and size of the hotels included in the survey. Improving the hotel's competitiveness is a CRM function primarily directed towards the service provider, i.e., the hotel. How much and to what extent CRM is responsible for improving the hotel's competitiveness was evaluated by the respondents. All 106 respondents (100%) rated the CRM function as improving the hotel's competitiveness.

Chart 5. Frequency and distribution of evaluations of the CRM function improving hotel competitiveness
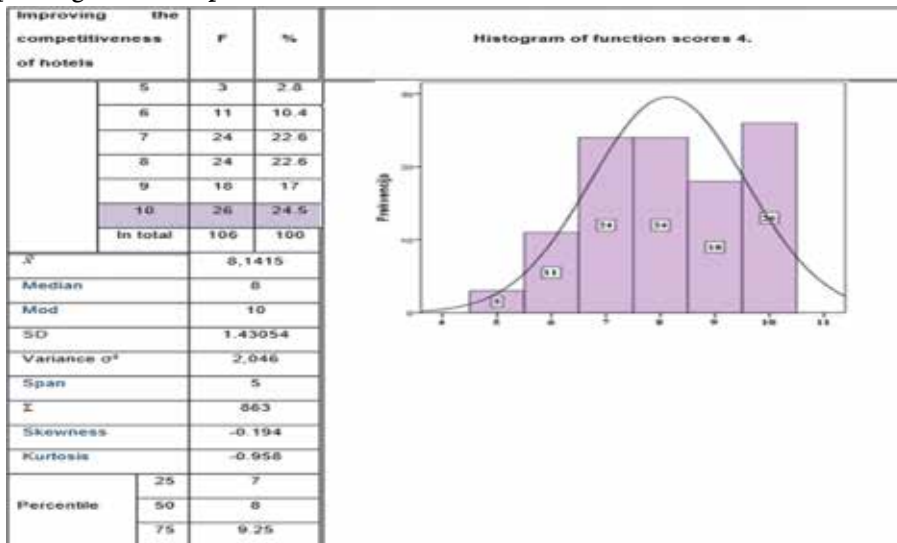
Improving the competitiveness of hotels		F	%
	5	3	2.8
	6	11	10.4
	7	24	22.6
	8	24	22.6
	9	18	17
	10	26	24.5
	In total	106	100
$\bar{x}$			8,1415
Median			8
Mod			10
SD			1.43054
Variance σ^2			2,046
Span			5
Σ			863
Skewness			-0.194
Kurtosis			-0.958
Percentile	25		7
	50		8
	75		9.25

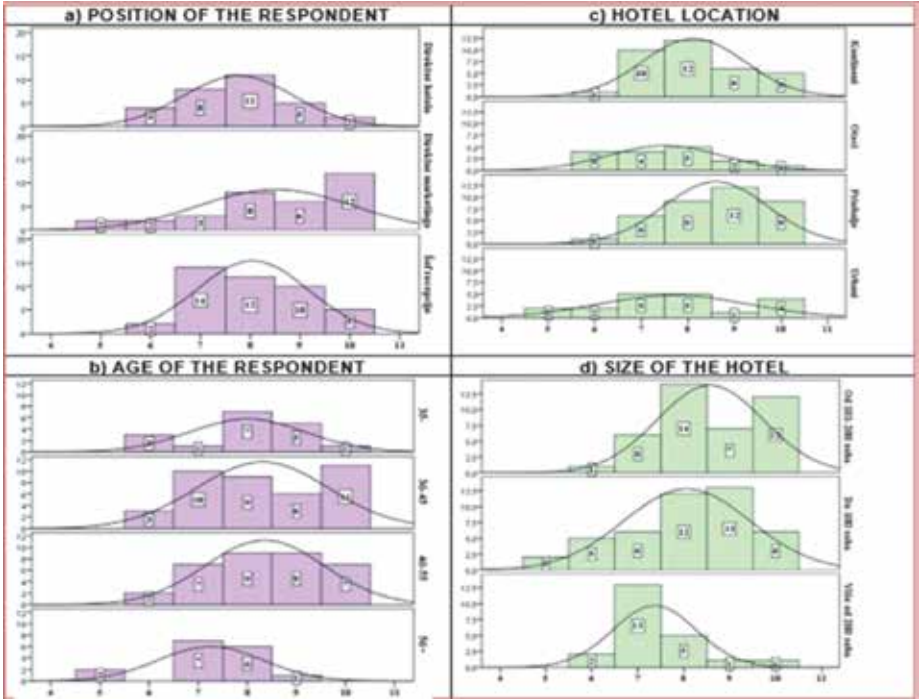**Source:** author's processing in IBM SPSS Statistics according to the survey questionnaire data

Respondents evaluated this function in the range of grades from 5 to 10. Three respondents (2.8%) were assigned a grade of 5, while 26 respondents (24.5%) were assigned a maximum grade of 10. Grades 7 and 8 are highlighted (a total of 45.2 %). The attached histogram clearly shows how the evaluations of the CRM function improving the hotel's competitiveness follow a normal distribution. The measure of the normal curve Skewness asymmetry is weak and negative -0.194, indicating a weak shift towards higher grades. The measure of curve flattening is Kurtosis, which has a value of -0.958, which indicates moderate platykurticity, which is reflected in the grouping of results around the arithmetic mean. Respondents evaluated the observed CRM function with an average score of 8.1415 with a standard deviation of 1.43054 and a variance of 2.064. Managing the guest database and directly obtaining feedback is a CRM function on which all further marketing activities are based. A quality database and an appropriate software application are the guarantors of the success of CRM implementation in the hotel. All 106 respondents (100%) rated the CRM function as improving the hotel's competitiveness as a CRM function guest database management respondents evaluated in the range of grades from 6 to 10. Eleven respondents (10.4%) were assigned a grade of 6, while 27 respondents (25.5%) were assigned a maximum grade of 10. Grades 7 and 8 are highlighted (a total of 47.2 %). The attached histogram clearly shows how the ratings of the CRM function of guest database management follow a normal distribution. The measure of the asymmetry of the normal curve, Skewness, is very weak and negative – 0.057, which indicates a weak shift toward higher grades. The measure of curve flattening is Kurtosis, which has a value of -1.219, which indicates moderate platykurticity, which is reflected in the grouping of results around the arithmetic mean. Respondents evaluated the observed CRM function with an average score of 8.2358 with a standard deviation of 1.34201 and a variance of 1.801. Analogously to the analyzed elements of integrated information and communication services in the hotel, the functions of the CRM system are also analyzed. The analysis of variance ANOVA is used to investigate the connections between individual variables (functions). The connection by type of hotel will be explored.

Table 1. Variance analysis of CRM function ratings by type of hotel

Type of hotel		Improving the orientation of guests towards consumption	Improvement of service quality	Improving guest loyalty	Improving the competitiveness of hotels	Guest database management
Congressional	$\bar{x}$	8.6667	9.0000	9.0000	8.6667	9.0000
	% of N	2.8%	2.9%	2.9%	2.8%	2.8%
Aparthotel	$\bar{x}$	7.0000	9.0000	9.0000	8.0000	9.0000
	% of N	0.9%	1.0%	1.0%	0.9%	0.9%
Year-round	$\bar{x}$	7.7407	7.6852	7.9615	7.7222	7.9815
	% of N	50.9%	51.4%	50.0%	50.9%	50.9%
Seasonal	$\bar{x}$	8.5208	8.5319	8.4375	8.5833	8.4583
	% of N	45.3%	44.8%	46.2%	45.3%	45.3%

Source: author's processing in IBM SPSS Statistics according to the survey questionnaire data

As can be seen from the ANOVA table, the calculated F values are less than the tabular F by 5% of statistical significance for the function's improvement of guest orientation towards consumption, improvement of service quality and improvement of hotel competitiveness, which in these cases spoke to the positive evenness of the rating distribution regardless of the type of hotel. In contrast, in improving guest loyalty and managing the guest database, the evaluation depends on the respondents' hotel type. According to the detected differences observed during the interpretation of the results, an analysis of the correlation of the mean values of the observed five CRM functions in the hotel is performed.

Table 2. Correlation of average ratings of CRM functions

Function	CRM functions	CRM functions 1	2	3	4	5
1	Improving the orientation of guests towards consumption	1	0.719	0.528	0.602	0.558
2	Improvement of service quality	0.719	1	0.589	0.557	0.532
3	Improving guest loyalty	0.528	0.589	1	0.704	0.657
4	Improving the competitiveness of hotels	0.602	0.557	0.704	1	0.771
5	Guest database management	0.558	0.532	0.657	0.771	1

Source: author's processing in IBM SPSS Statistics according to the survey questionnaire data

The correlation was calculated using the Pearson correlation coefficient, which recognizes the connection if the coefficient is more significant than 0.5. This confirms the relevance of experts, considering that the elements of internal advertising services are created in a way that they work in a coordinated manner.

5. CONCLUSION

It can be concluded that CRM is a process that includes all activities for long-term, profitable, and mutual creation of favorable relations with clients. From the perspective of the hotel business, it is a process limited to managing interactions with guests to establish and maintain lasting relationships. In the sense of the above, hotel companies should design and prioritize all resources in building relationships and maintaining the value that is created from these relationships. Potentially, an additional competitive advantage that CRM can provide is related to the capacity to gather and act on knowledge about current and potential guests, for example, by proactively reshaping customer interactions. A problematic limitation in the work that comes to the fore in collecting the opinions and attitudes of hotel managers about the use and experiences with CRM is found in the fact that Croatian hoteliers have not yet accepted the possibilities that modern information technologies provide in managing relations with guests. Some of the forms of CRM have been implemented in large high-category hotels, while in medium-sized hotels, this application is only sporadic. Most managers believe that the mere presence in the network space is enough, and they equate customer relations with reservation applications. Therefore,

the sample is relatively small but undoubtedly representative of the population. The authors want to emphasize that there is a research problem always present when surveying by e-mail addresses, and that is, in fact, that of some respondents. However, anonymity is indicated and guaranteed, reluctantly deviating from the declared positions represented by their institutions or employers, which indicates that some deviations should be accepted with a certain reserve. In conclusion, the authors suggest that future research should generate the attitudes of guests and hotel employees, which would enable a comparison with the analyzed attitudes of hotel managers, to look at the differences in attitudes from the aspect of conflicting interests, to detect differences in the expectations and willingness of different stakeholders to participate and cooperate to create better performance results relationship.

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Andreja Rudančić • Edvard Badurina • Sandra Sokčević: THE USE OF THE CRM MODEL AS A COMPETITIVE ADVANTAGE OF CROATIAN HOTEL...

BUSINESS COMMUNICATION STYLES OF GENERATION Z: FROM UNIVERSITY TO THE LABOR MARKET

Helena ŠTIMAC, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business Osijek

E-mail: helena.stimac@efos.hr

Ivana PIPERKOVIĆ
I CORNER, marketing agency

E-mail: ivana.piperkovic1@gmail.com

Abstract

Successful communication plays a significant role in everyday life and business, and participants are influenced by the communication skills they build based on their communication style. Generation Z is the first generation to grow up in the digital age fully, and for them, social media and technology are an integral part of their lives. Their experience with digital technology shapes their communication style. The research problem is based on the question of whether the labor market should adapt to Generation Z and whether there are differences in behavior that should be considered when hiring Generation Z. The aim of this paper is to find out which communication style Generation Z belongs to, since this generation is the one that enters the labor market or is already present in the market to a small extent. The study was conducted with 145 Generation Z students. Using an exploratory factor analysis, four communication styles (the passive, the aggressive, the assertive, and the passive-aggressive or manipulative styles) were identified that describe Generation Z's behavior. The results showed that students who work alongside their studies and regularly communicate and negotiate professionally are more assertive. Students with lower grade point averages have a more manipulative communication style, while a more aggressive communication style occurs among students who attend classes less frequently. So, companies today need to adapt to

Generation Z, as they are individuals who do not like to change and follow rules to communicate, negotiate and resolve conflict situations successfully.

1. INTRODUCTION

The 21st century is characterized by accelerated technological advancement, and the internet has become an unavoidable part of everyday life. This mainly refers to those who have grown up with technology, like Generation Z (Gen Z) (Štimac et al., 2022). Gen Z comprises people born between 1996 and 2010. This generation's identity has been shaped by the digital age, climate anxiety, a shifting financial landscape, and COVID-19 (McKinsey, 2023). This generation is also called the digital generation, which represents the largest generation in the world. Technology implementation in everyday life is reflected in the communication style used by the people born in that period. Since communication is subject to changes, the development of technology has changed the characteristics of communication. Every generation has different people who communicate in different ways. This is why it is difficult to generalize and determine Gen Z's communication style, which is specific for every individual.

"Gen Z are extremely passionate community builders, and they are great at connecting with like-minded people who want to build something great together" (Forbes, 2021).

On the other side, Gen Z is the generation that learned to communicate digitally via text messages or video calls and by using social platforms to connect and communicate. Using the Internet as the primary source of information and social networks as the new way to communicate and connect to people is the main feature of Gen Z. Gen Z has communicated via telephone calls, and they prefer one-on-one communication (Wilmes, 2023). Nguyen (2023) states that 72% of Gen Z prefer in-person communication with their boss and colleagues, and 40% of Gen Z employees expect daily feedback on their performance.

Raslie (2021) published a study presenting research results and a comparative analysis of Gen Z and Gen Y communication styles. The results show how "Gen Z were amiable communicators who were low on assertiveness, prioritized relationship over the task in task completion, and had a slow-paced com-

munication style" Furthermore, the same author states that the research results did not show any influence of Gen Z's socio-demographic indicators on the style of communication and that employers should be highly transparent toward Gen Z individuals and present their expectations. Gen Z tends to prefer open and transparent communication, and they are open to different ideas and perspectives and expect to be allowed to express their opinion. They also favor cooperation and teamwork and seek a balance between their needs and the community's interests.

The use of mobile devices has also led to specific changes presented as indifference and lack of concern for certain societal norms. Gen Z like to use abbreviations and emoticons to express their feelings. The new method of everyday communication in society is the difference in communication by using not only sentences, but also emojis, GIFs, and other visual elements to convey their thoughts and feelings.

Gen Z is the generation whose parents are Gen X, who value practicality and have self-confidence. This means that this segment, which is related to the decision-making process, has been transferred to Gen Z. Both generations are more concerned with higher education's practical and tangible benefits (Hughes, 2022). Freedom to express their positions and opinions on many topics and the disappearance of "tabu" topics have been integrated into their lives.

This raises the question of which style of communication is used by Generation Z, are they adaptable, do they assert their opinion aggressively, or do they respect the opinions of others? This is the specific reason why this paper aims to identify the communication style used by Generation Z, whether they use multiple styles, and whether Generation Z's socio-demographic factors affect their communication style.

2. COMMUNICATION

Communication, as the process of exchanging information, ideas, thoughts, feelings, attitudes, perceptions, beliefs, values, and personality, is an indispensable part of every individual. Every person, by their very existence, communicates differently. Rouse and Rouse (2005: 26) have said, "communication is the process of conveying a message from one person to another." Communication is efficient if it occurs in both directions and if all the participants receive and

send messages equally. Samovar et al. (2015) believe that human communication conveys symbols to elicit a reaction.

Fox (2006) believes that a person displays the knowledge and the art of communication in many necessary aspects of life, from social to professional. It indicates the importance of communication skills acquired early in life and perfected as a person matures. The ability to communicate well and good communication skills contribute to an individual's progress in their relationships with other people, which ultimately affects their business success and satisfaction.

Even though a person primarily communicates verbally because people are social creatures and require communication, most communication is still painted by non-verbal communication. Non-verbal communication is present in a person's life for more than 60%, even up to 93%, which indicates the importance of this type of communication (Navarro & Karlins, 2008). Verbal and non-verbal communication should synergize, be harmonious, and not stand opposite. Only then will the message being sent become convincing and gain truthfulness, importance, and comprehensibility. However, while the verbal part is firmly under the person's control, non-verbal communication, such as gestures, facial expressions, body position, and posture, is something only the most skilled people can keep under complete control.

Everyday life, which includes both a professional and a private segment, is impossible without communication. Therefore, successful communication depends on the individual, their positions, emotions, thoughts, prejudices, and desires. Successful communication is impossible if these segments are not in synergy and positive. Good communication creates successful teams, where interpersonal relations are a segment in a business process that also results in a specific effect. However, the crucial factor in efficient communication, the thing that creates good relationships, is listening. Tubbs and Moss (2007) have presented three typologies of listening:

1. Listening for pleasure, which is related to focus in conversation and less related to actions (it occurs in situations when people are watching films or television, listening to music, or enjoying some other form of entertainment);
2. Discriminative listening, which is used for understanding and remembering (it occurs in situations when we are at work, in class, and other situations);

3. Critical listening is when a person believes that a choice must be made, and the message is evaluated as accepted or rejected.

Tomić and Jugo (2021) have defined social skills as recognizable, learned behavior that individuals use in interpersonal situations to gain or maintain understanding and support from their community. Children learn to communicate with their parents, teachers, and the community and project the same behavior pattern toward the outside world. Educational institutions are a part of the process of creating a style of communication and a part of the culture that also represents a part of the rules of conduct in an institution. The appearance and development of digitalization have led to changes in life and communication from its original form. Communication itself is subject to changes due to the appearance of new technologies, and it depends on several factors and requires new competencies or language abilities from its participants (Stolac & Vlastelić, 2021).

2.1. MASS AND INTERNET COMMUNICATION

Mass communication appeared in the second half of the 19th century with the appearance of the printed press as the first medium of mass communication. Technological changes have also influenced the transformation of mass communication, particularly with the appearance of the Internet. One of the features of this form of communication is indirectness, and digitalization and technological progress are the factors that enabled the development of this form of communication. Keči-Isaković (2006) considers that mass communication refers to normally complex formal organizations for their activity directed at a mass audience. Mass audience means that contact is established with many people. A negative trend in the development of mass digital communication is the depersonalization of society – a decreasing number of personal contacts and less developed social capital – something encountered by Generation Z.

The appearance of the Internet has ushered in a new age of communication which is growing fast and transforming the world into a global village. The limitations to communication have been removed, which has also enabled automatic two-way communication. Transfer and speed of information are creating new forms of communication. It is unimaginable for people today, especially young people in developed and developing countries, that they could live without the Internet. Mobile phones have become a necessity without which everyday ac-

tivities become impossible. "All the media are increasing the flow of information, but it appears that the Internet is particularly suitable for that. The Internet is called the information highway" (Klotz, 2001: 186). The Internet has become a tool without which our everyday lives cannot function. Countries are turning to digitalization which facilitates situations, particularly in business, and Generation Z has embraced digital work as something necessary and indispensable.

2.2. Styles of communication

Communication as a process is impermanent, fast, and adaptable. Diction plays a significant role in the transfer of information verbally, and the tone and the timbre of the voice used to convey a message are often critical. Every person is unique, so they all have their communication styles. The communication style itself may be changed because communication is a skill that can be learned and practiced. Self-control is essential for specific communication styles because maintaining objectivity in transferring and receiving information is a style of good communicators, orators, or rhetoricians.

Throughout their lives, every person will adopt a particular style of communication that will characterize them as a person and differentiate people who are withdrawn, aggressive, assertive, or complex. A style may also be intentionally chosen, depending on which style will most effectively accomplish the required goal. The choice depends on the other person in the conversation, the goals, and the surroundings where the communication occurs. Antolović and Sviličić (2020) have presented the four most used styles of communication in various situations: the passive style, the aggressive style, the assertive style, and the passive-aggressive or manipulative style. Each of those has been elaborated on below.

The passive style of communication is characteristic of withdrawn or introverted persons. Such an individual will often keep their opinions to themselves, they will carry their emotions quietly, and they will not feel the need to advocate their views. Such a person wants to express their position, but they hope someone else will carry this communicative burden. They struggle with themselves, their own emotions, and their fears. More than 80% of people will not say a word to fight for their rights or satisfy their needs (Lamza-Maronić & Glavaš, 2008). Passive persons tend to believe that other people do not cause them harm intentionally. They tend to take the path of least resistance when

faced with choices in life. Sometimes this is an issue of low self-esteem and a lack of confidence. Being closed off and alone is where they feel the safest, and they often seek such conditions. They believe they have no control over their own lives, and sometimes it is easier for them if someone else takes control over the challenges in their lives. Courage is a concept that passive communicators lack. Antolović and Sviličić (2020) have stated that the passive communication style is the opposite of the aggressive one. Such persons are reserved, less eloquent, and rarely speak up during conversations or discussions.

The aggressive communication style is where the person is always in the dominant role, often an extroverted person. An aggressive communicator is the loudest person in the room. Their constant need to be the center of attention is so prominent that even the person cannot control it. Such people are always right. They always know everything, and they always need to express their opinion. Their fight for their rights is characterized by an aggressive approach to communication and by ignoring the positions and feelings of the other participants in communication. During communication, they do not respect personal space and gesticulate aggressively. They do not accept other people's and other people's opinions unless they agree with their position. Aggressive individuals are harmful to others and themselves because they destroy their relationships with other persons (Lamza-Maronić & Glavaš, 2008). In the aggressive communication style, a person speaks in elevated tones and uses non-verbal cues that convey the desire for dominance. They get close to other people's faces, gesticulate impatiently and intensively, occupy much space, etc. Verbal cues are also used, including persistent interruptions of other people, speaking over others, and displaying disinterest in listening (Antolović & Sviličić, 2020: 47). Their laughter is the loudest, and they often wear the mask of the "collective clown, the merry person." However, in the background, there is something completely different. Such people are insecure about themselves and struggle with their fears, doubts, and complexes. They cannot control this, leading to the use of an aggressive and dominant communication style, believing that this is something they can control, but this is only an illusion. In most situations, repressed rage and complexes tend to surface, and such a person can no longer control themselves.

The assertive communication style is characteristic of persons with very high self-control. These people express their feelings, thoughts, and positions clearly. They regard and respect other people but also themselves. They can find

harmony in relationships calmly. They speak calmly, and they make eye contact. They are excellent listeners in the communication process. As they protect themselves, they strengthen and guard their self-confidence. Such a person is aware that the only corner of the universe that they can change and affect is themselves. They do not want to change others; they strive toward reaching a common accord. Assertive persons' non-verbal communication is recognizable by maintaining eye contact, calm and polite communication, clear and direct presentation of their positions, offering compliments to others, and being excellent listeners. The assertive style offers the option of having everyone fight for themselves, speak their mind clearly and directly, and not cause any harm to themselves or others. It enables fast and straightforward communication, which becomes efficient. Assertiveness can be learned, but it requires more effort than other forms of behavior (Antolović & Sviličić, 2020: 48).

The manipulative or passive-aggressive communication style is used by people who are calculating to a certain extent. Everything a person does in life is exclusively motivated by certain interests. Such a person exerts a large amount of subconscious influence toward the person they are talking to, and they sometimes control the situation. By controlling the conversation partner and the situation, the person can manipulate and get what they are after. According to Antolović and Sviličić (2020: 47), the combination of the passive-aggressive style in communication seems contradictory at first glance. It is composed of an aggressive style, presented through passive behavior. Namely, it is presented when a person behaves as if they are taking a passive position but are communicating an aggressive tendency present behind such behavior. It is best described by the saying: Saying one thing, doing another.

3. RESEARCH DESIGN

The research has been conducted on a sample of 145 Gen Z participants (students) during 2021 and 2022. Participation in the research was anonymous, and all the participants were familiarized with the research aim. The survey offered 60 statements about the participants' behavior, each linked to a specific communication style (aggressive, passive, manipulative, or assertive). For each statement, the participants used the Likert scale of agreement or disagreement with the specific statement in the following manner: 1 = completely disagree, 2 = partially disagree, 3 = neither agree nor disagree, 4 = partially agree, 5 =

agree. The second part of the survey was related to the participants' socio-demographic information.

The research aims were the following:

1. To determine the communication styles used by Gen Z, who are still not a part of the labor market and a part of the higher education system.

2. To analyze the communication styles based on gender, status, specialization, percentage of class attendance, grade point average, employment, and negotiating experience.

Based on the stated aims, the following hypotheses have been posed:

H0 There is a statistically significant correlation between the students' socio-demographic indicators and communication styles.

H1 There is a statistically significant correlation between the students' gender and communication styles.

H2 There is a statistically significant correlation between the students' status and communication styles.

H3 There is a statistically significant correlation between the students' specialization and communication styles.

H4 There is a statistically significant correlation between the students' class attendance percentage and their communication styles.

H5 There is a statistically significant correlation between the students' grade point average and their communication styles.

H6 There is a statistically significant correlation between the students' (lack of) employment and communication styles.

H7 There is a statistically significant correlation between the students' negotiating experience and communication styles.

The sample description is presented below; it shows the distribution among Gen Z, considering their socio-demographic indicators (Table 1).

Table 1. Description of the sample

		N	%
Gender	Male	46	31.7
	Female	99	68.3
Student status	Full-time	125	86.2
	Part-time	20	13.8
Specialization/Major	Financial Management	49	33.8
	Marketing	43	29.7
	Entrepreneurial Management and Entrepreneurship	12	8.3
	Business Informatics	21	14.5
	Trade and Logistics	20	13.8
Class attendance	0%	3	2.1
	0-25%	3	2.1
	26-50%	13	9
	51-75%	36	24.8
	76-100%	90	62.1
Study results (grade point average)	2.0 – 3.0	9	6.2
	3.1 – 4.0	111	76.6
	4.1 – 5.0	25	17.2
Workplace	Through the student service	42	29
	Employed	8	5.5
	Do not work anywhere	95	65.5
Have you ever negotiated?	Yes, at work	23	15.9
	In everyday situations	98	67.6
	No	4	14.5

Source: authors' research

The results were processed using the SPSS software, and the tools used were descriptive statistics, factor analysis, analysis of variance (ANOVA), and comparative analysis.

3.1. Research results

The initial set of 60 variables has been subjected to exploratory factor analysis. For the analysis, the methods used were the Extraction Method: Principal Component Analysis and the Rotation Method: Oblimin with Kaiser Normalization. After reducing specific variables, which were "non-functioning" variables, the factor analysis yielded four factors with 31 variables in total. The total Cronbach's Alpha is 0.771, KMO is 0.729, the Bartlet test indicates 442.134, df = 465, sig. = .000, and 42.7% of the variance can be attributed to the effect of the four extrapolated factors (Table 2).

Table 2. The results of the extrapolated factor analysis of Gen Z personal behavior

	Factors			
	1	**2**	**3**	**4**
Factor 1: Assertive style of communication				
If I disagree, I am confident enough to say it and stand up for myself	.764			
I can be myself, and people accept me	.671			
When I decide on something, I do it	.649			
I am not afraid of danger and risky challenges	.598			
I consider myself quite skillful and clever in relationships	.594			
I am not afraid to present my opinion if the people I am talking to disagree	.582			
I am not afraid to speak publicly	.581			
I know how to convince people and make them agree with my ideas	.577			
I prefer to be direct	.573			
I am ambitious and ready to do everything required to achieve my goals	.572			
I know how the system works, and I use it as guidance: I am resourceful	.557			
I am not easily intimidated	.542			
I prefer being a wolf to being a sheep	.457			
I usually know whom to contact and when to contact the right person – this is important to achieve success	.453			
Factor 2: Manipulative style of communication				
I often gain the upper hand by intimidating people.		.720		
I do not tend to be authoritative and brusque.		.664		
If someone does something to me that I do not like, I know how to get back at them.		.655		
Manipulating others is often the way to get what you want,		.587		
When criticizing someone, it is efficient to accuse them of being unprincipled. They will agree, of course.		.576		
I consider manipulation to be an effective solution,		.575		
I advocate my rights without respecting the rights of others,		.436		
Factor 3: Passive style of communication				
I do not like to have a bad reputation.			.685	
I believe that a problem can be solved only if the causes are known.			.630	
Once a discussion starts, I prefer to wait and see where the discussion will go.			.554	
Using and emphasizing my integrity is a good way to garner trust.			.530	
Discovering one's intentions prematurely is clumsy.			.513	
Factor 4: Aggressive style of communication				
I tend to put off the work that I should do immediately.				.822
I often put off work that I could do immediately.				.821
I often shock people with my statements.				.478
I have problems with authority, and I demand to be respected.				.433
I have difficulty controlling how long I talk.				.371
Eigenvalue	5.557	3.466	2.189	2.049
Explained variance by factor (%)	17.927	11.181	7.062	6.611
Number of variables in the factor	14	7	5	5

Source: authors' research

As shown in the previous table, four factors have been extrapolated considering that the theory also indicates the distribution of styles of communication (assertive style of communication, manipulative style of communication, passive style of communication, and aggressive style of communication). Furthermore, correlation analysis and the analysis of variance have been conducted, which determined the statistically significant correlations between individual styles of communication and the Gen Z participants' socio-demographic indicators (Table 3). The table only shows the statistically significant correlations, while the correlations which are not statistically significant have not been shown.

Table 3. Statistically significant indicators between the styles of communication and the participants' socio-demographic indicators

	Assertive	Manipulative	Passive	Aggressive
Class attendance	-		-	r=-.204* p=.014 $x^2 = 1.1$
Grade point average	-	r=-.178* p=.032 $x^2 = 1.18$	-	r=-.171* p=.039 $x^2 = 1.17$
Negotiating experience	r=-.252** p=.002 $x^2 = 1.4$	-	-	-

*Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).
Source: authors' research

The information from the table suggests that the passive style of communication is not statistically significant regarding any socio-demographic variables and that there are statistically significant correlations for three styles of communication in the following manner:

- Assertiveness is more visible for 15.9% of participants who negotiate at work (are employed), and it is least visible for 14.5% of participants who have never negotiated.
- A higher level of manipulation is visible for participants with lower grade point averages, while it is less present for participants with higher grade point averages. Therefore, as the grade point average increases, their level of manipulation drops.
- For the aggressive communication style, the results have shown that most participants (76.6%) with a grade point average between 3.1 and 4.0 behave more aggressively toward people with lower and higher-grade

point averages. In addition, aggressiveness is more expressed in students who attend classes less frequently.

4. DISCUSSION

Accordingly, to the research results, it can be concluded that only hypotheses H4, H5, and H7 have been confirmed, while the other hypotheses were not. Therefore, it has been confirmed that there is a statistically significant correlation between the participants' communication style and the frequency of their class attendance, grade point average, and negotiating experience.

Theory, but also research results, have indicated four different styles of communication which are used most commonly and are also used by Gen Z. The results of previous research have indicated that there is no connection between the communication styles and socio-demographic indicators for Gen Z and Gen Y (Raslie, 2021). However, the results of this research indicate individual statistically significant correlations. Assertiveness is more visible for participants who negotiate at work (including participants who are studying and working simultaneously). Participants with lower grade point averages are more manipulative, and those who attend classes less are more aggressive.

5. CONCLUSION

Everyday communication between students plays a significant role in their preparation for the labor market. Students often use various communication styles while acquiring knowledge and skills required for their future employment. In higher education, students face numerous tasks and obligations, and different communication styles can often be observed in that stage. Gen Z is the generation that is still not fully present in the labor market, and it is necessary to explore which styles of communication they commonly use in order for the labor market to be able to adapt (not only future employers but also marketing experts who create campaigns and marketing messages). Successful communication and the use of the appropriate style of communication are critical factors in the labor market. Employers value students who can express their ideas clearly, listen to others, adapt to different conversation partners, and build productive relationships with their colleagues and clients. Therefore, developing communication skills and awareness about different communication styles dur-

ing one's studies may be a key factor for successfully entering the labor market. The labor market should be ready for new challenges brought on by Gen Z, prioritize relationships, not assignments, and change the method of communication, considering that they are the generation that prefers communication via video and text messages and does not prefer telephone conversations. Communication skills are built and developed over the years, as experiences are evident in the research findings, and assertiveness increases as students enter the labor market. In addition, students who take their studies seriously and work on themselves do not need manipulation and aggression because they are more aware of their qualities and opportunities, which also increases their success and relationship-building in the labor market.

One of the limitations of this research is the sample, considering the population size of Gen Z; therefore, the proposal for future research is to increase the sample size. A further limitation is a focus on Gen Z; therefore, future research aims to investigate which communication styles other generations use and compare the results.

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COMPANY AGE AS A FACTOR INFLUENCING TOP MANAGEMENT IN THE CONTEXT OF NEW TECHNOLOGY ADOPTION

Ivana MARTINČEVIĆ, Ph.D.[1]
University North,
Department for Logistics and Sustainable Mobility

E-mail: ivana.martincevic@unin.hr

Vesna SESAR, Ph.D.
University North, Department for Logistics and Sustainable Mobility, Croatia

E-mail: vesna.sesar@unin.hr

Goran KOZINA, Ph.D.
University North

E-mail: goran.kozina@unin.hr

Abstract

The relationship between company age and management's support (perception) to accept new technologies was examined through a questionnaire completed by 136 participants. The data were primarily analyzed using descriptive statistics and the one-way ANOVA test. The primary focus of this research was to determine whether there is a significant difference and connection between a company's age and management's willingness to embrace new technologies. This was tested on export companies in the Republic of Croatia. The results indicate that the mean value of companies aged less than five years and those older than ten years differ significantly from those aged between 5 and 10 years.

Furthermore, there is no significant difference between company size and management's support for accepting new technologies. The findings of this study contribute to a better understanding of management's support (perception) of the adoption and use of new digital technologies in terms of differences in company age, which may influence management's awareness and understanding of the importance of recognizing and implementing new technologies in business and the corporate strategy. Recognizing and implementing new digital technologies in business strategies can influence and strengthen foreign business and make companies more competitive and sustainable in domestic and foreign markets.

Keywords: *export, export companies, companies age, new digital technologies, sustainable business*

JEL Classification: *M1*

1. INTRODUCTION

Changes caused by globalization and internationalization of business create an open space for export-oriented companies, which then creates space for faster growth and development of export companies and ultimately leads to the progress of the entire economy of a country. Export-oriented companies have easier access to new knowledge and technologies and have more stable operations and sustainable development. Doing business on the international market and having international competition under the influence of globalization and internationalization of business creates significant pressure on companies that operate globally. The organization's ability to adapt to market trends and respond to them, especially in digital transformation, and adopting and ultimately using new technologies largely depends on top management and a clear corporate strategy, which must also be directed towards a digital strategy. Recognition, adoption, implementation, and ultimately the use of new digital technologies is a decision of the company's management. This paper aims to investigate and examine whether there is a significant difference between companies' age and management support (perception), representation, adoption, and use of new digital technologies, such as social media (networks), in business strategy. This was tested on export companies in the Republic of Croatia.

2. EXPORT ACTIVITIES OF CROATIAN EXPORT COMPANIES

Expanding business to foreign markets encourages innovation, faster and easier development of the company, as well as the acquisition and expansion of existing and new knowledge. International trade and the international exchange of goods and services are the key factors of economic progress and the development of society as a whole. "Export has always been one of the main strategic directions of successful economies that recognized the importance and urgent need of the internationalization process in the long term" (Nikolić & Miloloža, 2018:175). Foreign trade means the entire exchange of goods and services of a country with another country (Matić, 2004:17). The Republic of Croatia is classified as a „small country" with inherent economic limitations, including limited resources and market size (Jurčić, 2015). In such small economies, a key focus for improving and enhancing competitiveness lies in developing an export-oriented economy, which can significantly impact economic growth and development. This is particularly relevant for the Republic of Croatia, where the emphasis on exporting can be crucial in driving the country's economy forward. In the Republic of Croatia, approximately 15% of companies engage in exporting activities. Despite their relatively small number, these exporting companies play a vital economic role. They employ 51% of the total workforce across all companies, contribute 62% of the total investments, generate approximately 66% of the overall sales revenue, and allocate 73% of the total funds invested in development (Izvozni portal, N/A).

Moreover, these companies achieve a significant profit of 76%. For smaller economies like the Republic of Croatia, the degree of openness is significant since a higher degree of openness leads to increased foreign competition within the domestic market. As a result, there is a continuous influx of innovations and, consequently, pressure on domestic entities to adopt new technologies and create competitiveness (Škuflić & Ladavac, 2001:929). However, the Republic of Croatia's entry into the European Union has further intensified the internationalization of businesses and their competitiveness (Nikolić & Miloloža, 2018). Globalization and internationalization of markets, as well as their opening, are all factors which facilitate the development of innovations and the strengthening of national competitiveness (Škuflić & Ladavac, 2001). According to data from the State Statistical Office for 2022, the Republic of Croatia experienced a 30.4% increase in exports, reaching 23.96 billion euros, and a 46.4% increase

in imports, amounting to 41.57 billion euros. This resulted in a foreign trade deficit of 17.6 billion euros (Croatian Bureau of Statistics, 2023). The export-to-import ratio from January to December 2022, according to results from the Croatian Bureau of Statistics, was 57.6%. Export-competitive companies are more stable in their operations and tend towards sustainable development, highlighting the need for the Republic of Croatia to strengthen its export activities and enhance global competitiveness annually. Sustainability and sustainable business practices enable the creation of long-term values. Sustainability, achieved through management, society, and environmental protection, is the social responsibility of all business entities. Sustainability and sustainable business practices are critical prerequisites for success at both the national and the global level, as exports and export activities contribute to the sustainability of the national economy. To ensure the implementation and documentation of sustainable development, comprehensive corporate reporting should be prioritized, especially in the segment of non-financial reporting. New digital technologies are an integral part of sustainable businesses. They contribute to faster, improved, and higher-quality communication, which is particularly important for export companies and their activities.

3. TOP MANAGEMENT IS THE MAIN FACTOR IN THE RECOGNITION AND IMPLEMENTATION OF NEW DIGITAL TECHNOLOGIES

An indispensable part of business today is the application of new digital technologies. Companies are experiencing a digital transformation, which entails changing their business models and adapting to the market's needs. Thomas et al. (2016) defined digital transformation as "the change that digital technologies can bring to a company's business model, products, processes, and organizational structure". Digitalization and digital transformation of business introduce changes and are the subject of change in an existing society conditioned by technological progress (Chew et al., 2013). New digital technologies accelerate business processes, increase efficiency and effectiveness, and increase profitability. Through digital technologies, companies become recognizable, flexible, and better adaptable to new challenges and market changes. Research by Shen et al. (2020) proved that digital technology adoption and transformation performance are mediated by digital dynamic capability. Creating a digital business

strategy, digital acceleration, and digital mobilization promote and accelerate the digital transformation process in organizations (Hanelt et al., 2021).

Furthermore, exciting research by Balakrishnan and Das (2020) proved that small companies are focused on process innovation, while large and medium-sized companies are focused on process optimization and new offers on the market concerning new technologies. Türk (2023) investigated and confirmed an essential link between time management and productivity while supporting system efficiency and transformation adaptation. Managers need to define a company's digital strategy and, in doing so, influence the change of the existing business. Thus, those with leadership roles must adapt to digital transformation and implement and integrate new digital technologies into their business strategies. Wald et al. (2019) defined digital strategy as effectively rethinking business processes, customer relations, and management practices that provide competitive advantage and value creation. For the quality development of companies under the influence of new technologies, the importance of top management can be emphasized; Shah and Patki (2020) claimed that digital leadership is characterized by using an organization's digital resources to achieve organizational goals and objectives. This research focuses on managers' recognition and importance of new technologies and their integration into the company's corporate strategy. Authors Larjovuori et al. (2016) also claimed that a digital leader is a guide with the ability to formulate a clear and meaningful vision and execute strategies for the digitalization process. In exciting research conducted by Christodoulou et al. (2022), the authors claimed that middle managers play a crucial role in implementing a digital strategy and directly influencing the success or failure of an organization's digital transformation. Similar research investigating top management has confirmed that "top managers respond to the digital transformation by engaging in three key actions: understanding digitalization, setting the formal context for digitalization, and leading change" (Wrede et al., 2020:1549). Türk (2023) investigated digital leadership proposed in the study above and stated that digital leadership "builds the context (time, space) that harmonizes its business and strategy by changing conditions, supports a unifying culture that can integrate financial transformation into it, and has a visionary successful social, and intelligence in directing the emotions of employees, is open to new ideas, nurture creative and design thinking, but maintains its charisma remotely and silently" (Türk, 2023:4). Our research compares top managers and company age from the acceptance and implementation of new

technologies in business strategy and their consequent use, which will be presented in the following chapters.

4. RESEARCH RESULTS

Based on the presented general data and an overview of managers' perception and representation of social media (networks) in business strategy in the previous chapters, we continue by examining the connection between management support (perception) and representation of social media (networks) in business strategy and company age. The digital transformation of business and the adoption of new digital technologies depend highly on top management, i.e., their perception and willingness to implement and use new technologies. The research part of this paper includes a survey conducted in the Republic of Croatia, explicitly targeting export companies. The aim was to investigate whether there is a significant correlation between a company's age and management support (perception) in incorporating social media (networks) into their business strategy, particularly in terms of adoption and utilization.

4.1. Research methodology

A questionnaire was developed based on past research in the field. Table 1 represents the framework used to measure social media (networks) inclusion in business strategies. Our research model for testing the set hypothesis consisted of one independent variable with three categories: COMPANY AGE (1. Less than 5 years, 2. Between 5 and 10 years, and 3. More than 10 years), along with one continuous dependent variable, TM (support/perception of top management). Through this model, we aimed to address additional research questions: Does the perception of management support differ significantly in terms of the integration of social media networks into the business strategies of younger companies (less than 5 years), medium-aged companies (between 5 and 10 years), and older companies (more than 10 years)? Furthermore, is this relationship statistically significant? The importance of new technologies today is indisputable, and it falls upon the company's top management to recognize their importance and implement them into the business and corporate strategy itself as a significant link that drives organizational change in the context of new technology adoption. Since the independent variable consists of more than two

categories and the dependent variable is measured on a continuous scale, we used the one-way analysis of variance (ANOVA) as the appropriate statistical analysis to determine the interaction between these two variables and the statistically significant differences among the means of the three independent groups.

Table 1. Construct of measuring representation of social media (networks) in business strategy (support (perception) of top management)

Item	Source	Questions
TM	TM_vision	Our firm's top/senior management actively articulates a vision for the organizational use of new technology.
	TM_strategy	Our firm's top/senior management actively formulates a strategy for using new technology.

Source: Author's work, according to Bharati et al. (2013)

Managers are responsible for meeting the organization's goals and looking at future steps and predictions for creating a competitive advantage. They are the organizers and creators of the current and future state of the company. Recognizing the advantages of new technologies in today's organizational landscape is crucial for the organization's survival and creating a competitive advantage. The acknowledgment and implementation of these technologies within the organization depend on the actions of top management. They are responsible for defining the digital strategy and possess a vision and plan for the company's development. The support and perception of management regarding the understanding of the significance of new technologies, as well as their implementation and utilization, significantly contribute to the company's ongoing growth and advancement. Kanter (1983) claimed that management support, along with the closely related management perception, is an essential tool when introducing organizational innovations. Zmund (1984), on the other hand, believed that managerial influence when introducing innovations is more pronounced in the context of technical innovations while having relatively less impact on administrative innovations. This paper bases its research on technological innovations and new digital technologies, without which business is unthinkable today. Management support plays a crucial role in recognizing and implementing new technologies in business. New digital technologies not only ensure business sustainability but also enhance market recognition. Integrating these technologies into business practices and their inclusion in the corporate strategy is essential for achieving sustainability, reflected in corporate reporting, particularly non-

financial reporting. Companies operating in the digital age should make them aware that information is available 24/7 – it is precisely because of this that they must not ignore the importance of digital technologies and their integration into business and corporate strategy. By defining their purpose regarding social impact, companies can attain sustainability and success while embracing new market trends and digital technologies. The positive effects of adopting and utilizing new digital technologies are evident in improved efficiency, productivity, quality, and sustainable business practices, all of which contribute to sustainable reporting to the public, including non-financial reporting. The community and all other parties are invested and interested in companies contributing to economic growth and development. Sustainability reporting, including non-financial reporting, informs the public about the shift towards sustainable development, with new digital technologies playing a crucial role. Top management is key in integrating digital technologies into the corporate strategy and promoting their implementation and utilization.

4.2. Sample characteristics

Our sample of 136 companies consists of various company sizes. Specifically, 35% are micro companies, 24% are small-sized companies, 20% are middle-sized companies, and 21% are big companies (Figure 1). Furthermore, 80% of the sample comprises companies older than 10, 14% are between 5 and 10, and 6% are less than 5.

Figure 1. Company size

Source: Author's work

Figure 2 shows that 50.7% of the companies have an annual income of less than 3 million euros, while 28.7% have more than 3 million euros and less than

20 million euros. Additionally, 20.6% of the companies have an annual income exceeding 20 million euros.

Figure 2. Total annual income

■ > 3 MIL EURO ■ < 3 AND >20 MIL EUROS ■ > 20 MIL EUROS

Source: Author's work

As observed in Figure 3, the distribution across industries is as follows: 31% of the sample companies are in the manufacturing industry (C), 10% engage in other service activity (S), and an equal percentage of companies (10%) are in wholesale and retail trade (G), information and communication activity and professional, scientific and technical sciences (M). The remaining 29% of companies are in other categories.

Figure 3. Business activity according to the NKD classification
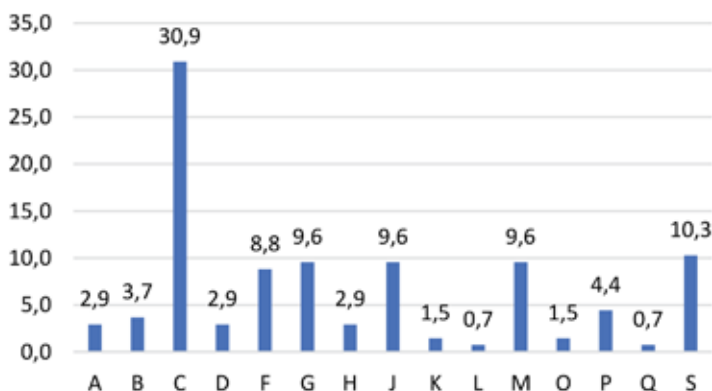
Source: Author's work

4.3. Testing hypothesis

Since no research has been conducted in the Republic of Croatia that correlates company age and top managers' support (perception) regarding social media (networks) representation in business strategy in the context of new technology adoption, the above research was conducted. The research was conducted within the territory of the Republic of Croatia using a randomly selected sample that includes 136 export companies (micro, small, medium, and large).

The research aims to test hypothesis H1, which examines whether there is a statistically significant difference between company age and management's support (perception) regarding social media (networks) representation in the business strategy. The study utilizes one independent variable, "company age," categorized as less than 5 years, between 5 and 10 years, and more than 10 years. The dependent variable, on the other hand, is "support (perception) of top management," measured through two variables, TM_vision and TM_strategy. To analyze the hypothesis, a one-way ANOVA was conducted to assess the impact of company age (independent variable) on the support (perception) of top managers (dependent variable), with TM_vision and TM_strategy as its constituent variables. Mean values were calculated for each variable, and the ANOVA test was performed (Table 2).

Table 2. Data about each group of company (number of companies, mean value, standard deviation, confidence level, and min and max)

Dependent variable	Company age	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
						Lower Bound	Upper Bound		
TM_vision	Less than 5	8	4.5000	0.75593	0.26726	3,8680	5.1320	3.00	5.00
	Between 5 and 10	19	3.5263	1.30675	0.29979	2.8965	4.1562	1.00	5.00
	More than 10	109	3.4495	1.24340	0.11910	3.2135	3.6856	1.00	5.00
	Total	136	3.5221	1.24702	0.10693	3.3106	3.7335	1.00	5.00
TM_strategy	Less than 5	8	4.2500	0.70711	0.25000	3.6588	4.8412	3.00	5.00
	Between 5 and 10	19	3.4211	1.21636	0.27905	2.8348	4.0073	1.00	5.00
	More than 10	109	3.1009	1.26158	0.12084	2.8614	3.3404	1.00	5.00
	Total	136	3.2132	1.25555	0.10766	3.0003	3.4262	1.00	5.00

Source: Author's work

According to the test results, the variances were equal for each variable. Therefore we can say that the homogeneity of variance is not broken (TM_vision, $F_{(2, 133)} = 1.54$. $p > 0.05$, TM_strategy ($F_{(2, 133)} = 1.59$. $p > 0.05$ (table 3).

Table 3. Test of Homogeneity of Variance

Item	Levene Statistic	df1	df2	Sig.
TM_vision	1.547	2	133	0.217
TM_strategy	1.597	2	133	0.206

Source: Author's work

From the ANOVA table (Table 4), it is evident that the significance value is 0.031 for the TM_strategy variable ($p < 0.05$), indicating a statistically significant difference in the mean support (perception) of managers regarding the representation of social media (networks) in business strategy among companies of different ages. Top management's support (perception) regarding the company's vision is not statistically significant among companies of different ages (sig=0.070).

Table 4. ANOVA results

Item		Sum of Squares	df	Mean Square	F	Sig.
TM_vision	Between Groups	8.225	2	4.112	2.711	0.070
	Within Groups	201.709	133	1.517		
	Total	209.934	135			
TM_strategy	Between Groups	10.795	2	5.397	3.553	0.031
	Within Groups	202.021	133	1.519		
	Total	212.816	135			

Source: Author's work

Table 5 presents Tukey's HSD test for multiple comparisons. The analysis result indicated that only one dependent variable (TM_strategy) has a statistically significant difference regarding the company age group. No statistically significant differences were observed among any company age group in the dependent variable TM_vision.

The analysis revealed a significant difference in the mean value of the dependent variable TM_strategy between the group of companies with less than 5 years of age and the group with more than 10 years of age (p =0.032, 95% C.I.

= 0.0790, 2.2191). However, no statistically significant differences were observed between the 5 to 10 years of age and the less than 5 group (p = 0.251) or between the group of 5 to 10 years of age and the more than 10 years group (p = 0.550).

Table 5. Multiple comparisons table

Tukey HSD						95% Confidence Interval	
Dependent variable	Company age (I)	Company age (J)	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
TM_vision	Less than 5	Between 5 and 10	0.97368	0.51904	0.150	-0.2566	2.2039
		More then 10	1.05046	0.45110	0.055	-0.0188	2.1197
	Between 5 and 10	Less than 5	-0.97368	0.51904	0.150	-2.2039	0.2566
		More than 10	0.07677	0.30616	0.966	-0.6489	0.8025
	More than 10	Less than 5	-1.05046	0.45110	0.055	-2.1197	0.0188
		Between 5 and 10	-0.07677	0.30616	0.966	-0.8025	.6489
TM_ strategy	Less than 5	Between 5 and 10	0.82895	0.51944	0.251	-0.4022	2.0601
		More then 10	1.14908*	0.45145	0.032	0.0790	2.2191
	Between 5 and 10	Less than 5	-.82895	0.51944	0.251	-2.0601	.4022
		More than 10	0.32014	0.30640	0.550	-0.4061	1.0464
	More than 10	Less than 5	-1.14908*	0.45145	0.032	-2.2191	-0.0790
		Between 5 and 10	-0.32014	0.30640	0.550	-1.0464	0.4061

*The mean difference is significant at the 0.05 level
Source: Author's work

The analysis also included the examination of company sizes (micro, small, medium, and large), and the results are as follows. The variances were found to be equal for each variable, and the homogeneity of variance was not broken when analyzing company size (TM_vision, $F(3, 132) = 0.68$, $p > 0.05$; TM_strategy, $F(3, 132) = 0.319$, $p > 0.05$). Furthermore, the ANOVA results indicate no statistically significant difference between the mean perception of managers regarding the representation of social media (networks) in business strategy and company vision among different size groups.

5. DISCUSSION AND RECOMMENDATIONS FOR FURTHER RESEARCH

After conducting research and presenting results related to the connection between top management support and company age regarding the representa-

tion of social media (networks) in the business strategy, we can highlight the limitations of this research and make recommendations for further research. Given the purpose and goal of the research, the number of elements within the observed constructs for further research can and should be increased but also changed. The research sample consisted of export companies (companies of different sizes and ages) in the Republic of Croatia. To examine if there is a connection in the mean perception of top managers regarding the representation of social media (networks) in the business strategy among companies of different ages, we analyzed it from the perspective of company age as a factor influencing top management in the context of new technology adoption and integration into the business strategy. To prove the set goals, the following research hypothesis H1 was tested: *Is there a statistically significant difference between the company age and the support (perception) of the management regarding the representation of social media (networks) in the business strategy?* The obtained results confirmed the set research hypotheses. The research showed that the independent variable, *"company age,"* has a statistically significant impact on the dependent variable, *"support (perception) of top management"*.

The results indicate that the dependent variable (TM_strategy) had a statistically significant difference regarding the company age group (independent variable). The dependent variable (TM_vision) has no statistically significant difference between company age groups. The mean value of the dependent variable TM_strategy significantly differed between the less than 5 years group and the more than 10 years group of companies. Also, there was no statistically significant difference between a group of 5 to 10 years of age and less than 5 years. Additionally, there is no significant difference regarding the company's size and management's support to accept and implement new digital technology in the business strategy. For a better understanding of the research, it is necessary to point out the recommendations for further research. This type of research is the first survey in the Republic of Croatia that examines the connection and relationship between the company age and top management support (perception) and willingness to accept and implement new digital technologies in the business strategy. This research includes two constructs that measure the representation of social media (networks) in the business strategy; these constructs are related to "a vision for the organizational use of new technology" and "a strategy for the organizational use of new technology". For future research, it would be appropriate to include other elements (apart from vision and strategy) essential

at the top management and organization management level. Also, it would be desirable to investigate other levels of management, low and middle, and their potential influence on digital strategy, i.e., the inclusion of digital technologies in the company's corporate strategy. This research was conducted in the territory of the Republic of Croatia, so for future research, it is recommended to expand the scope beyond the Republic of Croatia and include other EU countries and neighboring countries, which would allow domestic companies of the Republic of Croatia to compare data according to specific criteria and areas.

Additionally, it would be beneficial to investigate the same research parameters in domestic companies to compare with export companies. This paper highlights the importance of new digital technologies in the context of top managers' recognition and integration into the company's business strategy, considering the correlation with the company's age. Furthermore, it also defines some critical determinants of technology adoption and application in business strategy. It emphasizes new digital technologies as an indispensable factor in today's modern business, both in the domestic and foreign markets.

6. CONCLUSION

This study was designed to explore company age as a factor influencing top management in adopting and integrating new digital technology in business strategy. The survey included 136 export companies from the Republic of Croatia, making it the first research in the country to explore the connection and relationship between company age and top management's perception and willingness to accept and implement new digital technologies in business strategy. This significant scientific contribution breaks new ground for further research in this area. It is essential to study managers' support and perception of the acceptance of new technologies and place it in the context of the company age, as younger companies are generally more willing to accept and adapt to new technologies quickly. In comparison, older companies accept new technologies as part of a market survival strategy, resulting in a much slower process. Even though most research in the field has shown that older companies are not as open to changes as younger ones, our research indicates that both older and younger management are aware of the significance of actively formulating strategies for the organizational use of new technologies.

Moreover, there seems to be no statistically significant difference in management perception regarding articulating a vision for using new technology concerning company age. Several recommendations for further research have been stated in Section 5. The impact of this research lies in raising awareness among the public, the academic community, as well as managers of exporting companies and non-exporting companies regarding the importance of and correlation between company age and top managers regarding top management's support (perception) and willingness for inclusion of digital technologies in the company's corporate strategy. Considering the empirical results, it is possible to conclude that company age (but not all company age groups) is an essential factor influencing and pressuring top management to recognize and implement new digital technology in business strategy. In conclusion, there are many opportunities for future investigation and methodological approaches in various areas related to this research. By analyzing the relevant scientific literature and the findings of this research, it is possible to conclude that there is a connection and relationship between a company's age and top management's support (perception) and willingness to accept and implement new digital technologies in their business strategy.

Regardless of their size, companies should be prepared to adapt to market changes, as this impacts the creation of long-term values in ecological, social, and economic development. Companies and top management acknowledge and accept the importance of new digital technologies as fundamental to new business approaches, striving for sustainability and integrating new digital technologies within a sustainable business strategy. Finally, this paper presents directions that should continue to be regularly examined and tested as new digital technologies emerge.

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BIBLIOMETRIC ANALYSIS OF PAPERS APPLYING THE AHP METHOD IN BUSINESS ECONOMICS

Martina BRIŠ ALIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: martina.bris.alic@efos.hr

Abstract

This study aims to provide a general overview of the scientific papers that apply the Analytic Hierarchy Process - AHP method in business economics. The papers in the Web of Science Core Collection database were included in the analysis. Forty-four papers matched the search query, with the first paper being from 2009. A bibliometric analysis was performed to review the scientific papers. First, a descriptive overview of the papers was provided. Then the papers were analyzed using the following bibliometric analysis: Co-authorship analysis (Unit of analysis: Authors and Countries), Co-occurrence analysis (Unit of analysis: All keywords), Citation analysis (Unit of analysis: Documents, Sources and Authors), Co-citation analysis (Unit of analysis: Cited references, Cited sources and Cited Authors). To perform the analysis, 44 articles were downloaded from the WoS database, saved as plain text files (.txt file), and uploaded to the Visualization of Similarities - VoSviewer software program, where the analysis was performed. The paper contributes to understanding the literature on applying the AHP method in business economics by showing the main ideas from previous studies, the geographical distribution of publications, and important scientific papers, authors, and journals in the field.

Keywords: *Analytic Hierarchy Process – AHP, business economics, bibliometric analysis*

JEL Classification: *C61*

1. INTRODUCTION

Multicriteria decision-making (MCDM) methods are an analytical tool that enables efficient decisions when various considerations are incorporated into the process. These methods are generally categorized as Multi-Objective Decision Making (MODM) and Multi-Attribute Decision Making (MADM) (Guler & Yomralioglu, 2020)

The Analytic Hierarchy Process (AHP) is one of the most popular MCDM methods that focuses on organizing and analyzing complex decisions; it provides a logical framework for a particular decision by quantifying the alternative options and criteria (Krouska, 2022). Analytic Hierarchy Process - AHP is a method that helps deal with complicated problems. Saaty developed it in the 1970s and has evolved significantly over the years. AHP uses the criteria that are essential to the decision-making process. It forms a hierarchical structure by providing uninterrupted steps. The ranking of criteria and sub-criteria is determined starting with the overall goal, and then the alternatives are identified. The decision-makers decide how important one criterion is compared to another by creating pairwise comparison matrices. The AHP also calculates the inconsistencies in the decision makers' judgments - the consistency ratio (CR). If the CR is less than 0.1, the pairwise comparisons are accepted (Guler & Yomralioglu, 2020).

AHP is a structured multi-attribute decision-making method and has several advantages over other multicriteria decision-making methods: (1) facilitates complex decision-making involving multiple criteria hierarchically linked in clusters; (2) allows not only selection but also relative prioritization and evaluation of alternatives based on the criteria used for decision making; (3) can transform complex relationships between both qualitative and quantitative criteria used for decision making into measurable quantitative relationships; (4) AHP provides more straightforward operation than other MCDM methods (Abadi & Moore, 2022).

The paper is divided into five sections. The literature review section presents several examples of applying the AHP method in business economics. The examples of AHP method application were taken from the papers used in the bibliometric analysis as the central part of this paper. Sections 3 and 4 describe the method of bibliometric analysis and provide a review of papers applying the AHP method in business economics that have been published in various sources of the Web of Science database. A review based on specific bibliometric indicators was conducted. A descriptive review of the papers included in the retrieved sources was

conducted. An analysis was performed using the following bibliometric analysis: Co-authorship analysis (Unit of analysis: Authors and Countries), Co-occurrence analysis (Unit of analysis: All keywords), Citation analysis (Unit of analysis: Documents, Sources and Authors), Co-citation analysis (Unit of analysis: Cited references, Cited sources and Cited Authors). This analysis was used to identify the most important studies, journals, authors, keywords and their links and relationship networks. In addition, a graphical bibliometric overview was created using the Visualization of Similarities - VoS viewer program. Finally, Section 5 presents the main findings, conclusions, and recommendations for further research.

2. LITERATURE REVIEW

Du et al. (2022) used the Analytic Hierarchy Process (AHP) method to measure the corporate governance capability of mixed-ownership reform enterprises for listed companies in Zhejiang, China, in 2020 using the three dimensions of the listed sector, regional distribution, and industry category. The measurement system included 16 second-level and 53 third-level indicators, formed from the four aspects of resource integration capability, organizational transformation capability, relationship coordination capability, and internal and external monitoring capability. The results showed that the corporate governance capability of reform enterprises with mixed ownership is better in small and medium-sized enterprises than in large enterprises, and most industries in the Zhejiang Province of China have sound corporate governance systems. In contrast, only a few industries have deficiencies.

Wu et al. (2013) used a two-stage model to evaluate the subjective management and performance of 15 Chinese airlines using data from 2008 and 2009. Wu et al. used the Analytic Hierarchy Process (AHP) and Factor Analysis (FA) models in the first stage. In the second stage, two types of comprehensive valuation indexes from 2008 were used as the reference index set, and two comprehensive valuation indexes from 2009 were used as the current index set. The four data sets were calculated using the group decision model based on Data Envelopment Analysis (DEA) with Restraint Cone. The results of Wu et al. are presented in three main aspects: (1) the research enriched the theory of airline competitiveness, (2) a more scientific and comprehensive evaluation index system for airline competitiveness evaluation was developed by the research, (3) a model for competitiveness evaluation based on binary relative evaluation (BRE) was established. The results are consistent with the real conditions in the airline market.

Lazarević et al. (2020) proposed the A'BA model, which consists of two parts - the Analytic Hierarchy Process (AHP) method and the business unit theory - to provide guidelines for improving business performance in the case of a distribution system, namely a postal company. Saaty's scale in the plane (SSP) is a new concept for aggregating expert assessments. The concept consists of four steps: (1) two axes: vertical axis 1 - Saaty scale and horizontal axis 2 - experts, (2) grouping the ratings, (3) mapping the ratings in the plane, and (4) determining the final score of the comparison. The advantages of the new concept of SSP are reflected in the visualization of the comparison results, while the limitation is that the analyst should know computer-aided visualization techniques.

Yang et al. (2020) proposed an AHP-based model to evaluate and combine the critical criteria in assessing the credit quality of Internet companies. According to the General Administration of Quality Supervision, Inspection and Quarantine (GAQSIQ) of the People's Republic of China, quality credit is defined as "the ability of an enterprise and the extent to which it (1) complies with quality laws and regulations, (2) implements standards, and (3) meets quality commitments in production and operation" From the survey results, B31 product supervision qualification rate (0.1012), B21 legitimacy of operation (0.0838) and B15 quality accidents (0.0821) are the three most essential items in this quality evaluation system, and these three items are the "lower end" of product quality or enterprise quality.

Popescu and Gasparotti (2022) proposed SWOT-AHP, a hybrid methodology for formulating and selecting strategies for planning to increase the performance of the Romanian naval sector. The methodology consisted of three steps: (1) SWOT analysis of this sector based on information collected from experts in the field, (2) TOWS matrix used to define the strategies to be implemented through logical combinations between the SWOT factors, and (3) AHP to determine the relative importance of the SWOT factors and subfactors and the overall priorities of the strategies formulated by experts in the field. The results show that the proposed approach has the advantages of the hybrid method SWOT-AHP to select the most effective strategies to increase the performance of the Romanian naval sector while being a relatively simple and appropriate tool for this type of strategic problem.

Ghasemzadeh et al. (2017) identified and prioritized the strategies related to disruption management in the petroleum supply chain. The research was conducted by interviewing 32 senior and middle-level managers in different parts

of the studied supply chain and using T-tests to identify the most important criteria. A combination of Choquet integral operator and AHP determined the prioritization of strategies. The studied supply chain is a real supply chain in Iran that obtains part of the required materials from abroad through sea and road transportation. The results show that the most crucial strategy from each supply, production, and distribution perspective does not necessarily coincide with the most critical strategy in the entire supply chain.

3. DATA DESCRIPTION AND METHODOLOGY

Scientific papers on the area under study are searched in the Web of Science Core Collection database. Some reasons for using the WoS database are (Briš Alić et al., 2022): (i) WoS includes numerous journals in the social sciences. In this regard, it contains sufficient data for bibliometric analysis, (ii) it is easily accessible due to the membership of universities, and (iii) datasets for software can be obtained in a suitable file type. These advantages greatly facilitate obtaining the dataset, transferring it to the program, and performing the analysis. However, most WoS journals have a high impact factor and the potential to be leaders in their field. Once it was decided that the WoS database should be used as a source of papers, keywords were selected to find relevant papers. The following query was created/used: ("Analytical Hierarchy Process" or AHP) and "Business Economics," resulting in 44 papers. The papers were published in the following areas: economics, management, artificial intelligence and machine learning, transportation, safety and maintenance, supply chain and logistics, economic theory, hospitality, leisure, sports and tourism, modeling and simulation. To perform the analysis, 44 articles were downloaded from the WoS database, saved as a plain text file (.txt file), and uploaded to the Visualisation of Similarities - VoSviewer software program, where the analysis was performed.

The bibliometric analysis was used to evaluate and graphically display the search results from the WoS database. First, a descriptive overview of the papers was provided. Then the papers were analyzed using the following bibliometric analysis: Co-authorship analysis (Unit of analysis: Authors and Countries), Co-occurrence analysis (Unit of analysis: All keywords), Citation analysis (Unit of analysis: Documents, Sources and Authors), Co-citation analysis (Unit of analysis: Cited references, Cited sources and Cited Authors). The bibliographic data were chosen to create a map of co-authorship, co-occurrence of keywords, cita-

tions, and co-citations. The data source was the Web of Science bibliographic database files, previously downloaded and saved as plain text (.txt).

The search was not limited in time, and as seen from Figure 1, the oldest relevant paper dates from 2009. Figure 1 also shows that the papers corresponding to the keywords in the search query were regularly published until 2023 (including 2023 until April 20). Most relevant papers were published in 2012 (8), followed by 2013 (6), while five were published in 2014 and 2020.

Figure 1. Number of published papers by year
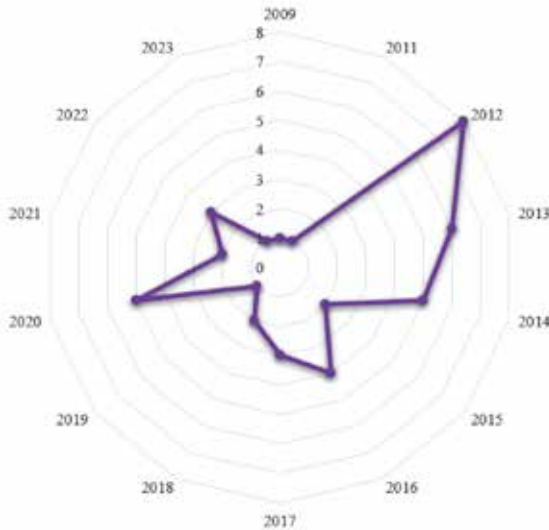
4. EMPIRICAL RESEARCH AND RESULTS

4.1. Co-authorship analysis

4.1.1. Unit of analysis: Authors

One hundred seventeen authors wrote the papers included in the analysis. Table 1 shows that Zavadskas, Edmundas Kazimieras is the most productive author - 7 papers included in the analysis are by him. Interestingly, Sadeghi, Arash and, Aghdaie, Mohammad Hasan authored four articles in the analysis. Table 1 also lists the authors who have published two articles that are the subject of the study.

Table 1. The most productive authors

Author	Documents
Zavadskas, Edmundas Kazimieras	7
Sadeghi, Arash	4
Aghdaie, Mohammad Hasan	4
Fouladgar, Mohammad Majid	2
Yazdani-Chamzini, Abdolreza	2
Hashemkhani Zolfani, Sarfaraz	2
Jusoh, Ahmad	2
Nor, Khalil Md	2
Esmaeili, Ahmad	2
Rostamzadeh, Reza	2
Turskis, Zenonas	2
Azar, Adel	2
Zheng, Xiaosong	2
Cavallaro, Fausto	2
Pamucar, Dragan	2
Varzandeh, Mohammad Hossein Morshed	2

Source: Author, 2023

Of the 117 authors included in the analysis, 33 relate to each other. The remaining authors are not connected with any other authors. The collaborating authors are shown in Figure 2. Zavadskas, Edmundas Kazimieras, is the most prolific collaborator, who relates to 22 other authors. He is followed by Aghdaie, Mohammad Hasan, who is connected to 14 authors, while Cavallaro, Fausto; Pamucar, Dragan; Varzandeh, Mohammad Hossein Morshed and Zolfani, Sarfaraz Hashemkhani share the third place with ten connections each.

Figure 2. Connections between authors
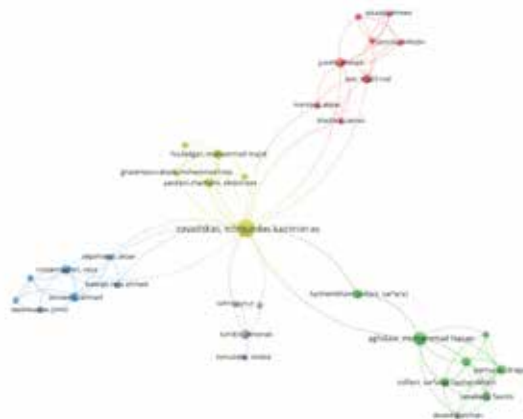
Source: Author, 2023

4.1.2. Unit of analysis: Countries

Table 2 shows the most productive countries in the studied field, measured by the number of published papers and citations. The authors of the analyzed papers are from 21 countries. The most productive country is Iran, with 15 published papers, followed by Lithuania, with 14 published papers. In terms of number of citations, Lithuania ranks first with 536 citations, while Iran ranks second with 361 citations. Interestingly, China ranks third in the number of published papers but ninth in the number of citations (with only 13). The United States ranks fourth in the number of papers published (5 papers published) but fifth in the number of citations (29 citations). Three of the 21 countries included in the analysis are not connected to other countries. These are Indonesia, Romania and Taiwan.

Table 2. The most productive countries

Rank	Country	Papers	Citations	Rank	Country	Papers	Citations
1	Iran	15	361	12	Montenegro	2	2
2	Lithuania	14	536	13	Taiwan	2	29
3	Republic China	9	13	14	England	1	3
4	USA	5	29	15	France	1	0
5	Turkey	4	83	16	Germany	1	2
6	Italy	3	18	17	India	1	0
7	Malaysia	3	73	18	Indonesia	1	1
8	Serbia	3	11	19	Portugal	1	18
9	Canada	2	1	20	Romania	1	1
10	Chile	2	1	21	United Arab Emirates	1	0
11	Czech Republic	2	10				

Source: Author, 2023

4.2. Co-occurrence analysis

4.2.1. Unit of analysis: All keywords

A Co-occurrence analysis, Unit of analysis: All keywords was performed to investigate the relationships between the keywords in the analyzed papers. The analysis resulted in 318 keywords, of which 298 are repeated 2 or more times in

the studied articles, while the remaining 20 appear only once as keywords. The keywords in the studied papers are shown in Figure 3.
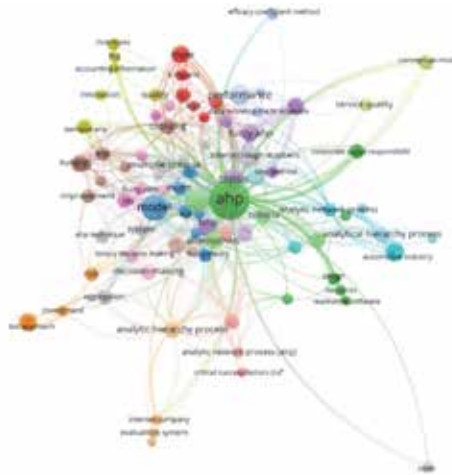
Source: Author, 2023

As shown in Figure 3, which shows related keywords in the analyzed papers, the most frequently used keywords are AHP (26 repetitions), model (11 repetitions), selection (8 repetitions), performance (7 repetitions), topsis (6 repetitions), and the words alternatives, decision making, fuzzy AHP, management, and multiple criteria with five repetitions each. Other words occur less than five times. The keyword AHP has the highest links with other keywords found in the studied papers. The total link strength of the keyword AHP is 275. The Total link strength attribute indicates the total strength of a given keyword with another keyword (Van Eck & Waltman, 2021). This is followed by the keywords model (total link strength is 141), selection (total link strength is 105), topsis (total link strength is 74), and alternatives (total link strength is 70).

As shown from the color scheme in Figure 3, the keyword AHP is highlighted in green; it also occurs in other researched papers with other words highlighted in green, such as decision, design, corporate social responsibility (CSR), and teamwork software.

It is interesting to look at the most frequently occurring keywords. Figure 4 shows the keywords that occur at least five times.

Figure 4. Keywords that appear at least five times
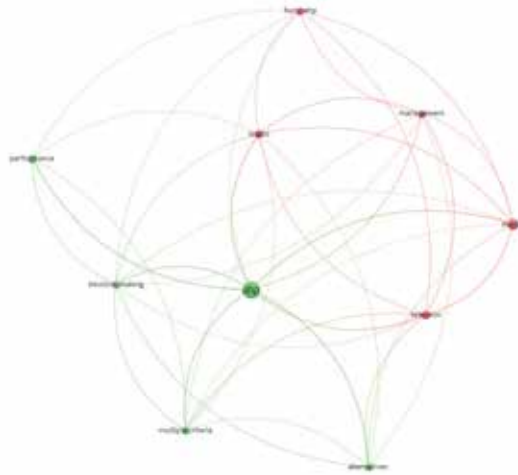
Table 3 gives an overview of the keywords that occur at least five times. Table 3 also contains the number of occurrences and the total link strength of the different versions of the mentioned keywords.

As can be seen, in addition to the keyword AHP, the following keyword variants were used: AHP technique (1 occurrence, total link strength 10), analytic hierarchy (1 occurrence, total link strength 10), analytic hierarchy process (4 occurrences, total link strength 46), analytic hierarchy process (AHP) (1 occurrence, total link strength 4), analytical hierarchical process (1 occurrence, total link strength 4), and analytical hierarchy process (4 occurrences, total link strength 37). The keyword Analytic Hierarchy Process - AHP occurs 38 times in the analyzed papers, and its total link strength is 386. As for the keyword fuzzy AHP, it can be noted that the following keyword variants were used in the analyzed papers: fahp (3 occurrences, total link strength 39), fuzzy analytic hierarchy process (1 occurrence, total link strength 5), fuzzy analytic hierarchy process (AHP) (1 occurrence, total link strength 7). Table 3 lists the keyword fuzzy (1 occurrence, total link strength 13). The keyword fuzzy analytic hierarchy process occurs 11 times in the studied papers, and its total link strength is 129. Such analysis can be performed for all other keywords as well.

Table 3. Overview of keywords that appear at least five times

Keyword			Keyword		
Analytic Hierarchy Process - AHP	**38**	**386**	**Performance**	**15**	**160**
ahp	26	275	360-degree performance appraisal	1	8
ahp technique	1	10	business performance	1	13
analytic hierarchy	1	10	evaluate financial performance	1	16
analytic hierarchy process	4	46	financial performance evaluation	1	16
analytic hierarchy process (ahp)	1	4	new performance measures	1	15
analytical hierarchical process	1	4	**performance**	**7**	**89**
analytical hierarchy process	4	37	performance measurement	2	29
			project performance evaluation	1	4
Fuzzy Analytic Hierarchy Process	**11**	**129**			
fahp	3	39	**Topsis**	**9**	**99**
fuzzy	1	13	fuzzy topsis	1	4
fuzzy ahp	**5**	**65**	interval topsis	1	6
fuzzy analytic hierarchy process	1	5	**topsis**	**6**	**74**
fuzzy analytic hierarchy process (ahp)	1	7	topsis method	1	15
Fuzzy	**11**	**135**	**Alternatives**	**5**	**70**
fuzzy analytic network process	*1*	*15*			
fuzzy copras	*1*	*15*	**Decision making**	**24**	**291**
fuzzy delphi method	*1*	*5*	binary decision making	1	9
fuzzy dematel	*1*	*13*	criteria decision-making	1	16
fuzzy expert system (fes)	*1*	*9*	decision	2	13
fuzzy logic	*1*	*11*	**decision making**	**5**	**58**
fuzzy mixed integer goal programming	*1*	*15*	**decision-making**	**4**	**49**
fuzzy sets	*2*	*24*	decisions	1	15
fuzzy theory	*1*	*13*	fuzzy multi-criteria decision making (madm) methods	1	4
intuitionistic fuzzy	*1*	*15*	group decision making (gdm)	1	9
			multi-criteria decision making	1	16
Model	**20**	**252**	multiattribute decision-making	1	15
conceptual-model	1	11	multicriteria decision-making	3	44
decision-making model	1	14	multiple attribute decision making (madm)	2	28
evaluation model	1	15	multiple-criteria decision making	1	15
fuzzy-dematel model	1	12			
goal programming-model	1	15	**Management**	**12**	**149**
hybrid mcdm model	1	15	disruption management strategies	1	15
mathematical model	1	8	distribution channel management	1	16
mcdm model	1	16	earnings management	1	8
model	**11**	**141**	**management**	**5**	**67**
multi criteria model	1	5	management implementation	1	13
			supply chain management	2	22
Selection	**20**	**268**	supply chain management (scm)	1	8
it portfolio selection	1	5			
machine-tool selection	1	15			
market segment evaluation and selection	1	16	**Criteria**	**13**	**163**
market segment selection	1	14	combining criteria	1	9
partner selection	1	14	criteria	4	54
personnel selection	1	14	fuzzy multiple criteria	1	16
personnel-selection	1	14	multicriteria evaluation methods	1	10
project evaluation and selection	2	28	**multiple criteria**	**5**	**60**
project portfolio selection	1	13	multiple criteria assessment	1	14
selection	**8**	**105**			
supplier selection	1	15			
vendor selection	1	15			

Source: Author, 2023

4.3. CITATION ANALYSIS

Citation analysis identifies the most frequently cited studies, authors, and journals in a research area. It provides information about the relative influence of studies, authors, and journals in a given field and helps determine their importance (Ozturk, 2021).

4.3.1. Unit of analysis: Documents

A citation analysis (Unit of analysis: Documents) was performed to identify the most frequently cited papers. Table 4 shows the most frequently cited studies measured by Web of Science citations. The Journal of Business Economics and Management published the five most cited articles. Podvezko (2009) is the most cited study, with 130 citations. The article by Yazdani-Chamzini et al. (2013) was the second most cited (106), and the article by Mardani et al. (2015) reached 73 citations, ranking third among the articles included in the analysis in terms of number of citations. Data on the other most cited papers can be found in the same table.

Table 4. Citation analysis at the publication level

Cited documents	Citations	Total link strength
Podvezko, V. (2009). Application of AHP Technique. *Journal of Business Economics and Management*, 10(2), p. 181–189. https://doi.org/10.3846/1611-1699.2009.10.181-189	130	2
Yazdani-Chamzini, A., Fouladgar, M. M., Zavadskas, E. K., & Moini, S. H. H. (2013). Selecting the Optimal Renewable Energy Using Multi Criteria Decision Making. *Journal of Business Economics and Management*, 14(5), p. 957–978. https://doi.org/10.3846/16111699.2013.766257	106	2
Mardani, A., Jusoh, A., Zavadskas, E. K., Khalifah, Z., & Nor, K. M. (2015). Application of Multiple-Criteria Decision-Making Techniques and Approaches to Evaluating of Service Quality: A Systematic Review of the Literature. *Journal of Business Economics and Management*, 16(5), p. 1034–1068. https://doi.org/10.3846/16111699.2015.1095233	73	1
Aghdaie, M. H., Hashemkhani Zolfani, S., & Zavadskas, E. K. (2013). Market Segment Evaluation and Selection Based on Application of Fuzzy AHP and Copras-G Methods. *Journal of Business Economics and Management*, 14(1), p. 213–233. https://doi.org/10.3846/16111699.2012.721392	63	3
Turanoglu Bekar, E., Cakmakci, M., & Kahraman, C. (2016). Fuzzy Copras Method for Performance Measurement in Total Productive Maintenance: A Comparative Analysis. *Journal of Business Economics and Management*, 17(5), p. 663-684.	62	2
Sadeghi, A., Larimian, T., & Molabashi, A. (2012). Evaluation of Renewable Energy Sources for Generating Electricity in Province of Yazd: A Fuzzy Mcdm Approach. *Procedia-Social and Behavioral Sciences, World Conference on Business, Economics and Management* (BEM-2012), 62, p. 1095-1099	42	0
Rostamzadeh, R., Esmaeili, A., Nia, A. S., Saparauskas, J. & Keshavarz Ghorabaee, M. (2017). A Fuzzy Aras Method for Supply Chain Management Performance Measurement in SMEs under Uncertainty. *Transformations in Business & Economics*, 16(2A), p. 319–348.	37	2
Kersuliene, V., & Turskis, Z. (2014). A Hybrid Linguistic Fuzzy Multiple Criteria Group Selection of a Chief Accounting Officer. *Journal of Business Economics and Management*, 15(2), p. 232–252. https://doi.org/10.3846/16111699.2014.903201	25	1

Hsu, L. C. (2013). Investment Decision Making Using a Combined Factor Analysis and Entropy-Based Topsis Model. *Journal of Business Economics and Management*, 14(3), p. 448–466. https://doi.org/10.3846/16111699.2011.633098	25	0
Streimikiene, D., & Balezentiene, L. (2012). Assessment of Electricity Generation Technologies Based on Ghg Emission Reduction Potential and Costs. *Transformations in Business & Economics*, 11(2A), p. 333–343.	23	1
Fouladgar, M. M., Yazdani-Chamzini, A., Zavadskas, E. K., Yakhchali, S. H., & Ghasempourabadi, M. H. (2012). Project Portfolio Selection Using Fuzzy AHP and Vikor Techniques. Transformations in Business & Economics, 11(1), p. 213–231.	22	3

Source: Author, 2023

4.3.2. Unit of analysis: Sources

As shown in Table 5, the most significant number of articles were published in the Journal of Business Economics and Management (impact factor: 2.596) – 16 articles. Articles published in this journal were cited the most (555). The journal Transformations in Business & Economics (impact factor: 1.842) is second in terms of both the number of articles (14 articles) and the number of citations (118 citations). Another notable source is the Conference on Business, Economics and Management, whose proceedings (2012, 2013, 2014, and 2018) published nine papers cited 108 times.

Table 5. List of journals (with their impact factor) and conferences, number of published papers and citations

Journal/Conference	Impact (2022-2023) (Accelerator, 2023)	Papers	Citations
Journal			
EUROPEAN JOURNAL OF OPERATIONAL RESEARCH	6.363	1	4
FRESENIUS ENVIRONMENTAL BULLETIN	0.618	1	0
JOURNAL OF BUSINESS ECONOMICS AND MANAGEMENT	2.596	16	555
SMALL BUSINESS ECONOMICS	7.096	1	0
TRANSFORMATIONS IN BUSINESS & ECONOMICS	1.842	14	118
Conference			
INTERNATIONAL CONFERENCE ON BUSINESS, ECONOMICS, FINANCIAL SCIENCES AND MANAGEMENT (BEFM 2011)		1	4
CONFERENCE ON BUSINESS, ECONOMICS AND MANAGEMENT		9	108
World Conference on Business, Economics and Management (BEM 2012)		5	90

2nd World Conference on Business, Economics and Management (BEM 2013)	1	17
International Conference on Business, Economics and Management (BEM 2014, VOL.1)	1	0
International Conference on Business, Economics and Management (BEM 2014, VOL. 2)	1	0
7th World Conference on Business, Economics and Management (BEM 2018)	1	1

Source: Author, 2023

4.3.3. Unit of analysis: Authors

Table 6 shows that Zavadskas, Edmundas Kazimieras, is the most frequently cited author with 300 citations. Podvezko, Valentinas is second with 130 citations, while Fouladgar, Mohammad Majid and Yazdani-Chamzini, Abdolreza share third place with 128. Table 6 lists other authors who received more than 25 citations.

Table 6. The most cited authors

Author	Citations
Zavadskas, Edmundas Kazimieras	300
Podvezko, Valentinas	130
Fouladgar, Mohammad Majid	128
Yazdani-Chamzini, Abdolreza	128
Moini, S. Hamzeh Haji	106
Sadeghi, Arash	83
Aghdaie, Mohammad Hasan	79
Hashemkhani Zolfani, Sarfaraz	78
Jusoh, Ahmad	73
Khalifah, Zainab	73
Mardani, Abbas	73
Nor, Khalil Md	73
Cakmakci, Mehmet	62
Kahraman, Cengiz	62
Turanoglu Bekar, Ebru	62
Esmaeili, Ahmad	46
Rostamzadeh, Reza	46
Larimian, Taimaz	42

Molabashi, Ali	42
Keshavarz Ghorabaee, Mehdi	37
Nia, Arash Shahriyari	37
Saparauskas, Jonas	37
Turskis, Zenonas	37
Azar, Adel	26

Source: Author, 2023

4.4. Co-citation analysis

4.4.1. Unit of analysis: Cited references

A Co-citation analysis, Unit of analysis: Cited references, was performed to determine the most cited references in the papers studied. One thousand seven hundred ninety-four references from the 44 papers were used in the sample. A threshold of at least five citations was established. Thus, the co-citations analysis included papers cited at least five times in the 44 papers analyzed. The results can be seen in Figure 5.

Figure 5. Co-citation analysis at the publication level
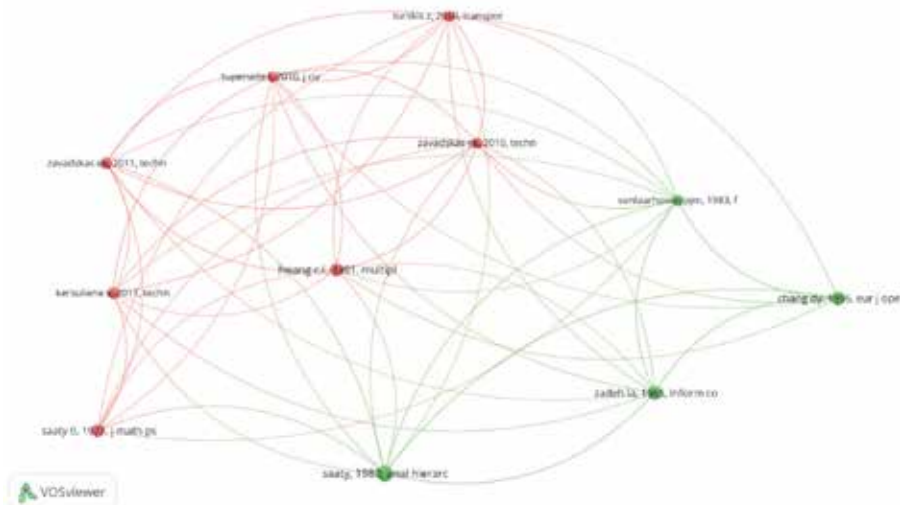
Source: Author, 2023

To obtain all the details about the papers, the complete data of the papers shown in Figure 5 are extracted and presented in Table 7.

Table 7. Co-citation analysis at the publication level

Cited reference	Citations	Total link strength
Saaty, T.L. (1980) The Analytic Hierarchy Process. McGraw-Hill, New York.	13	25
Zadeh, L.A. (1965) Fuzzy Sets. Information Control, 8, 338-353.	9	23
Chang, D.Y. (1996) Applications of the Extent Analysis Method on Fuzzy AHP. European Journal of Operational Research, 95, 649-655.	8	18
Hwang, C.L. and Yoon, K. (1981) Multiple Attribute Decision Making: Methods and Applications. Springer-Verlag, New York.	7	17
Saaty, T.L. (1977) A Scaling Method for Priorities in Hierarchical Structures. Journal of Mathematical Psychology, 15, 234-281.	7	11
Keršulienė, V., & Turskis, Z. (2011). Integrated fuzzy multiple criteria decision-making model for architect selection. Technological and economic development of economy, 17(4), 645-666.	6	17
Zavadskas, E. K., & Turskis, Z. (2011). Multiple criteria decision making (MCDM) methods in economics: an overview. Technological and economic development of economy, 17(2), 397-427.	6	18
Tupenaite, L., Zavadskas, E. K., Kaklauskas, A., Turskis, Z., & Seniut, M. (2010). Multiple criteria assessment of alternatives for built and human environment renovation. Journal of Civil Engineering and Management, 16(2), 257-266.	5	24
Turskis, Z., & Zavadskas, E. K. (2010). A novel method for multiple criteria analysis: grey additive ratio assessment (ARAS-G) method. Informatica, 21(4), 597-610.	5	23
Chanas, S. (1983). The use of parametric programming in fuzzy linear programming. Fuzzy sets and systems, 11(1), 243-251.	5	21
Zavadskas, E. K., & Turskis, Z. (2010). A new additive ratio assessment (ARAS) method in multicriteria decision-making. Technol Econ Dev Econ 16 (2): 159–172.	5	23

Source: Author, 2023

The results of the co-citation analysis show that Saaty's book from 1980, The Analytic Hierarchy Process, was referenced in 13 of the papers analyzed here. This is followed by the paper of Zadeh (1965), which was referenced in 9 papers; Chang (1996) - 8 times; Hwang and Yoon (1981), and Saaty (1977) with seven references; Keršulienė and Turskis (2011), and Zavadskas and Turskis (2011) with six references, followed by the papers by Tupenaita et al. (2010), Turskis and Zavadskas (2010), Chanas (1983), Zavadskas and Turskis (2010), each referenced five times.

4.4.2. Unit of analysis: Cited sources

Co-citation analysis was also conducted at the journal level. Nine hundred twenty-seven sources were cited in the 44 papers in the sample. The minimum threshold was set at 20 citations - a source had to be cited at least 20 times to be included in the analysis. In total, 176 sources met the required criteria. The results can be seen in Figure 6.

Figure 6. Co-citation analysis at the level of the source (the minimum threshold was set at 20 citations)
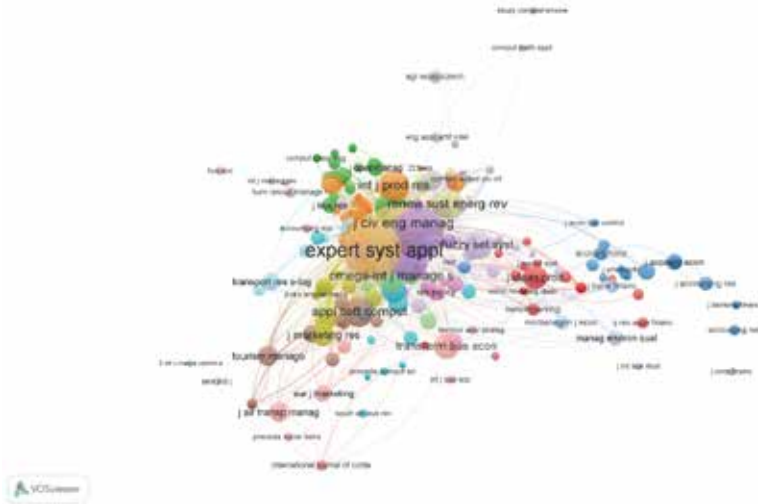
Source: Author, 2023

The complete data on the sources shown in Figure 6 were extracted and listed in Table 8 to obtain complete source information. A threshold of at least 15 citations was set. Thus, all sources cited at least 15 times in the 44 papers analyzed were included in the co-citation analysis.

Expert Systems with Applications is the most cited journal among the papers analyzed, with 83 citations. The European Journal of Operational Research (65 citations) is in second place. The journal Technological and Economic Development of Economy is in third place, with 61 citations. Other journals cited 15 times or more in the papers analyzed are listed in Table 8.

Table 8. Co-citation analysis at the journal level (The minimum threshold was set at 15 citations)

Journal	Citations
Expert Systems with Applications	83
European Journal of Operational Research	65
Technological and Economic Development of Economy	61
International Journal of Production Economics	40
Journal of Business Economics and Management	34
Journal of Civil Engineering and Management	29
International Journal of Production Research	23
Omega – International Journal of Management Science	22
Renewable and Sustainable Energy Reviews	22
Applied soft computing	21
Fuzzy sets and systems	20
Computers & Industrial Engineering	18
Transformations in Business & Economics	16
Transport - Vilnius Tech Journals	16
International Journal of Strategic Property Management	15

Source: Author, 2023

4.4.3. Unit of analysis: Cited authors

A Co-citation analysis, Unit of analysis: Cited authors, was performed to determine the most cited authors in the studied papers. The analysis revealed that 1,428 authors were cited in the analyzed papers, of which 1,413 were cited twice or more times, while the remaining 15 were cited only once. A list of authors cited in the analyzed articles can be seen in Figure 7.

Figure 7. The most cited authors

The size of the circle indicates the total frequency of the author being referenced in the papers studied, while the lines between the circles show how often two authors were cited together in the 44 papers. Thus, the thickness of the line indicates how strong the link between the two authors is. A circle near the center indicates that an author occupies a central and influential position in the author network, while a circle in the periphery indicates a less influential position (Ozturk, 2021).

As can be seen, the author Zavadskas, Edmundas Kazimieras, has a central and influential position in the author network. In order to perform a more detailed analysis of the authors cited in the analyzed papers, a threshold of at least ten citations was set in the co-citation analysis, meaning that only those authors cited at least ten times in the analyzed papers were included in the further analysis. Table 9 provides a list of these authors.

Table 9. Most frequently referenced authors in the analyzed papers

Author	Citations	Total link strength
Zavadskas, Edmundas Kazimieras	56	3,987
Saaty, Thomas Lorie	51	2,574
Hashemkhani Zolfani, Sarfaraz	23	2,221
Ginevicius, Romualdas	18	1,009
Kahraman, Cengiz	14	740
Aghdaie, Mohammad Hasan	13	1,278
Chang, Da-Yong	13	556
Opricovic, Serafim	12	971
Turskis, Zenonas	12	751
Zadeh, Lotfi Aliasker	12	812
Kersuliene, Violeta	11	1,004
Brauers, Willem K.M	10	724
Kotler, Philip	10	904
Liou, J. J. H.	10	775

Source: Author, 2023

The results of the co-citation analysis show that the author Zavadskas, Edmundas Kazimieras appears 56 times in the references of the analyzed papers. Total link strength is 3,987, the number of links of citation items for a given author with other author citations. He is followed by Saaty, Thomas Lorie, who appears 51 times in the references of the analyzed papers (total link strength is 2,574). Compared to the first-ranked author, the third-ranked Hashemkhani Zolfani, Sarfaraz appears only half as often, 23 times, while the total link strength for this author is about the same as for the second-ranked author (2,221). The data for the other most cited authors can be found in the same table.

5. CONCLUSION

This study gives an overview of papers in which the Analytic Hierarchical Process Method - AHP - is applied in business economics. The oldest paper that matched the search query dates back to 2009, and there is continuity in the publication of papers matching the studied topic up to and including 2023. Numerous bibliometric analysis methods, such as co-authorship, co-occurrence, citation, and co-citation analysis, were performed to capture keywords, citations,

and co-citations in papers applying the AHP method in business economics. The paper is a descriptive review of papers that apply the AHP method in business economics. One hundred seventeen authors wrote the papers included in the analysis. The most prolific author is Zavadskas, Edmundas Kazimieras, who authored seven papers included in the analysis, and his papers are cited the most - 300. The authors of the analyzed papers are from 21 countries.

Regarding the number of published papers, the most productive country is Iran, while Lithuania ranks first with 536 citations. Three hundred eighteen keywords were found in the studied papers. The most frequently used keyword is AHP, with 26 repetitions and a total link strength of 275. As for the number of repetitions, the word model (11 repetitions, total link strength 141) and selection (8 repetitions, total link strength 105) follow. The keyword AHP occurs in the following variants in the researched papers: AHP technique (1 occurrence, total link strength 10), analytic hierarchy (1 occurrence, total link strength 10), analytic hierarchy process (4 occurrences, total link strength 46), analytic hierarchy process (AHP) (1 occurrence, total link strength 4), analytical hierarchical process (1 occurrence, total link strength 4), and analytical hierarchy process (4 occurrences, total link strength 37). The keyword Analytic Hierarchy Process - AHP occurs 38 times in the analyzed papers, and its total link strength is 386. The most cited paper is the Application of AHP Technique by Podvezko, published in 2009 in the Journal of Business Economics and Management. The paper has been cited 130 times. The most researched and cited papers were published in the Journal of Business Economics and Management (impact factor: 2.596) - 16 papers. The journal Transformations in Business & Economics (impact factor: 1.842) ranked second in terms of the number of papers published (14 papers) but also in terms of the number of citations (118 citations). The co-citation analysis showed that 1,794 references were cited in the studied papers. The book The Analytic Hierarchy Process, published in 1980, is included in the references in 13 studied papers. The co-citation analysis also revealed that the papers listed in the references of the studied papers were published in 927 sources. The most frequently cited journal is Expert Systems with Applications, with 83 citations. The co-citation analysis also revealed that 1,428 authors were cited in the references of the observed papers. Zavadskas, Edmundas Kazimieras appears 56 times in the references of the observed papers.

The paper contributes to understanding the literature on applying the AHP method in business economics by identifying key concepts from previous re-

search, the geographical distribution of publications, and important scientific papers, authors, and journals in the field.

Future studies could analyze a larger sample of publications. Future studies that conduct a more comprehensive investigation will allow for multidisciplinary comparison. Another important observation about bibliometric studies is the sample of studies. Bibliometric studies typically use the WoS and Scopus databases to find relevant literature. In prospective studies, studies can be conducted with a larger sample. Therefore, bibliometric analysis can also be performed for the studies in the Scopus database, and a map of the area can be created.

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INNOVATION IN THE FUNCTION OF MICROECONOMIC COMPETITIVENESS OF SMALL AND MEDIUM-SIZED ENTERPRISES (SMES) IN BOSNIA AND HERZEGOVINA

Zijad DŽAFIĆ, Ph.D.
University of Tuzla, Faculty of Economics

E-mail: zijad.dzafic@untz.ba

Mirela KLJAJIĆ-DERVIĆ, Ph.D.
University of Bihać, Faculty of Economics

E-mail: mirela.kljajic-dervic@efbi.unbi.ba

Admir OMERBAŠIĆ
Tax Administration Federation of Bosnia and Herzegovina

E-mail: admir.o@live.com

Selma ŠUMAR
University of Bihać, Faculty of Economics

E-mail: selma.sumar@efbi.unbi.ba

Abstract

The research subject in this paper is the scope, content and nature of microeconomic competitiveness, the application of innovation in SMEs, and the measurement of the achieved level of microeconomic competitiveness. The research focuses on Bosnia and Herzegovina (B&H). Today, innovation and innovativeness are the main factors for the development and increased competitiveness of companies worldwide, including B&H. Innovation is critical to most businesses' long-term growth and survival, especially SMEs. The research sub-

ject is based on analyzing production, process, organizational and marketing innovations in Bosnian companies. Four hypotheses are tested concerning the first three working hypotheses, in which each of these dimensions was observed individually. In the fourth working hypothesis, the innovativeness of small and medium-sized Bosnian-Herzegovinian enterprises is conceptualized through the sum of indicators of all these dimensions.

On the other hand, microeconomic competitiveness represents a sum of indicators. Regression analysis was used to test the set hypothesis. The coefficient of determination, which shows how much of the variance of the dependent variable is explained by the model, shows that the model explains 24.4% of the variance of microeconomic competitiveness. In contrast, the statistical significance of this indicator shown in the ANOVA table (Sig.=0.000<0.05) shows that the model reaches statistical significance. The beta indicator, or its significance less than 0.05, shows that innovativeness significantly contributes uniquely to predicting the microeconomic competitiveness of small and medium-sized enterprises.

Keywords: *SME, Innovation, Microeconomic competitiveness, B&H*

JEL Classification: *G32; L25; L60; O31*

1. INTRODUCTION

The importance of SMEs lies in the fact that they contribute to growth creation, increasing productivity and the economy's wealth and raising the standard of living. This means that companies that do not innovate usually do not survive in the market. SMEs are crucial for any successful world economy and promote private property and entrepreneurial skills. By their nature, they are drivers of innovation and new employment. In this sector, 2/3 of the total number of employees in the private sector in the EU work. There are only 43,654 companies with more than 250 employees and 19,143,521 with fewer than ten employees - so-called micro-enterprises. The average European company employs six people, including the owner-manager (EC-Annual Report on European SMEs, 2014).

In B&H, a consistent system of measures, programs and institutions has not yet been created, which should enable adequate support for entrepreneurship development in the existing conditions. In the long term, this will require certain harmonization with the amendments to the Constitution and the laws

resulting from this change. Such a small number of SMEs results from the complexity of the business environment in which SMEs must develop. In Bosnia and Herzegovina, the political and legal order of the country, with one country, two entities (Federation of B&H, Republika Srpska), Brcko District, ten cantons in the Federation of B&H and municipalities, has created a particular political and legal framework for the development of economy and entrepreneurship (Džafić, 2006).

On the other hand, when it comes to the SME sector in the Western Balkan countries, the situation is entirely different because these countries have the lowest number of SMEs per capita (Đurić, 2014). The SME Policy Index is calculated based on 108 indicators that measure the strength and weaknesses of politics in the sector, and their implementation, experience and performance is measured. Priorities and convergence with the principles of the Small Business Act for Europe are set (Gračanac, 2012). The average number of SMEs per 1000 residents in the EU is over 40%. The highest percentages are within the Czech Republic (86%), Portugal (80.5%), Italy, and Spain.

On the other hand, the countries with the lowest proportion of SMEs per 1000 residents are Slovakia (7.7%) and Romania (18.9%). The EU has entrusted this sector as a primary source of innovation and new employment, a driver of growth, structural change, and progress. (Ševljak, 2007). Bosnia and Herzegovina (B&H) have poorly developed main government institutions and several institutions at the cantonal and local levels, which have their roots in the earlier socialist period. Encouraging the development of the entrepreneurial sector, given the constitutional structure of B&H, is unthinkable without the significant participation of state and entity ministries, cantonal ministries and institutions and local self-government units. (Bartlett, Cucković & Xheneti, 2014).

Schumpeter (1883-1950) emphasized that forces that generate economic development are not out of an external economic nature (natural disasters, wars, etc.), but instead, they are innovations - the introduction of new combinations of production factors. The way to reduce the decline rate and increase SMEs' added value is through innovation (OECD 2011). To achieve competitiveness, the country must develop factors and policies to create better conditions than other countries (Duspara, 2017). In modern business conditions, innovation activities are crucial to business success and contribute to increased competitiveness. In comparison with large companies, SMEs face several prob-

lems when it comes to innovation. (Baković & Ledić-Purić, 2011). Innovation can manifest as new products, processes or business systems (Crespell & Hansen, 2008). When adopting existing technologies or products, innovations can be new for companies or markets (Crespell & Hansen, 2008). Technical and administrative innovations can be distinguished. Technical innovations aim to achieve improved or entirely new products, services and processes. On the other hand, administrative innovations relate to organizational structure and administrative processes and do not necessarily affect technical innovations (Afuah, 2003). Today, innovation, research and development (R&D) are serious political ambitions in most developed and developing countries and all world regions. Global spending on research and development has continued to grow, more than doubling during the 20 years between 1996 and 2016. In 2016, total global spending on research and development increased by 3% (The Global Innovation Index 2018: 32).

In recent years, Bosnia and Herzegovina has been intensively approaching the construction of prerequisites for the SMEs and entrepreneurship development, which refers to the gradual introduction of a market system of economy, economic freedoms, private property, and innovations (Džafić & Bejić, 2012). In order to measure index the development of SMEs in transitional countries, the European Commission (UN/ECE) adopted the Index of SME Development. This complex economic indicator includes the share of the private sector in the total economy, the share of SMEs in GDP, and the share of employees in SMEs in the total number of employees in the country (European Commission, n/a).

2. LITERATURE REVIEW AND RESEARCH FRAMEWORK

Based on the research problem and previous research, the critical question is whether innovative SMEs can contribute to the microeconomic competitiveness of SMEs in Bosnia and Herzegovina. This research aims to determine innovative SMEs' role, importance, and impact on the microeconomic competitiveness of enterprises in Bosnia and Herzegovina. Specific/operational goals of the research include: investigating existing scientific knowledge and achieved contributions from the field of economic theory in the segment of SME innovation and microeconomic competitiveness, analyzing the impact of innovation on the microeconomic competitiveness of enterprises, analyzing product, process,

marketing and organizational innovations, and highlighting the importance of SME innovation through experiences from developed countries and their connection with the concept of microeconomic competitiveness.

White et al. (1988), one of the pioneering researchers in innovation, present clear evidence of a significant link between the degree of innovation and enterprise growth. Kleinschmidt and Cooper (1991) state that entrepreneurship innovativeness is critical to their market success. With these mentioned authors, Lumpkin and Dess (1996) also agree that organizational innovativeness's capacity positively impacts enterprises' growth. In their research, Neely and Hii (1998) present findings that a company's tendency towards developing new products and services (a high degree of innovation) leads to its faster adaptation in the context of market changes. Considering that innovation in its "nucleus" implies the permanent development of new products and services, business processes and business models, only an approach to modern business leads to sustainable performance in today's complex and dynamic environment (Cottam et al., 2001). Educated people are promising innovators, so education accelerates the process of technological diffusion. Experience and added education will increase the level of learning through work. The experience implied in the human factor is highly valued for innovation. The possibilities in human resources thus become essential elements for applying technology and knowledge to creating products and services (Little et al., 2017).

In addition to the mentioned authors, authors (Leonidou, Katsikeas & Samiee 2002; Faco & Csillag; 2010; Soliman, 2011) present clear evidence of a significant relationship between the degree of a company's inclination towards innovation on the one hand and the growth and development of the company on the other hand, which leads to an increase in microeconomic competitiveness. The famous American theorist Porter (2008) mentioned four factors of competitiveness, which he calls a diamond that affects labor productivity, i.e., the company's competitive advantage, and they are: factor conditions, demand conditions, firm strategy, structure, and rivalry. Piza et al. (2016) state that The World Bank invested over $40 billion in SMEs between 2006 and 2012, which best reflects the seriousness of efforts to improve it.

Regarding innovation, Bozić and Rada (2005) claim that there is a statistically strong positive relationship between innovation and the business performance of SMEs in Croatia. In their study, Dobbs and Hamilton (2006) pres-

ent clear empirical evidence that supports the statement that innovation is the basic "lever" of the growth and development of small manufacturing companies. Mbizi et al. (2013), in their research, on a sample of 300 small and medium-sized enterprises, concluded that the primary determinant of the long-term microeconomic competitiveness of the companies is their degree of innovation. Eggert, Thiesbrummel and Deutscher (2014), on a sample of 558 manufacturing SMEs in Germany, concluded that innovation is statistically positively associated with a company's business. Bi and Li (2015), in their study on a sample of 377 industrial SME representatives in China, present findings that indicate a positive impact of innovation on the growth and development of companies.

The goal of forming an innovation index is to measure individual countries' achieved level of innovation based on two sub-indices: the Innovation Input Index and the Innovation Output Index. Each of these sub-indices is constructed from pillars. Each pillar is divided into sub-pillars. Together, they comprise the Global Innovation Index as the average sum of the innovation introduction sub-index and the innovation results sub-index (The Global Competitiveness Report, 2016- 2017; World Economic Forum, Geneva, 2017). According to Freeman and Soete (1997), innovation is a process of adaptation that begins in the minds of creative people and materializes in new products, processes or services. Business based on innovation and knowledge is crucial in promoting prosperity, creating but retaining companies' competitive advantage. Special attention is paid to the criteria relevant to determining the level of competitiveness and innovative ability of individual countries, emphasizing the position of Bosnia and Herzegovina (Jovičić & Mirković, 2016).

3. METHODOLOGY

The microeconomic competitiveness of SMEs has been operationalized through the business performance of enterprises. Indicators were measured using a Likert five-point scale, and the variable's value will imply the sum of individual responses or values of thirteen corresponding indicators. As a basic framework for statistical research on innovative activities of enterprises in the period 2016-2020, for which information the data was collected, the data on enterprises from the statistical business register from the manufacturing industry sector, IT sector, service sector, trade sector, etc. has been obtained. The sample size on which statistical research was conducted included 300 small and

medium-sized enterprises. The statistical survey was conducted on a sample stratified by company size: small, medium-sized, and large companies according to the classification of activities in B&H.

3.1. Population and sample

The collection of primary data was carried out by using a survey. This was done partly in electronic form, using the Google Forms platform, while the other part of the survey was collected in direct contact with respondents. Responses were collected from a total of 126 respondents, out of which, due to observed irregularities in terms of missing responses, 19 surveys had to be excluded from further analysis. Hence, the research used data obtained from a sample of 107 respondents. The survey used in the research consisted of several parts, so through segmented parts of the same, answers were collected about demographic characteristics of respondents, characteristics of the company, product innovations, process innovations, current or abandoned innovative activities, innovative activities and expenditures, sources of information for innovative activities, effects of innovations, factors that hinder innovation activities, organizational and marketing innovations, business performance of the company and ease of doing business in Bosnia and Herzegovina.

3.2. Hypothesis

The central scientific hypothesis that will prove or reject the main theoretical positions in the work is that the quality of the business environment, the sophistication of production, and the company strategy directly affect microeconomic competitiveness. From this formulated main research hypothesis, the goal is to observe the microeconomic competitive ability of companies as a dependent variable through several fundamental aggregates listed below and innovation as an independent variable. Indicators of the independent hypothesis are product, process, organization and marketing innovation in B&H companies.

The quality of the business environment, the sophistication of production and the company strategy will be operationalized through the sum of 12 indicators marked in the survey as elements of ease of doing business in B&H.

Figure 1 Graphical representation of the formulated hypothesis
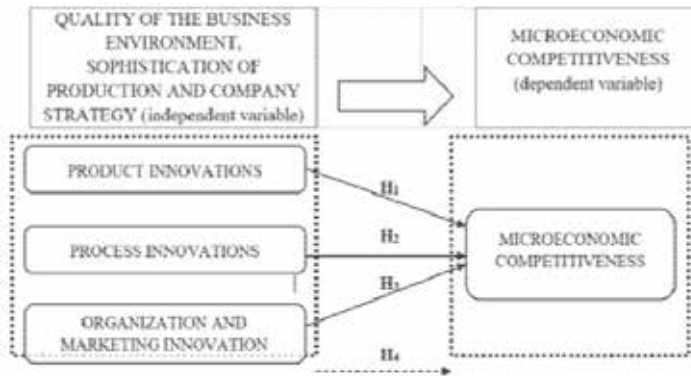
Source: Author

Auxiliary hypotheses are formulated as follows:

H1 - Product innovation affects the microeconomic competitiveness of small and medium-sized enterprises in Bosnia and Herzegovina.

H2 - Process innovation affects the microeconomic competitiveness of small and medium-sized enterprises in Bosnia and Herzegovina.

H3 - Organization and marketing innovation affect the microeconomic competitiveness of small and medium-sized enterprises in Bosnia and Herzegovina.

H4 - Innovative small and medium-sized enterprises contribute to increasing the microeconomic competitiveness of companies in Bosnia and Herzegovina.

The formulated auxiliary hypothesis is a prerequisite for scientific confirmation of the central hypothesis. The main goal is achieving high and sustainable economic development for B&H's more significant commitment to innovation and competitiveness through stimulating knowledge-based growth, as knowledge and innovation are considered the main competitive advantage. As indicators of the quality of the microeconomic business environment, the previously listed ease of doing business indices has been used.

3.3. Statistical analysis

Heaving in mind that the measuring instrument used in our research covers different segments and elements of innovation (product innovation, process innovation, current or abandoned innovative activities, innovative activities and

expenditures, sources of information and cooperation for innovative activities, effects of innovations, factors that hinder innovation activities, organizational and marketing innovations), microeconomic competitiveness of SMEs and ease of doing business in Bosnia and Herzegovina a descriptive statistical analysis was performed whose results will be presented in this paper. For clarity and systematic interpretation, they will be presented separately according to measurement scales and segments conceived by the survey.

4. RESULTS

4.1. Descriptive statistical indicator of product innovation (product or service)

Product innovation involves the market introduction of a new good or service or a significant improvement of a good or service concerning capabilities such as improved software, user-friendliness, components or subsystems. Therefore, in this part of the survey, the first questionnaire asked respondents to assess whether in the past five years, i.e., in the period from 2016 to 2020, the company they are employed in had introduced a new or significantly improved good (excluding simple resale of new goods purchased from other companies and changes of exclusively esthetic nature) and/or new or significantly improved services.

The success of innovations can be measured through various effects such as revenue from the sale of new products and services, customer satisfaction, return on research and development investment, higher margin, number of new products or services, etc., whereby these are not mutually exclusive options. Therefore, respondents were left, through the possibility of multiple selections in the survey questionnaire, to identify how the success of innovations is measured in the companies in which they are employed. The distribution of responses is shown in the following Table 1.

Table 1 Distribution of enterprises according to the way how the success of innovation is measured

How the success of innovations is measured in the company	number of companies	% of companies
through revenue from new products and services	33	30.84
through customer satisfaction	12	11.21
through return on research and development investment	4	3.74
through higher margin	26	24.30
through the number of new products or services	13	12.15
through something else	2	1.87
mentioned practice is not represented in the company	7	6.54
through revenue from new products and services and through customer satisfaction	4	3.74
through revenue from new products and services and through higher margin	1	0.93
through revenue from new products and services and through the number of new products/services	2	1.87
through revenue from new products and services, customer satisfaction and the number of new products/services	2	1.87
through revenue from new products and services, through higher margins and the number of new products/services	1	0.93
Total	107	100.00

Source: Author

Based on the presented distribution, it can be seen that one part of the respondents (9.34%), while answering this question, identified more than one way of measuring the success of innovations in the company. With the aim of generalizing and summarizing the results of this part of the analysis, and fear of possible misinterpretations and drawing conclusions based on the previous Table 1, the number and percentage of companies that apply each of the individual modalities of answers or ways of measuring, independently or in their mutual combination, were calculated. The results are shown in Table 2.

Table 2 Frequency of application of individual ways of measuring the success of innovations.

	number of companies	% of companies
through revenue from new products and services	43	40.19
through customer satisfaction	18	16.82
through return on research and development investment	4	3.74
through higher margin	28	26.17
through the number of new products or services	18	16.81
through something else	2	1.87

Source: Author

The success of a company's innovations is most often measured through revenue from the sale of new products and services (40.19%), higher margins (26.17%), customer satisfaction (16.82%) and the number of new products or services (16.81%). On the other hand, a significantly smaller percentage of companies were recorded that measure the success of innovations through research and development investment (3.74%) or some other way (1.87%).

When it comes to product innovation, the highest degree of agreement among respondents was shown in the statement, "There is excellent coordination among departments in the company," where 45.79% of respondents answered "partially agree" and 42.99% of them "completely agree". "Employees are not punished in the company in case their innovation brings negative business results", where the answers of 87.85% of respondents were recorded in the agreement zone since 50.47% of respondents answered "partially agree," and 37.38% of them stated that they "completely agree."

Besides frequency distribution, descriptive statistical indicators were calculated for each indicator individually, and the results are shown in the following fields. The ranking of indicators in the overview of descriptive indicators is, unlike the overview of the distribution of answers in which they are presented in the order in which it was conceived by the survey questionnaire, performed according to the obtained average value.

4.2 Descriptive statistical indicators of process innovation (production)

Process innovation is implementing a new or significantly improved production process, distribution method or support activity for the company's goods or services. When evaluating it, respondents were given a note that the innovation must be new to their company, but not necessarily to the sector in which the company operates or the market where it delivers its products and/or services, and that it is irrelevant whether the innovation was initially developed by their or another company.

Table 3 Company's structure based on the introduction of innovation processes

Did the company introduce new or significantly improved		number of companies	% of companies
goods and services production methods	yes	103	96.26
	no	4	3.74
logistics, delivery or distribution methods for inputs, goods or services	yes	74	69.16
	no	33	30.84
supporting activities for processes, such as maintenance systems or operations for purchasing, accounting or computing	yes	70	65.42
	no	37	35.51

Source: Author

96.26% of companies in the research sample introduced new or significantly improved methods of producing goods or services as a type of process innovation, 69.16% of them introduced logistics, delivery or distribution methods for inputs, goods or services, and 65.42% of companies introduced supporting activities for processes, such as maintenance systems or operations for purchasing, accounting or computing. Interestingly, when looking at all these process innovations simultaneously, no company in the research sample did not introduce at least one of them.

Two statements respectively indicators for which the results showed the highest degree of agreement among respondents are: 'The company has introduced new or significantly improved logistics, delivery or distribution methods for inputs, goods or services' with 73.83% of answers 'partially agree' and 14.02% of answers 'completely agree', and 'The company develops processes for creating new products and services' with 36.45% of answers 'partially agree' and 20.56% of answers 'agree entirely. As well as with product and process innovation indicators, the descriptive statistical indicators were calculated, and the results are presented in Table 4.

Table 4 Descriptive statistical indicators of process innovation

Indicator	Average	Median	Mode	Standard deviation
The company has introduced new or significantly improved production or manufacturing methods of goods or services.	3.68	3.00	3	0.886
The company has introduced new or significantly improved logistics, delivery or distribution methods for inputs, goods or services	3.96	4.00	4	0.672
The company develops processes for creating new products and services.	3.74	4.00	3	0.839
The number of employees in production is much higher compared to the industry average	3.02	3.00	4	1.000
The company has introduced new or significantly improved supporting activities for processes, such as maintenance systems or operations for purchasing, accounting or computing	3.38	3.00	3	0.897
The increase in employment of highly educated personnel in the company is much higher than the industry average.	2.79	3.00	2	1.037

Source: Author

Based on the presented results, it can be concluded that within the indicators of process innovation, companies have mainly introduced new or improved logistics, delivery or distribution methods for inputs, goods or services (3.96) and developed processes for creating new products and services (3.74). These two indicators also recorded the lowest variability of responses within this category of innovations. On the other hand, process innovations are least evident through a higher number of employees in production compared to the industry average (3.02) and a higher increase in employment of highly educated personnel compared to the industry average (2.79), as evidenced by the average mean values in the zone of respondents' indifferent attitude.

4.3. Descriptive statistical indicators of current or abandoned innovative activities

With the note that innovation activities include the acquisition of machinery, equipment, software and licenses, engineering and development work, training, marketing and R&D when undertaken explicitly for the development and/or implementation of product or process innovation, in this part of the questionnaire respondents had the opportunity to evaluate whether the company they are employed in had any innovative activities for the development of product or process innovations that were abandoned or are still ongoing in the period from 2016 to 2020.

According to the presented results, occasional research and development was conducted by 93.46% of companies, while continuous research and development was conducted by 6.54% of companies. This process involves creative work undertaken in the company to increase the stock of knowledge and its use for designing new or improved products and processes. Extramural research work, in the sense of all these activities but performed by other companies or other companies within the group, public or private research organizations, and purchased by the company, was conducted by only 6.54% of companies. The acquisition of advanced machinery, equipment and computer hardware or software for producing new or significantly improved products and processes was realized by 92.52% of companies. In comparison, 15.89% of companies decided to purchase or license patents and unpatented inventions, knowledge and other types of knowledge from other companies or organizations.

Table 5 Descriptive indicators of sources of information for innovative activities

	Sources of innovation that provided information for new innovative projects or contributed to the completion of existing ones	Average	Median	Mode	Standard deviation
Internal sources	within a company or group of companies	3.70	3.00	3	0.903
Market sources	equipment, materials, components or software suppliers	2.41	2.00	2	0.931
Clients or buyers	Competitors or other companies from the same sector	2.75	3.00	3	1.001
	consultants, commercial laboratories or private research and development institutes	3.76	4.00	4	0.970
Institutional sources	universities or other institutions of higher education	2.56	2.00	2	0.963
Other sources	conferences, fairs, exhibitions	4.15	4.00	4	0.899
	scientific journals and professional/technical publications	3.52	3.00	3	0.894
	professional and industrial associations	2.93	3.00	4	0.997

Source: Author

The most significant sources of information for new or contributing to the completion of existing innovative projects of Bosnian and Herzegovinian companies are conferences, fairs and exhibitions (4.15), consultants, commercial laboratories or private research and development institutes (3.76) and internal sources of information located within the company or group (3.70). On the other hand, market and institutional sources of information were rated as the least used.

Since innovations are considered one of the main drivers of company growth and success, it is expected that innovations in companies will lead to an increase in market share, improved quality, reduced material costs per unit of product and many other effects and impacts. In our research, they are divided into three groups.

Table 6 Descriptive indicators of source information indicators for innovative activities

		Average	Median	Mode	Standard deviation
effects focused on the product	increased range of goods or services	4.21	4.00	4	0.673
	increased market share or entry into new markets	4.03	4.00	4	0.557
	higher quality of goods or services	4.17	4.00	4	0.680
	greater flexibility in production or service provision	3.66	4.00	3	0.739
effects focused on the process	increased production or service provision capacity	3.68	4.00	4	0.695
	reduced labor costs per unit of production	3.79	4.00	3	0.858
	and reduced material and energy per unit of output	3.61	3.00	3	0.939
other effects	impact on the environment or improved health and safety	3.77	4.00	4	0.708

Source: Author

The results showed that the effects of innovation are evident through all observed types since an average value above the neutral attitude or in the zone of respondents' agreement was obtained for all of them. However, they are mainly manifested through the product.

4.4. Descriptive statistical indicator of organizational and marketing innovations

Organizational innovation is the implementation of new or significant changes in the structure of a company or management methods aimed at improving the use of company knowledge, the quality of goods and services or the efficiency of workflows. On the other hand, marketing innovation is the application of new or significantly improved designs or sales methods to increase the attractiveness of goods and services or to enter new markets. Organizational and marketing innovations are operationalized through eleven different indicators.

When looking at all indicators of organizational and marketing innovations, the highest average rating among them was the statement 'The innovation strategy is clear and known to all employees', with 4.02, while the lowest average value was the statement 'The value of the company's brand is much higher compared to the industry average' with an average value of 3.03. The modes of these variables (the most common values in the series) and medians (the middle of the distributions) are 3 and 4. Standard deviations range from 0.743 to 1.116, which tells us that some indicator ratings have significant deviations from the arithmetic mean, i.e., a dispersion greater than 1.

4.5. DESCRIPTIVE STATISTICAL INDICATORS OF THE COMPANY'S BUSINESS PERFORMANCE

A company's business performance represents an assessment of its success in the past period and an assessment of the need for specific actions to improve future results. The performance of companies in B&H was observed through thirteen indicators: profitability, market share growth, return on investment, revenue from projects and profit compared to the industry average, increased productivity, general liquidity, the number of new and improved products and projects and the number of employees, reduced employee turnover, lower prices compared to the competition, and access to the latest knowledge and information in the industry.

By analyzing the obtained results, we notice that the values of arithmetic means range from 2.75 to 3.65, with the variability of percentages ranging between 0.660 and 1.244. According to the obtained results, ranking of business performance according to the corresponding average value of their expression in small and medium Bosnian-Herzegovinian enterprises can be performed in different ways shown below.

In the first working hypothesis, the subject of research was testing the impact of product innovation (goods and/or services) on the microeconomic competitiveness of small and medium-sized enterprises. Testing of the set research hypothesis was performed using regression analysis. Product innovation is a variable operationalized through the third part of the questionnaire. The measurement was performed by assessing the degree of innovation through Likert's five-point scale of responses for a total of twenty-two indicators, so the value of the variable for this part of the research is defined as the sum of individual

responses to these indicators. The microeconomic competitiveness of small and medium-sized enterprises is operationalized through the business performance of enterprises. Here too, indicators were measured using Likert's five-point scale of responses, and the variable value implies the sum of individual responses or values of thirteen corresponding indicators.

The overall results of the regression analysis are attached to the paper. In contrast, their crucial part will be shown below due to their volume and to ensure the paper's clarity and systematicity.

Table 7 Model summary for product innovations

Model summary[b]				
Model	R	Coefficient of determination	Adjusted coefficient of determination	Standard error
1	0,322[a]	0.104	0.095	4.32773
a. Predictor: PRODUCT INNOVATIONS				
b. Dependent variable: MICROECONOMIC COMPETITIVENESS				

Source: Author

Table 8 ANOVA

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression part	227.725	1	227.725	12.129	0.001
	Residual part	1966.574	105	18.729		
	Total	2194.299	106			

Source: Author

The coefficient of determination shows how much of the variance of the dependent variable is explained by the model. In our case, the model explains 10.4% of the variance in microeconomic competitiveness. The statistical significance of this indicator is shown in the ANOVA table (Sig.=0.001<0.05) and shows that the model achieves statistical significance.

Next, we want to know how much a variable in the model contributes to predicting the dependent variable, which is shown by the beta indicator in part Table 9. which shows standardized coefficients. In our case, product innovation makes a significant unique contribution to predicting the microeconomic competitiveness of small and medium-sized enterprises.

Table 9 Regression analysis coefficients of the model of the impact of product innovation on the microeconomic competitiveness of SMEs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	St. error	Beta		
1	(Constant)	25.748	4.634		5.556	0.000
	PRODUCT INNOVATIONS	0.227	0.065	0.322	3.487	0.001

Source: Author

Based on everything stated above, the first working hypothesis is accepted, and it can be concluded that product innovation affects the microeconomic competitiveness of small and medium-sized enterprises in Bosnia and Herzegovina.

The second working hypothesis relates to the research on the impact of process innovation on the competitiveness of small and medium-sized enterprises.

The complete results of the regression analysis are attached to this paper, and its vital part is shown below.

Table 10 Model summary process innovations

Model summary[b]				
Model	R	Coefficient of determination	Adjusted coefficient of determination	Standard error
1	0,505[a]	0,255	0,248	3,94452
a. Predictor: PROCESS INNOVATIONS				
b. Dependent variable: MICROECONOMIC COMPETITIVENESS				

Source: Author

Table 11 ANOVA

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression part	560.578	1	560.578	36.029	0.000
	Residual part	1633.722	105	15.559		
	Total	2194.299	106			

Source: Author

The results show that the model explains 25.5% of the variance of microeconomic competitiveness, and the statistical significance of that indicator shown

in the ANOVA table (Sig. = 0.000 <0.05) shows that the model achieves statistical significance. The results of the regression coefficients are in Table 12.

Table 12 Regression analysis coefficients of the model of the impact of process innovation on the microeconomic competitiveness of SMEs

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	St. error	Beta		
1	(Constant)	23.112	3.143		7.353	0.000
	PROCESS INNOVATIONS	0.910	0.152	0.505	6.002	0.000

Source: Author

The obtained result of significance less than 0.05 shows that process innovation is a significant unique contribution to the prediction of microeconomic competitiveness of small and medium-sized enterprises.

The third working hypothesis explores the relationship between organizational and marketing innovations on the one hand and the macroeconomic competitiveness of small and medium-sized enterprises on the other. Part of the regression analysis results related to evaluating the model of the impact of organizational and marketing innovation on microeconomic competitiveness is below.

Table 13 ANOVA

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression part	254.859	1	254.859	13.798	0.000
	Residual part	1939.440	105	18.471		
	Total	2194.299	106			

Source: Author

The results show that the model of the impact of organizational and marketing innovation on microeconomic competitiveness explains 11.6% of the variance of microeconomic competitiveness, and the statistical significance of that indicator shown in the ANOVA table with a value less than 0.05 shows that the subject model achieves statistical significance. Table 18 shows the results of the regression coefficients.

Table 14 Regression analysis coefficients of the model of the impact of organizational and marketing innovation on the microeconomic competitiveness of SMEs

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	St. error	Beta		
1	(Constant)	28.514	3.612		7.894	0.000
	ORGANIZATIONAL AND MARKETING INNOVATION	0.341	0.092	0.341	3.715	0.000

Source: Author

The obtained significance result of less than 0.05 shows that organizational and marketing innovations significantly contribute uniquely to predicting the microeconomic competitiveness of small and medium-sized enterprises.

The main research question explores the relationship between the quality of the business environment, the sophistication of production, company strategy, and the macroeconomic competitiveness of small and medium-sized enterprises. The quality of the business environment, the sophistication of production, and company strategy are a variable operationalized through a sum of twelve indicators marked as elements of ease of doing business in B&H in the survey questionnaire, six indicators marked as elements of process innovation (production) in the survey questionnaire, and three indicators related to company strategy.

Table 15 The model summary of the quality of the business environment, the sophistication of production and the company strategy

Model summary[b]				
Model	R	Coefficient of determination	Adjusted coefficient of determination	Standard error
1	0.369[a]	0.136	0.128	4.24963
a. Predictor: THE QUALITY OF THE BUSINESS ENVIRONMENT, THE SOPHISTICATION OF PRODUCTION AND THE COMPANY STRATEGY				
b. Dependent variable: MICROECONOMIC COMPETITIVENESS				

Source: Author

The coefficient of determination, which shows how much of the variance of the dependent variable is explained by the model, is 0.136, which means that the model explains 13.6% of the variance of microeconomic competitiveness of small and medium-sized enterprises. The next thing we want to know is

how much the variable quality of the business environment, sophistication of production and company strategy in the model contributes to predicting the dependent variable, shown by the beta indicator in Table 16, which shows standardized coefficients.

Table 16 Regression analysis coefficients of the model of the influence of the quality of the business environment, sophistication of production and the company strategy on microeconomic competitiveness

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	St. error	Beta		
1	(Constant)	28.827	3.230		8.926	0.000
	THE QUALITY OF THE BUSINESS ENVIRONMENT	0.215	0.053	0.369	4.063	0.000

Source: Author

Based on everything mentioned above, the central research hypothesis is accepted, and it is concluded that the quality of the business environment, sophistication of production and company strategy affect the microeconomic competitiveness of small and medium-sized enterprises in Bosnia and Herzegovina.

5. DISCUSSION

Looking more broadly, we can conclude that small and medium-sized enterprises are today one of the cornerstones of the EU's economic development. For countries in transition, they are the primary factor in the development of a competitive economy. Their importance is reflected in generating total revenues, new value, increasing exports and employment, creating new products and services, innovating products, operations, operations, flexibility through rapid adaptation to market demands and stimulating the development of entrepreneurial skills and business models.

What may be most worrying is that B&H has not achieved any visible improvements in the last five years. Otherwise, this dimension of innovation for SMEs includes four sub-dimensions: a political framework for innovation, government institutional support and service for innovative SMEs, and cooperation between research institutions and SMEs in technology transfer. In B&H, a strategic approach to coordinated innovation policy has not been developed, nor

has there been implementation of innovative policies. Incubators, accelerators, and technological services for newly established SMEs are very low. Also, direct and indirect financial support is insufficiently developed. Innovative voucher schemes and grants, institutional infrastructure for cooperation between industry and universities, and intellectual property rights almost do not exist in B&H. Framework policies for innovation and research and development policy are implemented at the entity level.

The statistical processing of the collected primary data for this research determined the possibility of accepting or rejecting the set hypotheses. The microeconomic competitiveness of small and medium-sized enterprises was operationalized through the business performance of enterprises. Microeconomic competitiveness refers to the efficiency of Bosnian-Herzegovinian companies in offering their products and services in a market with international competition. It acts directly on the level of productivity of enterprises. The most critical components of microeconomic competitiveness are the design of business and company strategy, the quality of the national business environment and the state of cluster development. Since the productivity of its enterprises determines a country's productivity, an economy can only be competitive if the enterprises operating in it are competitive regardless of size.

Based on everything mentioned above, all set hypotheses have been confirmed. The coefficient of determination in the first working hypothesis shows how much of the variance of the dependent variable is explained by the model. In our case, the model explains 10.4% of the variance of microeconomic competitiveness. The results show that the model explains 25.5% of the variance of microeconomic competitiveness, and the statistical significance of this indicator shown in the ANOVA table (Sig.=0.000<0.05) shows that the model achieves statistical significance. The obtained significance result of less than 0.05 shows that process innovation significantly contributes uniquely to predicting the microeconomic competitiveness of small and medium-sized enterprises. Finally, the fourth auxiliary hypothesis is accepted, and it is concluded that innovative small and medium-sized enterprises contribute to increasing the microeconomic competitiveness of enterprises in Bosnia and Herzegovina.

6. CONCLUSION

In conclusion, we can say that there is a positive relationship between the quality of the business environment, the sophistication of production and company strategy on the one hand and the macroeconomic competitiveness of small and medium-sized enterprises on the other. The quality of the business environment, sophistication of production and company strategy is a variable operationalized through the sum of twelve indicators marked in the questionnaire as elements of ease of doing business in B&H. These six indicators were marked in the questionnaire as elements of process innovation (production), and three indicators related to company strategy. An interval scale of Likert type was used to measure each of these indicators, so regression analysis was used to test the research hypothesis here. The coefficient of determination, which shows how much of the variance of the dependent variable is explained by the model, is 0.136, which means that the model explains 13.6% of the variance of microeconomic competitiveness of small and medium-sized enterprises. Statistical significance or significance obtained at a value less than 0.05, shown in the ANOVA results section, shows that the model reaches statistical significance. The next thing we determined is how much the variable quality of business environment, sophistication of production and company strategy in the model contributes to predicting the dependent variable, which is shown by the beta indicator with 0.369 in the part showing standardized coefficients. If the significance is less than 0.05, the variable uniquely contributes to predicting the dependent variable. Therefore, it was proven that the quality of the business environment, sophistication of production and company strategy affect the microeconomic competitiveness of small and medium-sized enterprises in Bosnia and Herzegovina.

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NON-FINANCIAL PERFORMANCE DISCLOSURE: EVIDENCE FROM ROMANIAN LISTED COMPANIES

Adelina FOMETESCU, PhD. Student
West University of Timisoara/Doctoral School of Economics and Business Administration

E-mail: adelina.fometescu97@e-uvt.ro

Camelia-Daniela HATEGAN, Ph.D.
West University of Timisoara/Accounting and Auditing Department

E-mail: camelia.hategan@e-uvt.ro

Abstract

Non-financial performance refers to measuring and evaluating an organization's performance in areas unrelated to financial metrics. This includes sustainability, employee engagement, customer satisfaction and innovation. The goal of performance management in sustainability is to ensure that the organization is meeting its sustainability goals and contributing to a more sustainable future. The primary purpose of this paper is to analyze how performance management in sustainability is disclosed in the non-financial reports for the period 2019-2021, of a sample of energy and oil companies listed on the Bucharest Stock Exchange, by identifying the key performance indicators reported. The research results showed that performance management in sustainability is becoming increasingly crucial for companies as stakeholders seek information on how companies address environmental and social issues and face increasing pressure to reduce their environmental footprint and contribute to a more sustainable future. By implementing effective performance management in sustainability, organizations can improve their reputation, attract investment and contribute to a more sustainable future.

Keywords: non-financial, performance, disclosure, management, sustainability

JEL Classification: M14, M40, M49

1. INTRODUCTION

When discussing the impact of an organization's activities on the environment, we talk about environmental factors. The social context in which a business operates includes not only its employees and customers but also its suppliers and the communities in which they operate. Business management checks and balances, communication with investors, and the relationship between shareholders and the company's top executives are all aspects of corporate governance (Adebanjo et al., 2016).

This study evaluates the potential correlations between ESG disclosure and the market value (Velte, 2017) of publicly traded companies in Romania's energy and hydrocarbon industries.

Oil and gas extraction are the dominant sources of energy, and those industries are aware of the need to switch to a more environmentally friendly energy production model (Giese et al., 2019). Companies have acknowledged their vital role in battling environmental and social issues related to their production and consumption. As a result, they have implemented more rules and laws about sustainability in response to the rising demand from stakeholders (Galpin et al., 2015).

This research investigates the web of connections between corporate social responsibility and financial strategy for businesses, allowing us to dive more deeply into such connections (Ramírez-Orellana et al., 2023).

This study aims to determine whether or not factors related to the environment, society, and governance affect the value of oil and gas companies in Romania. Additionally, the study will investigate the effects of these factors on their financial results and market risk, two factors known to influence market value. In addition, the research aims to assess whether social, governance, and environmental elements influence market value (Velte, 2019).

Previous studies have looked at the correlations between the dimensions individually and independently. However, those studies did not use the environmental, social, and governance scores individually and separately (Walton, 2022). The relevance of the current study lies in the fact that it highlights all these interactions simultaneously, revealing that there is a far larger category of models.

The paper is structured as follows: section 2 includes the literature review, the research methodology, and the results obtained. The last section is reserved for the conclusions with a summary of the most relevant findings and a discussion of the limits of the research as well as possible new pathways for exploration into the issue.

2. NON-FINANCIAL PERFORMANCE DISCLOSURE. OVERVIEW OF RESEARCH ON ESG ACTIVITIES

2.1. Literature Review

In a study prepared by the United Nations in 2006 on the Principles of Responsible Investment, ESG concerns were raised for the first time. At that time, ESG criteria were included in the process corporations use to evaluate their financial performance to stimulate investment in sustainable practices.

Even though ESG started to play a significant role in the process of evaluating firms for investing purposes, as early as 1960, some investors began to eliminate shares of companies or whole sectors from their portfolios based on criteria such as membership in the apartheid government in South Africa or the manufacturing of tobacco products.

To transpose ESG criteria into something that can be measured and provide businesses with assistance in realistically approaching sustainability, several separate organizations have developed frameworks to assist businesses in putting sustainability principles into practice (Adebanjo et al., 2016). Literature supports measuring a company's performance and achievement in social, environmental, and economic terms. Many studies have examined how CSR efforts affect financial performance, market risk, corporate value, and the cost of capital (Ortas et al., 2015).

Stakeholder and agency theories have been used to evaluate corporate CSR practices. The stakeholder theory says corporations should meet stakeholder interests, whereas the agency theory says CSR may indicate agency difficulties within the organization. Due to environmental and social concerns, hazardous industries are under growing pressure to practice CSR. Oil and gas (O&G) companies are conscious of needing a more sustainable energy strategy. Com-

panies adopted stronger sustainability strategies to address environmental and social issues related to production and consumption.

Since 2006, when the new legislation required CSR for the first time, interest in the sustainability of corporations has steadily increased. The performance of social and environmental obligations has become a crucial criterion for determining the sustainability of an organization due to the rise of environmental and social concerns.

However, empirical findings regarding the relationships between sustainable management activities and financial performance appear inconsistent, if not contradictory (Sultana et al., 2018).

Previous studies have uncovered essential factors acting as mediators and moderators in the links between ESG activities and performance. On the other hand, there have not been many empirical studies on the precise pathways by which companies' sustainable management activities positively impact their economic performance or the circumstances in which the efficiency of sustainable governance operations may be strengthened. This needs to be investigated further (Ortas et al., 2015). In conclusion, the results of previous research have been extrapolated and applied without distinction to established and developing economies, even though most previous studies have drawn their samples from businesses in industrialized countries.

In developing nations, "the political, economic, social, cultural, and institutional systems differ from those of developed nations" (Almeyda & Darmansya, 2019), so applying the findings of previous studies to companies in developing nations can pose practical difficulties. Therefore, additional investigation is required for companies in emerging nations.

ESG has been presented as an all-encompassing normative framework for achieving sustainability. The Global Reporting Initiative (GRI) Standard is an international benchmark for sustainable financial, environmental, and social management management (Zhang et al., 2020). The theory of environmentally friendly management is defined on three distinct levels: economic performance, environmentally sound manufacturing, chemicals, greenhouse gas emissions, resource preservation, and toxin reduction. A third definition of sustainable management characterizes corporate operations to increase stakeholder communication, attaining economic benefits, and protect environmental and social integrity. This definition focuses on the stakeholders rather than the environ-

mental and social integrity (Friede et al., 2015). The ESG framework is primarily employed to conduct corporate sustainability assessments. During these evaluations, a firm's sustainability is determined by first classifying the organization into one of three categories.

The legitimacy, stakeholder, and institutional theories describe how an organization is driven to interact with its internal and external stakeholders to adapt to a changing environment and exploit opportunities (Zhao et al., 2018).

An environment with regulatory mechanisms that create distinct participants and action processes is characterized by institutional theory as a shared system with normative and representational norms (Ahmad et al., 2021). Both official and informal pressure from other firms may lead to coercive isomorphism, but confusion about what constitutes efficient or successful activity can lead to imitative isomorphism. According to institutional theory, institutional isomorphism results from companies' choices and activities being driven by worries over their legitimacy. This leads to the phenomenon known as institutional isomorphism. The legitimacy, stakeholder, and institutional theories explain phenomena based on "adaptation" to a particular component of the firm's interactions and surroundings. Adaptation may take several forms (Dalal & Thaker, 2019).

2.2. Research Methodology

The first half of this article represents a scientific examination of available financial information to lay the foundation for the second part, based on the analysis of ESG scores provided by Romanian firms in the oil and gas industry. The research methodology in this article is based on the analysis of ESG scores published by Romanian companies. The relationship between ESG scores and business performance was investigated using facts obtained through the manual collection of data from the two distinct databases, Refinitiv and BVB.

As a result, in the following paragraphs, we will provide a concise explanation of what each platform entails and how the findings on ESG ratings generated by them might be interpreted.

The Refinitiv ESG scoring system follows several essential calculation criteria, including an aggregate ESG score, which takes away points from the ESG score for news disputes that significantly influence firms.

The Bucharest Stock Exchange (BVB) has introduced the first ESG project on the local capital market to provide listed companies with high-quality ESG information. Sustainalytics' ESG risk evaluations are created to assist investors in identifying and comprehending the material risks of the companies they hold and how these risks can impact the company's performance (Saam, 2015). There are five distinct risk ratings: negligible, low, medium, high, and severe. The Bucharest Stock Exchange is contemplating the development of the ESG infrastructure in Romania, beginning with this stage, by engaging as many local participants as possible, publishing presentation materials and guides for issuers, and launching new products. Investors take ESG standards into account during the investment process.

Corporate ESG activities for environmentally friendly management have become crucial for ensuring competitiveness in a global business environment. Nevertheless, many still disagree about whether ESG activities can enhance a company's financial performance (Duque-Grisales & Aguilera-Caracuel, 2021).

Recently, issues related to the environment that has been created by corporations, such as emissions of greenhouse gases, deterioration in water quality, and air pollution, have attracted attention on a worldwide scale, and a few governments have established regulations to address these concerns (Ben-Amar et al., 2017). Reporting non-financial information is based on corporate social responsibility activities, also known as CSR (Corporate Social Responsibility) attitudes. Through these activities, a company seeks to contribute positively to the environment to which it belongs instead of negatively. CSR is a business model that encourages companies to consider themselves, their stakeholders, and society. Companies that practice CSR are cognizant of their impact on the economic, social, and environmental environment (Panait et al., 2022).

The primary subject matter of Directive EU/95/2014 is companies and large groups for which small and medium-sized businesses wish to reduce the regulatory burden. Investors and consumers are the primary entities, with the remainder generally classified as "other stakeholders" (European Parliament, 2014).

Table 1 is presented a summary of the potential statement content, broken down by its significant aspects.

Table 1. Principal ESG activities

Environmental	Social	Governance
"Preservation of our natural world • Climate change • Carbon emission reduction • Water pollution and water scarcity • Air pollution • Deforestation • Greenhouse gas emissions • Resource use • Emissions • Innovation"	"Consideration of humans and our interdependencies • Customer Success • Data hygiene and security • Gender and diversity inclusion • Community relations • Mental health • Workforce • Human rights • Community • Product responsibility"	"Logistics and defined process for running a business or organization • Board of Directors and its makeup • Executive compensation guidelines • Political contributions and lobbying • Venture partner compensation • Hiring and onboarding best practices • Management • Shareholders • CSR strategy"

Source: own representation based on annual financial reports published by Refinitiv, 2023

The case study analyzed a sample of 8 companies listed on the Bucharest Stock Exchange in the field of energy and oil: Omv Petrom S.A., N.G.N. Romgaz S.A., S.N. Nuclear Electrica S.A., S.N.T.G.N. Transgaz S.A., Energetica Electrica S.A., C.N.T.E.E. Transelectrica S.A., Conpet S.A. and Rompetrol Well Services S.A.

The selected sample was analyzed using primary and non-financial indicators. In terms of financial indicators, the analysis period 2019–2021 was selected to observe the development of each company individually.

2.3. Results

Compared to countries within the EU, only a small percentage of Romanian businesses have provided sustainability reports that follow comparisons to countries within the EU, and a relatively small number of Romanian businesses have provided sustainability reports that meet GRI standards.

The Administration of Alterations to Worldwide Energy Systems The energy landscape of the future will be shaped by regional and international factors, which will impact regional and international factors and how we provide power to our cities, run our transportation systems, and maintain our manufacturing base.

The progress towards electrification is accelerating, there is a strong demand for alternative sources of energy, the proportion of energy production that comes from renewable sources is growing, and these sources are frequently a competitive alternative to fossil fuels.

The oil and gas industry will continue to depend on a variety of significant market variables as well as the evolution of those market forces themselves.

Table 2 presents the financial indicators of companies included in a sample for 2019-2021. The data were manually collected from BVB.

The efficiency of management can be measured, in part, by looking at metrics like return on equity (ROE) and return on assets (ROA). (Ruan, 2021). The main distinction between ROE and ROA is financial leverage or debt. A company's shareholder equity and total assets would be equal without financial leverage. However, with financial leverage, the return on equity (ROE) would be greater than the return on assets (ROA). When calculating return on assets, the denominator is increased when a company increases its asset base through debt because of the influx of cash. As a result, ROA will decrease while ROE will remain unchanged.

Table 2. Financial Indicators

Year	Financial Indicators	OMV PETROM S.A.	S.N.G.N. ROMGAZ S.A.	S.N. NUCLEAR ELECTRICA S.A.	S.N.T.G.N. TRANS- GAZ S.A.	ENER- GETICA ELECTRICA S.A.	C.N.T.E.E. TRAN- SELEC- TRICA S.A	CONPET S.A	ROMPET- ROL WELL SERVICES S.A.
2021	Return on Assets (ROA)	5.73%	16.96%	10.76%	2.21%	-7.01%	0.02%	6.73%	1.06%
	Return on Equity (ROE)	8.37%	21.32%	12.39%	4.46%	-11.16%	0.04%	7.77%	1.17%
	Gross Profit Margin	43.59%	95.08%	86.05%	90.88%	20.67%	18.16%	68.08%	46.19%
2020	Return on Assets (ROA)	2.71%	13.47%	7.91%	2.29%	4.81%	2.73%	8.01%	2.87%
	Return on Equity (ROE)	3.90%	16.02%	9.30%	4.41%	6.73%	4.14%	9.26%	3.16%
	Gross Profit Margin	40.67%	97.72%	91.07%	90.86%	39.92%	39.90%	69.02%	49.27%
2019	Return on Assets (ROA)	7.65%	13.20%	6.08%	5.89%	2.64%	1.86%	7.68%	7.41%
	Return on Equity (ROE)	10.85%	15.19%	7.30%	9.04%	3.70%	2.67%	9.01%	8.18%
	Gross Profit Margin	44.48%	97.96%	90.80%	93.47%	38.54%	31.61%	68.66%	51.14%

Source: own representation based on annual financial reports published by the companies on the Bucharest Stock Exchange site in 2019-2021

Following the financial indicators discussed earlier, we will now provide in Table 3 the score given to each of the eight organizations chosen for the sample. In the course of the investigation, we came across a significant barrier in terms of measuring and establishing the ESG score due to the absence of data. As a

consequence of this, in order to calculate the score, it was essential to use three different databases. Only the three companies, OMV Petrom SA, Nuclearelectrica SA, and Conpet SA, have their scores in the first column, which displays the score determined by the Refinitiv platform. Even though our initial sample was for 2019–2021, because there was a lack of published data, it was necessary to restrict the reference period. To be more specific, for OMV Petrom, we have data for the years 2020 and 2021, but for the other two companies, Nuclearelectrica SA and Conpet SA, we do not have data until 2021.

We note that Transelectrica and Romgaz do not own a score that has been computed and made public by the two databases that have been selected.

Table 3. ESG Score

| No. | Source | ESG Refinitiv | ESG BVB | |
	Company	ESG Score	ESG Risk Score	Compared ESG Risk Score
1	OMV PETROM	74	22.5	NO
2	NUCLEAR ELECTRICA	41	23	+3,6
3	CONPET	24	NO	NO
4	ROMPETROL WELL SERV	NO	19.2	-22,6
5	TRANSGAZ	NO	27.30	-11,7
6	ENERGETICA ELECTRICA	NO	29.9	-3
7	TRANSELECTRICA	NO	NO	NO
8	ROMGAZ	NO	NO	NO

Source: own representation based on annual financial reports published by the companies on the Bucharest Stock Exchange site in 2019-2021

ESG Scores that Refinitiv supplies aim to quantify the relative performance of a firm in ten different areas related to ESG by using transparent and objective data (Chodnicka-Jaworska, 2021).

OMV Petrom SA is a petroleum and natural gas company headquartered in Romania. For the financial year ending in December 2021, the company was given an ESG score of 74.14, which corresponds to a grade of B+. The company has received an ESG score of 74.14 on average over the past five years, and it has received a score of 72.96 in the median. The Refinitiv ESG score is calculated by adding up the scores of each pillar based on their respective weights. The ESG score weightings are 34.51%, 41.96%, and 23.53%. This is consistent with the weightings used by other companies in the oil and gas industry. The total num-

ber of controversies gathered by the Refinitiv ESG team and then normalised based on the company's market capitalization was used to determine a controversy score of 100.00, corresponding to an A+ grade.

Despite the controversy surrounding the company throughout the year, it was given a combined ESG score of 74.14, which corresponds to a grade of B+. As a direct result of adjustments made in ten ESG categories, the overall ESG score increased slightly, going from 71.77 to 74.14. Relative declines in the workforce, resource use, and human rights categories were partially offset by relative improvements in the categories of management, shareholders, and community (see Year-Over-Year ESG Performance: Attribution for details).

The primary drivers of category and summary score changes at the metric level are shifts in 104 out of 149 different metric scores. Changes in relative ranking against peers were responsible for 70 of the 104 identified metric changes. In contrast, changes in underlying reported metric values were responsible for the remainder of the identified metric changes (see the Year-Over-Year ESG Performance: Material Factor section for details).

Changes in ESG scores are primarily driven by two factors: shifts in the values of the underlying metrics that companies report and/or the relative ranking of the company in comparison to its competitors (Table 4).

Table 4 Historic performance summary- OMV Petrom SA

	FY2021	FY2020	FY2019
Period End Date	2021-12-31	2020-12-31	--
Historical Market Cap(Mil USD)	$5,948	$4,733	$5,429
Total Revenue (MilUSD)	$5,982	$4,954	$5,972
ESG Combined Score	B+	B+	--
ESG Score	B+	B+	--
Environmental PillarScore	B+	B+	--
Social Pillar Score	A-	A-	--
Governance PillarScore	B+	B-	--
ESG ControversiesScore	A+	A+	--

Source: own representation based on Refinitiv, 2023

It has received an average ESG score of 72.96 over the last two reporting periods. This score has ranged from a high of 74.14 (FY2021) to a low of 71.77 (FY2020). The Social pillar performed the best over the past two years, receiv-

ing an average score of 80.63. This was followed by the Environmental pillar, which received an average score of 72.41, and the Governance pillar (An average score: 60.09). Emissions, CSR Strategy, and Community are the three categories that have performed the best overall and by category over the past two years. On the other hand, environment, innovation, shareholders, and Management are the three categories that have performed the worst overall and by category over the same time frame.

National Nuclear Electrica SA is based in Romania. For the financial year ending in December 2021, I was given an ESG score of 40.85, corresponding to a grade of C. The company has a median ESG score of 40.85, the same as its average ESG score over the past five years, which is also 40.85. The total number of points each pillar earns is added to form the Refinitiv ESG score.

The ESG pillars of ESG scores are weighted at 42.50 percent, 32.50 percent, and 25.00 percent, respectively, and are weighted at 42.50 percent, 32.50 percent, and 25.00 percent, which is consistent with the weightings given to companies in the Electric Utilities & IPPs industry group.

The total number of controversies compiled by Refinitiv ESG team and then normalized based on the company's market capitalization were compiled by the Refinitiv ESG team and then normalized based on the market capitalization of the company were used to determine the controversy score, which was calculated to be 100.00 (Grade: A+). As a reflection of the controversy surrounding the company throughout the year, the company received an ESG Combined score of 40.85, corresponding to a grade of C (Table 5).

Table 5. Historic performance summary- Societatea Nationala Nuclearelectrica SA

	FY2021	FY2020	FY2019
Period End Date	2021-12-31	--	--
Historical Market Cap (Mil USD)	$3,261	$1,354	$1,008
Total Revenue (Mil USD)	$717	$615	$557
ESG Combined Score	C	--	--
ESG Score	C	--	--
Environmental Pillar Score	C-	--	--
Social Pillar Score	B-	--	--
Governance Pillar Score	C+	--	--
ESG Controversies Score	A+	--	--

Source: Refinitiv,2023

Based on the most recent reporting period, it has received an average ESG score of 40.85. This score has ranged from a high of 40.85 (FY2021) to a low of 40.85 (FY2021). The Environmental pillar had the best performance over the past year, with an average score of 43.44, followed by the Governance pillar, which had an average score of 43.21, and then the Social pillar, which had an average score of 54.21. (Average score: 29.10) Community, Resource Use, and Workforce are the three categories that have performed the best over the previous year. On the other hand, Environmental Innovation, Emissions, and Product Responsibility are the three categories that have performed the worst.

Conpet SA is a supplier of oil and gas-related equipment and services with its headquarters in Romania. For the financial year ending in December 2021, the company received an ESG score of 24.21, corresponding to a grade of D+. In the past five years, the company has earned an ESG score of 24.21 on average, and it has also earned a score of 24.21 on the median level. The sum of the scores obtained for each pillar constitutes the Refinitiv ESG score.

The environmental, social, and governance pillars are weighted at 32.51%, 39.63%, and 27.86%, respectively, in the ESG score weight, in line with oil and gas companies. The Controversy Score is calculated based on the total number of company-related controversies collected by Refinitiv ESG and normalized by the companies' market capitalization and is 100.00 (Grade: A+). Diminished by its controversies, the company received a combined ESG score of 24.21 (Grade: D+).

The controversies surrounding it are reflected in its ESG Combined score of 24.21, which received a grade of D+ for the year.

The Environmental, Social, and Governance (ESG) score was 24.21 last year, and it dropped to 24.21 this year due to changes in 10 of the 10 ESG categories. At the metric level, the changes in 97 out of 131 metric scores are the primary determinants of category and summary score changes.

Changes in relative ranking against peers accounted for five of the 97 identified metric changes. In contrast, changes in fundamental reported metric values accounted for the remainder of the identified metric changes (see the Year-Over-Year ESG Performance: Material Factor section for details). The changes in ESG scores are primarily determined by two factors: shifts in the values of the underlying company-reported metrics and/or the company's relative ranking in relation to its competitors (Table 6).

Table 6. Historic performance summary- Conpet S.A

	FY2021	FY2020	FY2019
Period End Date	2021-12-31	--	--
Historical Market Cap (Mil USD)	$157	$166	$161
Total Revenue (Mil USD)	$104	$112	$104
ESG Combined Score	D+	--	--
ESG Score	D+	--	--
Environmental Pillar Score	D+	--	--
Social Pillar Score	C-	--	--
Governance Pillar Score	D+	--	--
ESG Controversies Score	A+	--	--

Source: Refinitiv, 2023

Based on the most recent reporting period, it received an average ESG score of 24.21. This score has ranged from a high of 24.21 (FY2021) to a low of 24.21 (FY2021). The Social pillar performed the best over the past year, receiving an average score of 26.38; this was followed by the Environmental pillar, which received an average score of 23.75, and the Governance pillar (Average score: 21.67). In comparison, CSR Strategy, Product Responsibility, and Environmental Innovation are the three categories that have performed the worst over the past year. The three categories that have performed the best are Resource Use, Human Rights, and Workforce.

The evaluation continues with the scores established by BVB, which may be found in the second column of Table 3 ESG Score. The ESG Risk Score represents the amount of risk that the firm cannot handle at the present time. In this respect, a lower score is desirable, as this would show that there are a few problematic areas for which the organization does not have control mechanisms installed. In other words, a lower score indicates a higher level of risk management. We can see that according to the score, Energetica Electrica has the most significant risks that are not under control, with a score of 29.9, while OMV Petrom S.A. has the fewest risks that are not under control. The ESG Raking Score indicates the company's position concerning other businesses operating in the same sector. Exposure analyzes and assesses the company's susceptibility to various critical ESG hazards. This analysis and evaluation consider internal and external factors of the o organization, such as the company's business plan.

The correlation between financial performance and ESG indicators could not be established statistically; it could only be established by analyzing the data presented in Table 2. Financial Indicators and Table 3. ESG Score.

Therefore, based on analysis of each company for which there are published data, it found that in the past two years, the financial performance of Transgaz company has remained relatively stable, while ESG indicators have improved. Due to losses incurred, the financial situation of Energetica Electrica has deteriorated, while ESG indicators have improved at a relatively slow rate. In the case of Rompetrol Well Services, financial performance is declining slightly, whereas the evolution of ESG parameters has markedly improved. The financial performance of OMV has improved, while ESG indicators have remained unchanged.

A higher score indicates greater vulnerability to significant environmental, social, and governance risk factors. The exposure should be as low as possible; however, since both external factors to the company (risks to the sub-industry) and internal factors (the business model) are taken into consideration, we are unable to use this indicator as a comparison factor outside of the context of analyzing businesses operating in the same industry. The management indicator evaluates the degree to which the organization has risk management policies, practices, and programs, which of them are used by management, and the management's general attitude towards the ESG risks that have been identified.

The indicator known as momentum reflects the evolution of the ESG Risk Rating compared to the previous period. A negative score indicates that there has been an improvement in managing uncontrolled ESG risks.

Analyzing the non-financial performance of OMV Petrom from the strict point of view of the score without considering its position within the sub-industry to which it belongs, we would probably be inclined to assume that OMV Petrom's performance is ordinary. However, if we consider its position within the sub-industry it belongs to, we will probably come to the opposite conclusion. OMV Petrom S.A. has the highest degree of exposure out of all the companies that were evaluated; however, because it also has the highest management score, we can say that this high degree is primarily attributable to the risks of the sub-industry, also known as the inherent risk of the business, and is in no way attributable to poor management. This is the result even though OMV Petrom S.A. has the highest management score. According to the results of the Momentum indicator, we can notice that the ESG's overall performance has improved compared to the previous quarter's performance.

3. CONCLUSION

The relationship between ESG factors and the non-financial performance of energy and oil companies can be significant. It can affect these companies' reputation, sustainability, and long-term performance (Pirtea et al., 2021).

The analysis includes eight energy and petroleum-related companies listed on the Bucharest Stock Exchange. Following the completion of this case study, it is found that these companies may significantly impact the environment due to greenhouse gas emissions, air and water pollution, deforestation, etc. Thus, companies that adopt environmental impact management practices, emissions reduction, and conservation of natural resources can benefit from better non-financial performance over time. In addition, developing and adopting renewable energy sources or other green technologies can help increase sustainability and attract investors interested in ESG criteria.

Social aspects are also crucial for evaluating the non-financial performance of energy and oil companies. These issues may include employee safety and health, relations with local communities, respect for human rights and diversity, and inclusion within the organization (Chang & Lee, 2022). Companies that invest in community development programs, adhere to work ethics standards, and promote diversity and inclusion can gain a positive image and build trusting relationships with various stakeholders, leading to long-term benefits.

Corporate governance is another crucial aspect of evaluating the non-financial performance of companies. Effective leadership and management, transparent and ethical practice, and accountability to shareholders and other stakeholders can influence the company's reputation and trust. Energy and oil companies that adopt high governance standards and ensure a responsible approach to their decisions and operations can attract investors, customers, and long-term business partners.

It is also essential to observe that ESG factors can impact the financial performance of businesses. Adopting sustainable practices, for instance, can reduce operating costs and environmental hazards and attract investment and conscientious customers (Chodnicka-Jaworska, 2022). However, the relationship between environmental, social, and governance (ESG) factors and financial performance can vary depending on the specific context of each company and its operating market.

Even though this study has academic and practical implications, there are certain limits to the research on the sample being analyzed that are desirable to be addressed in further research. Thus, the limitations of this case study are the unique qualities of the analyzed sample that cannot be generalized because there is no historical data for all companies in the sample. This analysis is carried out to ensure the transparency of the information provided by companies listed on BVB that are active in the energy and oil sectors. Researchers interested in non-financial and sustainability reporting and corporate leadership representatives may find this valuable material as a source for a bibliographic article or dissertation.

Therefore, the social and cultural characteristics of these organizations and the distinctive aspects of the energy and oil industries could have impacted the findings.

Further studies can address this constraint by examining the existing analytical model for its applicability in different nations, regions, and organizations operating in the oil and energy sectors. Second, there is the potential for excellent corporate performance to become a justification for improving sustainable management efforts.

Regarding future research directions, we must deepen the link between non-financial performance and sustainable management activities through more complex statistical analysis. To enhance the positive impact of these activities on the financial performance of businesses, the sample should be expanded to include data from other sectors in the country and extrapolated to include information from other European nations.

In conclusion, by considering ESG factors and promoting sustainable practices, energy and oil companies can improve non-financial performance by improving relationships with different stakeholders, reducing risks, and attracting responsible investors and customers.

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THE IMPACT OF DEMOGRAPHIC CHANGES ON THE ECONOMIC GROWTH: ANALYZING POPULATION SIZE, AGE STRUCTURE AND POLICY IMPLICATIONS

Ivan KRISTEK, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: ivan.kristek@efos.hr

Abstract

This study examines how demographic change affects the economy. The main research question is how population size and age structure changes affect economic growth and development. The study will use econometric methods to estimate a statistical relationship between demographic variables and economic outcomes. Potential methods include regression analysis, panel data analysis, and time series analysis. Data used in this study include demographic variables such as population size, age structure, and educational attainment. Economic outcomes of interest include GDP growth rate.

This study aims to provide insights into how demographic changes may affect economic growth and development. This information may be helpful to policymakers in designing effective policies to promote economic growth and ensure sustainable development. The study may also provide insights into potential challenges or opportunities arising from demographic change, such as an aging population or changes in the labor force. Overall, this study should contribute to a better understanding of the complex relationship between demographic changes and economic outcomes, aiming to promote inclusive and sustainable economic development.

Keywords: *Demographic changes, Economic growth, Development, Panel data analysis*

JEL classification: J11

1. INTRODUCTION

Demographic change, which includes shifts in population size and age structure, plays a central role in shaping economic growth and development. Extensive academic research has demonstrated the significant impact of demographic factors on various aspects of an economy's performance. Understanding the relationship between demographic changes and economic growth is crucial for policymakers who want to design effective strategies to promote sustainable development.

Numerous studies have documented the profound impact of population size on economic growth. For example, researchers found a positive relationship between population growth and economic performance, suggesting that a more significant labor force and consumer base can contribute to higher productivity and market expansion. Their study (Hondroyiannis & Papapetrou, 2002) concludes that an increase in real GDP per capita leads to higher fertility, implying a positive income effect. Conversely, studies by Lucas Jr. (1988) and Mankiw et al. (1992) have highlighted the potential challenges that arise when population growth exceeds resource expansion and emphasized the need for efficient resource allocation and productivity-enhancing measures.

Age structure, another crucial demographic factor, affects economic growth through its impact on labor force dynamics, saving and consumption patterns. Their research (Bloom et al., 2007) showed that changes in age distribution can significantly affect the productivity of an economy and the accumulation of human capital. They claim that per capita income tends to be higher when the share of working-age people in the population is high (Bloom et al., 2007). In addition, studies by Lee and Mason (2011) emphasize the impact of an aging population, such as changes in labor force participation rates and rising healthcare expenditure. This can pose a challenge to maintaining economic growth and ensuring intergenerational equity. His research (Mason, 1998) claims that lower fertility and slower population growth in several countries have contributed to the macroeconomic goal of higher savings. It is well known from economic theory that higher levels of population savings usually lead to higher levels of investment, which consequently has an impact on increasing the economy's productivity, which in turn has a direct impact on the growth of economic development.

Building on the existing literature, this paper aims to empirically analyze the impact of population size and age structure on economic growth. The relation-

ship between these demographic factors and economic outcomes will be quantified through robust econometric methods, including regression analysis and panel data techniques. In addition, other relevant variables, such as educational attainment, will be considered to capture the multidimensional nature of the relationship.

Through this comprehensive analysis, the research seeks to contribute to the body of knowledge on the impact of demographic change on economic growth and development. By identifying the key drivers and policy implications, the author aims to provide valuable insights to help policymakers formulate strategies to address the challenges and seize the opportunities that demographic change offers.

2. LITERATURE REVIEW

The impact of demographic change on economic growth has been the subject of extensive academic research. This literature offers valuable insights into the complex relationship between population dynamics and economic outcomes. Understanding how changes in population size and age structure affect economic growth is critical for policymakers and researchers seeking to design effective strategies for sustainable development.

Many analysts believe that economic growth in high-income countries will likely be relatively slow in the coming years, partly because population growth is expected to slow significantly (Baker et al., 2005). They agree, noting that slowing population growth in the United States is one of the reasons why future economic growth in the US will be lower than in most of the 20th century.

Studies that have examined the relationship between population size and economic growth have reached different conclusions. In their research, Headey and Hodge (2009), empirical analyses of the relationship between population growth and per capita income growth vary widely due to different methodologies, control variables and other factors. While some studies suggest a positive relationship, others have found mixed or inconclusive results. Some argue that population growth can contribute positively to economic performance. They assume that a larger population can lead to a more significant labor force, higher market demand and improved technological innovation, ultimately increasing productivity and economic growth. However, another group of researchers has

pointed to the potential challenges of rapid population growth, including strain on resources, infrastructure and environmental sustainability. These studies emphasize the importance of efficient resource allocation and productivity-enhancing policies to reap the potential benefits of population growth while mitigating its potential negative impacts. Some authors examined the impact of population growth rate on economic development but also included a country's level of economic development. In their research, Headey and Hodge (2009) found strong evidence to support the hypothesis that the impact of population growth on economic growth is more harmful in developing countries.

Another important demographic factor is age structure, which has received considerable attention in the literature. The proportion of working-age people in the population has been linked to economic growth. Some studies emphasize that changes in age distribution significantly affect economic growth by affecting labor force dynamics and human capital accumulation. They argue that a higher share of working-age individuals can contribute to higher productivity and economic output. Conversely, the challenges associated with population aging have been widely studied. In their research, Lee and Mason (2011) emphasize that total investment in human capital is constant across the demographic transition, so family size does not directly affect total generational human capital. This implies constant returns to scale for human capital investment. These studies highlight the need for policies that address the changing age structure, such as promoting labor force participation, increasing productivity, and addressing health and pension systems.

In addition to population size and age structure, the literature recognizes the importance of other demographic factors in economic outcomes. Educational attainment is an essential determinant of economic growth. Most empirical studies point to the positive relationship between educational attainment and productivity and emphasize the role of human capital in promoting economic growth. In addition, research has examined the interplay between demographic changes and technological progress. They suggest that demographic shifts, such as an increase in the working-age population, can create favorable conditions for technological progress and innovation, driving economic growth.

The methodological approaches used in researching the impact of demographic change on economic growth vary. Econometric methods such as regression analysis, panel data methods, time series analysis and instrumental

variables methods are commonly used. These approaches allow researchers to control for confounding factors, examine causal relationships and explore the dynamic interactions between demographic variables and economic outcomes.

While the existing literature provides valuable insights into the impact of demographic change on economic growth, it is essential to note that there is no consensus on the exact size or direction of these effects. Context-specific factors such as institutional quality, economic structure and policy frameworks can significantly influence the relationship between demography and economic growth. Moreover, heterogeneity across countries and regions requires careful consideration of local conditions when concluding.

The policy implications of demographic change for economic growth are apparent. Policymakers must develop strategies that harness the potential benefits of population dynamics while mitigating the associated challenges. Policies to address population growth can focus on improving human capital, promoting labor force participation and ensuring equal access to education and health care. In addition, policies tailored to the impact of aging could include measures to promote labor force participation of older people, support health systems and adapt social security and pension systems to changing demographics.

The scientific research conducted so far provides a nuanced understanding of the impact of demographic change on economic growth. While the relationship between population dynamics and economic outcomes remains complex and context-dependent, the literature underscores the importance of demographic factors in shaping economic development. Further exploration of these relationships and robust methodological approaches will further enrich our understanding of the mechanisms through which demographic changes influence economic growth. These insights will enable evidence-based policy decisions and contribute to sustainable development.

3. METHODOLOGY

This scientific work aims to investigate whether there is a connection between changes in the population structure and changes in the state's economic development. In order to achieve this goal, after a theoretical analysis of the research area, it seems appropriate to apply regression analysis in the empirical part of the work. Regression analysis consists of applying various methods to

study the dependence of one variable on another or several variables (which is the case in this research). It serves analytical and predictive purposes and is applied in almost all professional and scientific fields. The regression model that will examine the impact of demographic changes on economic development is structured as follows:

$$GDP_{it} = \beta_0 + \beta_1 PGR_{it} + \beta_2 FER_{it} + \beta_3 GTE_{it} + \beta_4 PPA1_{it} + \beta_5 PPA2_{it} + \beta_6 PPA3_{it} + \mu_{it}$$

where is:

GDP_{it} – GDP growth rate

$\beta_0 - \beta_6$ – regression coefficients that need to be calculated

PGR_{it} – population growth rate

FER_{it} – the total fertility rate

GTE_{it} – Graduates in Tertiary Education (STEM)

$PPA1_{it}$ – Proportion of the population aged 15 to 24 years

$PPA2_{it}$ - Proportion of the population aged 25 to 49 years

$PPA3_{it}$ - Proportion of the population aged 50 to 64 years

μ_{it} – Random error term

i – Cross-sectional units (27 countries of EU)

t -Time dimension (11 years; 2011 – 2021).

The study is based on secondary data publicly available on the Eurostat website (https://ec.europa.eu/eurostat/). The study included data on 27 European Union member states from 2011 to 2021. Economic development is defined by the annual GDP change variable rate and set as the dependent variable in the regression model. The independent variables that attempt to determine the impact on the dependent variable are demographic. The population growth rate (PGR) as the independent variable represents the annual percentage change in the total population. After reviewing previous studies, it can be assumed that this variable positively influences the country's economic development. Thus, based on current scientific knowledge, the author expects $\beta_1 > 0$. The fertility rate (FER) is the average number of children a woman will bear if she survives her reproductive years (for calculations for statistical purposes, reproductive

age usually starts at 15 and ends at 49) and if the birth rate by age does not change over time. One of the reasons for the popularity of this indicator is its ease of interpretation (at least in a general context) compared to other fertility measures. For example, someone interested in the fertility rate in an area can interpret that a FER with an average value of 2 (two children per female) means that, in this case, every parental couple has a replacement in the next generation. This variable provides information on whether the total population (in the next generation) will increase without external population migration. Looking at previous research, the author can assume that this variable positively impacts the economic development of the country. Therefore, based on current scientific knowledge, the author expects to be $\beta_2 > 0$. The independent variable, graduates in tertiary education (GTE), shows the number of persons per thousand inhabitants who have completed higher education in STEM. This sector of the economy, where these persons will enter the labor market, adds a net added value to the national economy. It can therefore be expected to have a positive impact on economic development. The author can expect the value of $\beta_3 > 0$. In the study, the proportions of the population by age that make up the working population are included as independent variables. The working population is divided into three groups: PPA1 for the age group from 15 to 24 years old, PPA2 for the age group from 25 to 49 years old and PPA3 for the age group from 50 to 64 years old. Since it is the working population, i.e., the population that directly influences a country's economic development, the regression coefficients ($\beta4$, $\beta5$ and $\beta6$) are expected to be greater than 0 in this case.

After setting up the regression model, the author has to decide whether to use the fixed or random effects models. Which model is more appropriate depends on panel data properties. The fixed effects model describes each individual and is well suited when researchers need information about each individual because it is specific to itself. However, if each individual can be considered a randomly selected representative of the whole population and does not differ significantly from others in all its characteristics, then the random effects model would be more appropriate. From this, it can already be seen that the random effects model is better suited for this investigation. To test this assumption, the Hausman test was conducted in the study. This test is one of the most important instruments to determine which panel model is more suitable for this research, i.e., with which panel model this research will achieve a more efficient result. The null hypothesis of the Hausman test assumes no significant

difference in the estimated coefficients, i.e., the random effects model should be applied in this case. The Hausman test was calculated using the STATA 18 software package, and the results are shown below.

Figure 1. Hausman test

Source: Author's calculation using STATA 18 software

The result of the Hausman test for the panel data used in this study showed that the random effects model was a better fit. The previously defined regression model was calculated using the random effects model, and the results and analysis of the regression coefficients are presented in the following section.

4. RESEARCH RESULTS

The study is based on panel data for eleven years (2011 – 2021) for 27 European Union member states. In order to be able to analyze the available data more efficiently and more precisely, descriptive statistics of the secondary data are presented before the regression analysis with the random effects model.

Figure 2. Descriptive statistics of regression variables

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. xtsum GDP PGR FER GTE PPA1 PPA2 PPA3
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Variable		Mean	Std. dev.	Min	Max	Observations	
GDP	overall	2.075084	3.794669	-11.3	24.4	N =	297
	between		1.706844	-1.436364	7.236364	n =	27
	within		3.403619	-11.78855	19.23872	T =	11
PGR	overall	.337445	.7931514	-2.2	4	N =	297
	between		.6322753	-.5295584	2.088623	n =	27
	within		.4927706	-1.342088	2.248822	T =	11
FER	overall	1.537239	.1860792	1.13	2.03	N =	297
	between		.1685746	1.281818	1.925455	n =	27
	within		.0846648	1.285421	1.78633	T =	11
GTE	overall	17.67948	5.92362	3.4	40.3	N =	229
	between		5.598	3.911111	32.32222	n =	27
	within		2.117647	6.957254	29.20448	T-bar =	8.48148
PPA1	overall	11.33603	1.262511	8.8	16	N =	297
	between		1.002741	9.827273	13.94545	n =	27
	within		.7889322	9.181481	14.12694	T =	11
PPA2	overall	34.75993	2.134904	30.5	40.2	N =	297
	between		1.947517	31.44545	38.30909	n =	27
	within		.9450537	32.11448	38.7963	T =	11
PPA3	overall	19.94646	1.289823	16	23	N =	297
	between		1.113785	16.82727	21.96364	n =	27
	within		.6819361	17.64646	22.04646	T =	11

Source: Author's calculation using STATA 18 software

The dependent variable in this study is the average GDP growth rate. Its mean value for the eleven years is 2.07, while the range of movement of the variable is from -11.3 (in Spain in 2020) to 24.4 (in Ireland in 2015). The regression model consists of six independent variables. As an independent variable, the population growth rate (PGR) has a mean value of 0.33, with the lowest value being -2.2, recorded in Croatia in 2021, and the highest value, 4, in Malta in 2019. Data for the independent variable graduates in tertiary education (GTE) in the database are available from 2012 (for most EU member states).

For this reason, the number of observations is 229 (297 observations represent available data for all years for all 27 Member States). The mean value of this variable is 17.67, while the maximum value was recorded in 2021 in Ireland at 40.3. The analysis of this variable leads to an exciting conclusion. Of the first

ten places in the ranking, seven refer to Ireland in different years of observation, one place (the fifth in the ranking) refers to Slovenia (the year 2016; the value of the variable is 33.3), while the ninth and tenth places are reserved for France (2019 and 2020). The last three independent variables are closely related. They refer to the share of residents in the total population by age. The most represented variable is PPA2 (25 to 49 years), whose mean value is 34.75. The lowest value was recorded in France in 2021 and is 30.5, while the highest was in Malta in 2021 and is 40.5. It is also discouraging to note that the mean value of the variable PPA1 is 11.3, while the mean value of the variable PPA3 is almost 20. Thus, in all 27 member countries, there is a more significant proportion of the old population, which will have a negative impact on the economic development of the European Union and its members.

Using the regression model presented in the methodology section, regression coefficients were calculated to explain how a single independent variable affects the dependent variable. The results of the calculated coefficients are presented in the table.

Table 1. Value of regression coefficients

	β_0	β_1	β_2	β_3	β_4	β_5	β_6
Coefficient	-33.04	0.338	5.284	0.111	0.315	0.492	0.229
p-value	0.016	0.041	0.006	0.038	0.222	0.007	0.442

Source: Author's calculation using STATA 18 software

The results obtained are only partially in line with expectations. All the coefficients are positive, which means that they will have a positive impact on economic growth. The value of the five coefficients is between 0 and 1, which means that growth in the independent variable will lead to growth in the dependent variable, but to a lesser extent. On the other hand, the coefficient explaining the effect of the fertility rate on economic growth states that economic growth will increase by five if the fertility rate changes by one unit. The coefficients related to the share of inhabitants in the total population by age tell us that the variable PPA2 has the most significant impact on economic growth. The p-value for the coefficients explaining the variables PPA1 and PPA3 is more significant than 0.05, so it is impossible to consider the values obtained statistically significant. It is an indication that their values are also positive and relatively low. The coefficient value for the population aged 15 to 24 years is higher than that for the population aged 50 to 64 years. There is a tendency for the younger

population to have a more significant influence on economic development than the older population (this assertion was not statistically proven in the study). The variable graduates in tertiary education (GTE) in STEM has the weakest influence on economic development. The relationship between this variable and economic growth is statistically significant (p-value = 0.038). These data are surprising, especially considering that the value of this variable is highest in Ireland, which had the highest economic growth rates during the study period. The author has no explanation for this variable's result and desires to investigate this doubt in future work.

5. CONCLUSION

In this study, an analysis of the relationship between changes in the demographic structure and the country's economic development was conducted. Regression analysis was used to determine the influence of the independent variables on the dependent variable - the rate of annual GDP change. Data were collected from secondary sources, particularly Eurostat, from 2011 to 2021 for 27 member states of the European Union.

The analysis of the results shows a statistically significant relationship between the demographic variables and economic development. All regression coefficients are positive, indicating a positive influence of the independent variables on economic growth. However, the coefficients obtained are relatively low, implying that changes in the independent variables have a limited impact on economic growth.

As expected, the population growth rate (PGR) positively influences economic development. Each unit increase in the population growth rate leads to a minor increase in economic growth. On the other hand, fertility (FER) also positively impacts economic growth. A one-unit increase in fertility leads to a five-unit increase in economic growth. This information is not surprising if it is interpreted as follows. A one-unit increase in fertility means that we expect each woman to give birth to one more child. Such a situation would significantly impact total population growth, and this research has already confirmed that population growth positively impacts economic growth.

It is important to note that the proportions of residents by age are also significant. The variable PPA2, which refers to the proportion of the working

population aged 25 to 49, has the most significant impact on economic growth. This indicates that the working population is a critical factor in economic development. However, the PPA1 and PPA3 refer to the younger and older working population but are not statistically significant.

From the results, the author can conclude that demographic changes impact the economic development of countries. An increase in the population growth rate and fertility rate, as well as a higher proportion of the working population at a certain age (middle age), can boost economic growth. However, it is necessary to consider other factors that influence economic development, such as political, social and economic factors, which were not the subject of this research. Future research should compare demographic, social, and political factors and determine their impact on economic growth.

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THE RIGHT TO EFFECTIVE STATE ADMINISTRATION THROUGH THE PRISM OF THE DOCTRINE OF PUBLIC MANAGEMENT

Vesna ŠKARE OŽBOLT, Ph.D.
Attorney at Law

E-mail: vesna.skareozbolt@gmail.com

Marina ZAGOREC, Ph.D.
City of Zagreb

E-mail: marina.zagorec@zagreb.hr

Abstract

Over the past few years, state administration reform in Croatia has been taking place increasingly. However, the mentioned results are insufficient to make the state administration more transparent, better, and more entrepreneurial. Citizens' perception of inefficient state administration still exists, primarily due to organization, motivation, implementation, responsibility, and efficiency. The goal of the paper is to show the realization of the vision of a modern state administration that will contribute to the economic development of Croatian society by providing public services in a predictable, professional, transparent, and convenient way. Based on the theoretical framework, this paper will also point out the practical problems and administrative procedures. The principle of good and efficient state administration includes clear decision-making procedures at the level of state bodies, transparent and accountable institutions, the primacy of rights in the management and distribution of resources, and capacity building to implement measures necessary in the fight against corruption. Based on the theoretical framework, this paper will also point out the practical problems in the work of the state administration that have led to deficiencies in quality and effectiveness. It refers to questioning modern, good, and efficient state administration in the context of administrative procedures and the right to good administration. One of the significant practical problems is the behavior or lack of behavior of state administration bodies when deciding

on the rights and obligations of individuals in administrative procedures, which is somewhat neglected. The paper will analyze the European Court of Human Rights jurisprudence in applying the provisions of Article 6, Paragraph 1 of the European Convention for the Protection of Human Rights and Fundamental Freedoms. This indicates violations of the right to a reasonable length of administrative proceedings and the institute of the administration's silence, which acts on the responsibility of every employee, leader of state bodies, ministries, and administration as part of the executive branch of government. The concept of new public management implies changes that must be implemented in the work and organization of the state administration, which would achieve better efficiency and service provision to end users. This paper will investigate and analyze which public management tools could bring the state administration and its bodies to a state of efficiency, prosperity, and trust of citizens.

Keywords: *State administration, efficiency, the silence of administration, the principle of good administration, public management*

JEL Classification: *D73, H83*

1. INTRODUCTORY NOTES

One of the fundamental human rights proclaimed by numerous international and national legal documents of every country is the right to good state administration.[1] The principle of good administration requires the administration to be bound by the law in both material and formal terms while guaranteeing individuals certain procedural rights in resolving administrative matters that have a legal effect on their rights, obligations, or legal interests.[2] In order to real-

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[1] State administration is an integral part of the broader public administration concept, including state administration, local and regional self-government, and public services, whose common goal is to satisfy general interests and public needs. In the European Union, the concept of "good governance" was elaborated through the White Book of the European Union entitled "European Governance", published by the Commission of the European Communities in 2001. For more, see Commission of the European Communities: European Governance—a White Paper, COM (2001) 428 final, Brussels, 25 July 2001

[2] The principle of good administration has been present in the legal systems of some member states for a long time; at the supranational level since the 70s of the 20th centuries, it has been standardized by the Council of Europe on several occasions. Thus, according to Recommendation CM/Rec(2007)7 of the Committee of Ministers to member states on good administration, https://wcd.coe.int/wcd / ViewDoc.jsp?id=11-55877&Site=CM, good governance must be ensured by quality legislation, which must be appropriate, consistent, clear, understandable, and acceptable. This principle has also found its place in the legal acts of the European Union, where it has been gaining more and more importance lately.

ize this right within the national framework, it is necessary to establish specific standards and principles that will ensure that the state administration performs its tasks legally, efficiently, and transparently. Establishing a good state administration implies a responsible and transparent administration that thoroughly and uniformly applies laws and other regulations and responds promptly and efficiently to all the needs of citizens and other legal entities. Only such an administration will perform its task and exercise power most effectively, rationally, and economically while protecting and harmonizing the public interest with realizing citizens' and other legal entities' rights and interests.

Within the framework of the Council of Europe, the activities of the European Court of Human Rights[3] (hereinafter: the European Court), which directly rely on the provisions of the European Convention for the Protection of Human Rights and Fundamental Freedoms (hereinafter: Convention)[4] which represents the most influential international legal instrument for the protection of individual rights in the world.[5] The concept of good administration within the European Union is governed by numerous legal sources, among which the Charter of Fundamental Rights of the European Union[6] (hereinafter: the

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[3] European Court of Human Rights (ECHR) (fr. Cour européenne des Droits de l'Homme (CEDH)) is a judicial institution of the Council of Europe, founded in 1959. year for protecting rights and freedoms guaranteed by the European Convention on human rights (1950). The Court became a permanent institution for protecting human rights in Europe on November 1, 1998, when it entered into force. Protocol 11 of the European Convention on Human Rights. Before the introduction of this Protocol, the judicial function, in addition to the Court, was performed by the European Court human rights commission (1954). The Protocol abolished the Commission, but it continued to work until October 31, 1999, to complete ongoing procedures. In the first three years of the independent existence of the European Court of Human Rights, the number of disputes increased by about 130%. During In 1998, 5,979 cases were registered, and in 2001, 13,858

[4] European Convention on Human Rights - ECHRde l'homme - CEDH) is an international treaty on the protection of human rights and freedoms in Europe and as such is the oldest and most effective system for protection of human rights in the world. The full name of the European Convention for the Protection of Human Rights and Fundamental Freedoms (ETS No. 005) was signed in Rome on November 4, 1950, by 12 member countries of the newly founded Council of Europe and entered into force on September 3, 1953.

[5] Krapac et al. (2013). Judgments of the European Court of Human Rights against the Republic of Croatia in criminal cases, University of Zagreb Faculty of Law, see preface.

[6] The Charter of Fundamental Rights of the European Union was proclaimed in December 2000 at the summit in Nice and is now part II of the Treaty on establishing the European Constitution. The Charter, as a fundamental right of the Union, includes the right of citizens to rules on the work of the administration (Article 41) and the right to a citizen can complain to the European Ombudsman about improper work of institutions and bodies of the Union (Article 43). The Charter represents one of the most important documents that had an extraordinary impact on strengthening the protection of fundamental rights arising from constitutional and international traditions and obligations common to

Charter) plays the most significant role. In the provision of Article 41, the Charter proclaims that "everyone has the right to have the institutions, bodies, offices and agencies of the Union process their cases impartially, fairly and within a reasonable time".[7] So, it is about the right of every citizen to turn to the state administration body in case of any of his rights or interests. Without good state administration, no transparent and responsible government bodies and independent institutions exist. However, the question arises whether and to what extent the state administration bodies in the Republic of Croatia respect the rules proclaimed by international and European standards.[8] According to the authors, only compliance with these rules can lead to the efficiency of the work of the state administration. In this sense, changes are necessary within the complete public administration, which has been continuously pointed out for many years by experts who deal with the subject, as well as public opinion.[9] The inefficiency of public administration is regularly highlighted as one of the most

member states, from the European Convention for the Protection of Human Rights and Fundamental Freedoms, from social charters that are adopted by the Union and the Council of Europe, as well as from the practice of the Court of Justice of the European Union and the European Court of Human Rights. See the full text of the Charter at: https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:12016P/TXT&from=R (27.04.2023)

[7] Đerđa believes that one of the essential obligations of administrative bodies related to the realization of the rights of citizens, and which today is more and more attached to importance, certainly deciding within a reasonable time. See more in Đerđa, D. (2012) Rules of administrative procedure in European law, Proceedings of the Faculty of Law. University of Rijeka, 33(1), p. 136.

[8] According to the provisions of Article 2 of the Law on the Organization of State Administration, the bodies of state administration are ministries and state administrative organizations.

[9] The latest surveys of public opinion in Croatia indicate that fewer and fewer Croatian citizens have confidence in the intention or ability of any political option to deal with the numerous problems effectively. The average results achieved in this research indicate that the quality of management in state government bodies is far from satisfactory, with large disparities between different dimensions and individual institutions. That gives cause for serious concern, but also the necessity of systematic, targeted improvements. On average, all bodies achieved 49% of possible points in 8 researched dimensions, the level around which the average results of the Government (49%) and ministries move, for which, on average, are further behind Government offices (41%). Only the Croatian Parliament achieves a somewhat above-average result of 56% points. For more, see Miošić N., Bronić M. and Škrabalo M. (2013). Index of good governance in Croatia 2012, research results, Research team GONG a in cooperation with the Institute for Public Finance, Zagreb, p. 10.
http://www.gong.hr/media/uploads/20130508_gong_-_index_of_good_management.pdf (27.04.2023) In the article entitled "Why the Croatian state administration is ineffective", commentators on the new Government's reform moves in the area of the public sector they generally agree with public opinion as expressed in all previous surveys - there is still no sign of real changes. For more see: https://www.dw.com/hr/za%C5%A1to-je-hrvatska-dr%C5%BEavna-uprava-neu%C4%8Dinkovita/a-54294246 (13.04.2023) https://rdd.gov.hr/vijesti/gradjani-trojkom-ocijen-ili-kvalitetu-usluga-koje-pruza-javna-uprava/1550 (27.04.2023)

important reasons for the poor position of the Republic of Croatia on the global competitiveness scale.[10]

In this paper, the entire issue will focus on the reform of the state administration since the authors consider the state administration to be the fundamental apparatus of the state, which should be given priority in establishing the efficiency and effectiveness of its work and activities. Without the efficient work of the state administration, there is no efficient society and no efficient state. In addition to numerous problems burdening the state administration, the authors understand that the procedures conducted today in the Republic of Croatia before the state administration bodies take an extremely long time. Namely, these are violations detected by the European Court in the application of the provisions of Article 6, paragraph 1 of the Convention, which indicates that there are still violations of the right to a fair trial in the Republic of Croatia, which relate to the reasonable length of the administrative procedure, as well as cases in which the administration is silent.

Delays in the work of state administration bodies harm the rights of every citizen, lead to the accumulation of files, an increase in the number of employees in the state administration, insufficient and superficial knowledge of the subject and, consequently, to the adoption of low-quality solutions or cases in which the state administration bodies did not make a decision within the prescribed period on the occasion of the submitted request, i.e., when the authorities have not decided on the frog within the prescribed period. Such actions, or failure to act by state bodies, lead to a loss of citizens' trust in the institutions of state power.

The paper aims to show the realization of the vision of a modern state administration that will contribute to the economic development of Croatian society by providing public services in a predictable, professional, transparent and convenient way with the help of the doctrine of public management.

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[10] The European Court evaluates the reasonableness of the length of the procedure considering the facts and circumstances of the specific case, always starting from the following criteria: the complexity of the case, the behavior of the applicant, the behavior of the competent authorities, as well as the importance of what is being brought to the applicant to the question in dispute.

2. ON THE PROBLEM OF STATE ADMINISTRATION REFORM IN THE REPUBLIC OF CROATIA

With technological progress and the spread of liberalization in the last 30 years, citizens' expectations from the government and the administrative apparatus have grown significantly. The question of the Croatian public administration reform, and therefore of the state administration as a current topic, has been touched upon by numerous legal experts, scientists, and judicial practice.[11]

A significant contribution to this topic was made by our most prominent author Pusić through his numerous works in which he presented the diversity of the issues of the entire public administration.[12]

In the Republic of Croatia, there have been real problems within the public administration, as well as the state administration, for many years. Namely, as far back as 2006, the Round Table of the Croatian Academy of Sciences and Arts was dedicated to issues of Croatian state and public administration reforms, where Pusić stated that special attention should be paid to the issues of excessive politicization of state administration, the insufficient professional and advisory capacity of public administration, and the removal of principles nomenclature from the state administration system. Education is generally the most urgent element for encouraging development, and education for working in the state administration has a special place in this.[13]

According to Koprić, the critical problems of Croatian public administration have already been identified and can be systematized into four fundamental

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[11] The most significant contribution to the topic of state and public administration was made by the most prominent authors such as Pusić, Koprić, Đulabić, Šimac, Ljubanović, Đerđa and Šikić. Namely, according to Ljubanović, the state administration is amid considerable organizational, functional and personnel changes, whereby i t pays special attention to the strengthening of human resources, within which the training of civil servants occupies a special place. See: Ljubanović, D. (2006). Croatian state administration on the way to establishing a complete system of training civil servants, Croatian public administration, 6 (2), p. 5.

[12] Pusić, among other things, dedicated himself to examining the experiences of contemporary world administrative reforms, the goal of which was to adapt to the tasks that the world today sets before them. See: Pusić E. (1999). Modernization of public administration. Croatian public administration, 1(1), p. 1-42.

[13] Đulabić, V. (2006). Reform of Croatian state administration - round table, Croatian public administration, 6(1), p. 283.

groups of problems orientation, organization, motivation and implementation.[14] In the framework of this issue, it is unavoidable not to mention the principles for the internal organization of state administration bodies, which Koprić tried to present a new system that would be based on more flexible organizational solutions and on which a new regulation on the internal organization of state administration in Croatia should be built.[15]

The maturing awareness of the need for state administration reform is confirmed by the fact that in 2008, at the fifth international convention on the quality of public administration in the European Union, which was held in Paris under the motto "Citizens at the heart of public quality," citizens were put in the center of attention.[16] Jurinjak believes that citizen participation is one of the fundamental principles of the European management of public affairs, and changes in our country are moving in this direction in the development of modern state administration.[17]

Starčević et al. state that after more than two decades, the state administration is still burdened with structural problems and that politicization is a great enemy of professionalism because the admission and promotion of so-called "submissives" demotivate others. Officials lead to the belief that education, competencies and effort are inadequate criteria for employment or promotion. [18] According to them, four basic elements are essential for modern administration's functioning: high-quality personnel, retention in service, further training, and especially the professionalization and depoliticization of management positions.[19]

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[14] In the context of consideration of the state of Croatian public administration, Koprić states that there has been a long-standing debate about the state of Croatian public administration, the need and method of its reform, the sectors and issues in which the reform should be implemented, the desired effects and possible consequences, the actors of the reform, the causes of the delay with its beginning and other similar issues. For more see: Koprić I., Reform of public administration in Croatia: neither painful cuts nor gradual changes - a new administrative paradigm is necessary no. June 26, 2016, Political analyses: quarterly for Croatian and international politics, Vol. 7 No. 26, 2016. p. 5.

[15] Koprić I. (2009). Principles for the internal organization of state administration bodies. Croatian public administration, 9 (1), p. 45–49.

[16] Jurinjak J. (2009). Main results of implementation of the State Administration Reform Strategy Croatian public administration, 9 (1), p. 30.

[17] Ibid

[18] Starčević et a. (n/a), Modern Administration, Social and Technical Research, p.124. https://www.ceps.edu.ba/Files/DIT/Godina%206%20Broj%201/7.pdf?ver=1 (27.04.2023)

[19] Ibid

From our experts' perspective, the state administration is burdened by numerous and complex problems that require well-prepared solutions, firm and committed reform leadership, and professional monitoring of the implementation of the state administration reform. The Report on the work of the Ombudsman for 2021 supports all this.[20] According to a survey by the Ombudsman, only 33% of Croatian citizens trust the public administration. When viewed at the EU level, trust is expressed by an average of 52% of citizens, while the provision of public services is assessed as poor by a high 61% of Croatian citizens.[21] The Report points to numerous problems cited by citizens, including the impossibility of getting in touch with the authorities, slowness in dealing with and failure to respond to submissions, unethical behavior of officials and irregularities in the procedures they carry out, and a formalistic approach.

In many cases, citizens complain about the administration's silence and the length of procedures when public law bodies must decide on their rights, obligations or legal interests in administrative proceedings.[22] To solve a wide range of problems within the state administration, the Republic of Croatia has been struggling for years to ensure timely, reliable and high-quality service to citizens, and in this effort, in recent years, it has adopted certain documents that set long-term goals and guidelines for the modernization of state administration in the Republic of Croatia. One of the first such documents was the State Administration Reform Strategy for the period 2008-2011, which was adopted by the Government of the Republic on March 19, 2008, and which established the prerequisites for realizing the vision of modern public administration, which

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[20] Report on the work of the Ombudsman for 2021, (Right to good governance), Zagreb, March 2022. For more see: https://www.ombudsman.hr/hr/pravo-na-dobro-upravajen/ (27.04.2023)

[21] Ibid

[22] Inefficiency and slowness in solving individual cases can seriously threaten the rights of citizens, so, for example, one complainant stated that she ended up homeless because it took CES six months to issue a decision on exercising the right to unemployment benefits. Citizens also point to corruption, and the media have reported numerous corruption and personnel affairs throughout the year, and corruption is also highlighted by the European Commission in its regular report on the rule of law, chapter on the Republic of Croatia. The fight against corruption is key to building a modern, efficient and transparent public administration in which citizens trust. According to the Corruption Perceptions Index for 2021, published by Transparency International, the Republic of Croatia is still perceived as one of the most corrupt countries in the European Union. Also, in the report from the end of 2021 regarding the implementation of the recommendations for the Republic of Croatia from the fifth evaluation round related to preventing corruption and promoting integrity in the central executive and law enforcement bodies, GRECO concludes how The Republic of Croatia has not satisfactorily implemented or resolved the issues from any of the seventeen recommendations.

included some interdependent goals with an emphasis on increasing efficiency and economy in the state administration system; raising the level of quality of administrative services; realization of openness and accessibility of state administration bodies; strengthening of the rule of law standards; strengthening of social sensitivity in state administration and relation to citizens; raising the ethical level in the civil service and reducing corruption; the application of modern information and communication technology and the inclusion of the Croatian state administration in the European administrative area.[23]

The Strategy is based on the basic idea that the activities of the state administration must be directed toward the citizens as much as possible and that the state administration must adopt the principles of good governance.[24]

The following document was the Public Administration Development Strategy from 2015 to 2020, which the Croatian Parliament adopted at its session on June 12, 2015.[25]

According to the Strategy mentioned above, modern state administration in the context of public administration must reflect the harmonization of the Croatian legal system with the European one and the acceptance of European administrative standards. The focus of that document was state administration as an indispensable and essential segment of the reform of the entire public administration reform, whose primary purpose is to provide fast and reliable public services. Public administration reform in the Republic of Croatia had to enable the effective implementation of laws and create a transparent, user-oriented, rational, professional, effective and efficient state administration. Such state administration should be an integral part of an effective business environment, a lever of social and economic development and a stronghold of the democratic process. The Strategy aimed to harmonize the development of public administration with the goals of Europe 2020, the European Union Strategy

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[23] State administration reform strategy for the period 2008-2011. Croatian public administration, 8 (2), p. 315-342. Complete see the text of the Strategy at: https://www.iusinfo.hr/Appendix/DDO-KU_HR/DDHR20100315N7_76_1.pdf (27.04.2023)

[24] Jurinjak, rep. cit. (note 19), p. 30.

[25] It is a comprehensive document that represents a framework for the development of public administration and is aimed at improving administrative capacities and better organization of public administration (Official Gazette No. 70/15).

that wanted to support the development of a competent, sustainable and inclusive economy until 2020.[26]

The Strategy was followed by adopting the National Plan for the Development of Public Administration from 2022 to 2027.[27] The aforementioned strategic document should enable the further transformation of Croatian public administration into a modern, highly professionalized, efficient and transparent public administration, adapted to the needs of society and citizens, with a more robust application of the principles of good governance in all public administration bodies. One of the biggest challenges for public administration continues to be finding and retaining highly competent and motivated officials. Each official's knowledge, skills and motivation significantly impact the productivity and quality of public administration and, thus, the quality of public services. The National Development Strategy of the Republic of Croatia until 2030 aims, in the next ten years, to build a functional and open public administration that will provide adequate responses to society's needs at all levels and contribute to the quality of life of citizens and the country's economic progress.[28]

For this reason, the depoliticization of public administration, employment and promotion based on professional results and equal treatment are the basic principles that will guide the improvement of the work of all parts of the state and public administration. The salary system in public administration will be adapted to these principles, along with the promotion of education and training, which will improve the skills of state and public servants to provide public services aimed at citizens and entrepreneurs. To increase citizens' legal security, some special efforts will be made to improve the quality of communication

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[26] The development of public administration will take place in three main directions: simplification and modernization of administrative procedures, as well as ensuring reliable and fast support of public administration to citizens and business entities through the implementation of e-administration projects, improvement of the human resources development and management system in order to create a modern public service, administrative reform system in accordance with the best practices and experiences of good management according to European standards. See: https://mpu.gov.hr/strategija-razvoja-javne-uprave-za-razdoblje-od-2015-do-2020-godine/22207(27.04.2023)

[27] At the session held on March 23, 2022, the Government of the Republic of Croatia adopted the National Public Administration Development Plan for the period from 2022 to 2027 and the Action Plan for the implementation of the National Public Administration Development Plan for the period from 2022 to 2024 (Official Gazette, No. 38/22). See: https://mpu.gov.hr/UserDocsImages/dokumenti/Strategije,%20planovi,%20izvje%C5%A1%C4%87a/Nacionalni%20plan%20razvoja%20public%20administration%20for%20the%20period%20of%202022_2027.pdf (27.04.2023.)

[28] See: https://narodne-novine nn.hr/clanci/sluzbeni/2021_02_13_230.html (27.04.2023)

between public institutions and citizens. Exceptional standards and guidelines will be developed to improve and simplify written and online communication between state and public administration bodies, to make this communication as accessible and understandable as possible to the broadest public. Investments will be made in human resources and expanding opportunities for the education and training of state and public servants to enable permanent alignment of their knowledge and skills with rapid environmental changes.

Despite all the documents and legal solutions adopted so far, the research from 2013 related to the reform of the state administration showed that in the description of the state administration, the most significant number of respondents (80%) believe that no significant progress has been made in strengthening professional integrity and dismantling client networks in the state administration. The same percentage of opinion is that the system is also cost-effective, and 77% of them do not think that the state administration managed to direct its actions to the needs of citizens and social problems. Finally, 73% believe that the system of individual responsibility for work results has not taken root both at the level of officials and at the level of officials.[29]

Respecting the presented views of eminent experts, the authors singled out only the most current problems, for which most of them agree that the critical problems of state administration are politicization, insufficiently skilled and professional staff, inaccessible communication with citizens, unequal treatment in employment, corruption, and the length of time to solve administrative problems—procedures, which would be tried to be solved with the help of the doctrine of public management.

3. EFFECTIVE STATE ADMINISTRATION

The basic tendency of state administration is to be efficient, reliable, open and transparent because no legal state can function without quality administration. As mentioned earlier, the Charter established the right to good administration.[30]

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[29] Miošić, N. and Škrabalo, M. (2013). Presumptions of successful implementation of state administration reform in the Republic of Croatia, Zagreb, Gong research center.

[30] See: https://eur-lex.europa.eu/legal-content/HR/TXT/PDF/?uri=CELEX:12016P/TXT/ (27.04.2023) The term good administration defined in this way should to be distinguished from the concept of good governance, which refers to the functioning of institutions and the strengthening of

Its provisions on impartiality, correctness and resolution of cases within a reasonable time should also be applied in administrative proceedings.[31] Discussing "good governance" as a doctrine in the European Union, Lozina and Klarić expressed that good governance is considered a transparent and responsible way of managing human, natural and financial resources for sustainable and balanced development[32]. It includes clear decision-making procedures at the level of public bodies, transparent and accountable institutions, the priority of rights in the management and distribution of resources, and capacity building for the elaboration and implementation of measures necessary in the fight against corruption.[33]

3.1. The right to efficient state administration according to European standards

Since the issue of this paper is specifically focused on the topic of state administration and achieving its effectiveness through the prism of the doctrine of public management, this chapter will refer only to relevant documents related to the actions of state administration bodies, structures two groups of documents concerning the bearer's documents adopted by the Council of Europe and those adopted by the European Union.

3.1.1. European Convention for the Protection of Human Rights and Fundamental Freedoms

The affirmation of the principles of good administration within the Council of Europe began with the Convention and was additionally shaped through the practice of the European Court. General procedural guarantees of a fair trial are

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the democratic legitimacy of modern states, and is propagated in OECD and EU documents. Good governance refers to the process of making decisions and their application and is based on the idea that public governance, together with economic development and social cohesion, a condition for permanent social progress, and includes the rule of law, transparency, responsiveness of institutions and orientation to users, participation of citizens with fairness in treatment of citizens and inclusiveness as well as responsibility, efficiency and effectiveness in performing public affairs.

[31] Koprić, I. (2009). New Law on General Administrative Procedure, Modernization of General Administrative Procedure and Public Administration in the Republic of Croatia, Institute for public administration, University of Social Sciences, Zagreb, Croatia, p. 34-36.

[32] Lozina, D. & Klarić, I. (2012)."Good governance" as a doctrine in the European Union, 28 (2), p. 27.

[33] Ibid

applied in all procedures in which the applicant's "civil rights and obligations" are decided. Omejec points out that the term "rights and obligations of a civil nature" should not be interpreted so that only the domestic law of the respondent state is observed. For Article 6, paragraph 1 of the Convention to be applicable in its civil aspect, it is sufficient that the outcome of the proceedings is decisive for private rights and obligations.[34]

Accordingly, the European Court also brings administrative disputes under the civil aspect of Article 6, paragraph 1 of the Convention. The assumption is that the rights or obligations that are the subject of an administrative dispute fall within the framework of the Convention "atione materiae," which means that the dispute must be about rights that the Convention protects. The application of the principles of good administration through the provision of Article 6 of the Convention, which provides procedural guarantees of the right to a fair trial in civil and criminal proceedings, began in administrative and administrative-court proceedings after the decision of the European Court in the case of Ringeisen v. Austria.[35]

Namely, the European Court found in the case mentioned above that "Article 6, paragraph 1, covers all procedures whose outcome is decisive for private rights and obligations, regardless of the nature of the regulations governing how

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[34] Omejec, J., Convention for the Protection of Human Rights and Fundamental Freedoms in the Practice of the European Court of Human Rights. Strasbourg acquis, second updated edition, Zagreb: Novi informator d.o.o., 2014, p. 1020. This point of view was expressed in the ECtHR case Pudas v. Sweden (judgment of October 27, 1987, request no. 10426/83): In accordance with the well-established practice of the Court, the term "civil rights and obligations" it must not be interpreted only by reference to the domestic law of the respondent state and Article 6, paragraph 1 ... applies regardless of the status of the parties, as well as the nature of the legislation governing the manner in which the dispute should be resolved and the nature of the authority to which has been assigned jurisdiction in that matter; it is enough that the outcome of the proceedings must be decisive for private rights and obligations (see especially the Deumeland judgment of May 29, 1986 ... § 60, the Baraon judgment of July 8, 1987, ... § 42)."

[35] In the Ringeisen v. Austria case, the European Court had to answer the question of whether the applicant in the specific case was the victim of a violation of Art. 6. Paragraph 1 of the Convention in the procedure conducted before the competent authorities for the approval of the transfer of real estate, which was agricultural land in nature. The Government of the Republic of Austria considered unacceptable the applicant's reference to Art. 6. paragraph 1 of the Convention emphasizing that the said dispute is not a dispute about civil rights and obligations. See: Omejec, J. (2006). Status of civil servants, Croatian public administration, 6 (2), p. 47.-81.

a case is resolved (civil, commercial, administrative law etc.) or the body with jurisdiction over the case (ordinary court, administrative body, etc.).[36]

Article 6, paragraph 1 of the Convention, in the part that refers to the right to a trial within a reasonable time as one of the elements of the right to a fair trial, introduces the factor of "time" as an essential condition for realizing justice. Given that lengthy court proceedings could threaten the efficiency, but also the credibility of the judiciary, the European Court emphasizes the importance of administering justice without delay, prescribing that court proceedings must be completed within a reasonable time, which, according to the author, applies analogously to the conduct of administrative proceedings. In this context, Šikić points to the unquestionable connection between administrative and administrative court proceedings in the Croatian legal system, considering that when considering the issue of protracted proceedings before the Administrative Court, the fact of a large number of pending cases before public administration bodies cannot be ignored, because the administrative court proceedings are linked to the previous conduct of the administrative of the procedure.[37]

Thus, from that perspective, the duration of the proceedings before the Administrative Court cannot be separated from the previous duration of the administrative proceedings.[38]

The judgment of Počuča v. Croatia (2006)[39] is the first in a series in which the European Court found for the first time a violation of Article 6, paragraph 1 of the Convention because the Constitutional Court of the Republic of Croatia

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[36] This point of view is especially important in cases between an individual and the state. In these situations, the European Court took the position that it is not decisive whether the public authority of a certain state acts as a private Person or as a sovereign authority. The focus here is entirely on the "type of law itself". Grbić, S., Fair trial in civil proceedings in Croatia in the light of Article 6, paragraph 1 of the European Convention on Human Rights, Doctoral dissertation, University of Rijeka, Faculty of Law 2012, p. 18-19.

[37] Šikić, M. (2009). The right to a trial within a reasonable time in proceedings before the Administrative Court of the Republic of Croatia, Proceedings of the Faculty of Law University of Rijeka, 30 (1), p. 334.

[38] Ibid

[39] Judgment of Počuč v. Croatia of June 29, 2006, request no. 38550/02. Judgments of the European Court see at http://hudoc.echr.coe.int/hudoc and at http://www.pravosudje.hr/. The administrative proceedings were initiated on 23 June 1998. However, the period to be considered did not begin until 28 August 1998, when the applicant lodged an appeal due to the silence of the administration. Then a "dispute" arose in the sense of Article 6, paragraph 1 of the Convention. At the time of the European Court's judgment (June 29, 2006), the period in question had not yet passed finished. Until then, it lasted almost seven years and nine months. During that period, three decisions were made on the applicant's main request.

did not take into account the length of the administrative procedure that preceded it in its assessment of the reasonable distance of the procedure administrative dispute (related to the silence of the administration).[40] It is of particular importance that the European Court of Justice pointed out that the procedure before the administrative authorities should be included when calculating the total duration of the procedure in terms of Art. 6 of the Convention in situations where, based on domestic legislation, the applicant must exhaust the previous administrative procedure before the turn to the Administrative Court. The verdict followed this rule in Štokalo et al. v. Croatia (2008),[41] in which the European Court additionally found that a constitutional complaint is not an adequate domestic legal remedy against the unreasonable length of administrative procedures (violation of Article 13 of the Convention) and found that in this Article 6, paragraph 1 of the Convention was also violated in the case because the length of the procedure was excessive and did not meet the "reasonable time" requirement. The European Court found a violation of the extreme length of the procedure in the judgment Tomljenović v. Croatia (2007)[42], referring to its previous practice, and found that the Constitutional Court did not consider the duration of the procedure before initiating an administrative dispute. The judgment Božić v. Croatia (2006)[43] is the first judgment in which the problem

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[40] The European Court established that administrative proceedings before administrative bodies must be taken into account when calculating the total length of proceedings in the sense of Article 6 of the Convention, and that the practice of the Constitutional Court does not respect that rule: "... practice ... shows that the Constitutional Court, when decides on constitutional of the lawsuit, which refers to the length of the proceeding before the Administrative Court, does not take into consideration its total duration. Turns off the period during which the proceedings in the case were ongoing before the administrative authorities due to the special means that

[41] Judgment Štokalo et al. v. Croatia of October 16, 2008, request no. 15233/05. The first administrative procedure was initiated on June 16, 1997. However, the period to be taken into consideration began only on April 18, 2003, when the applicants appealed against the first-instance decisions. Then a "dispute" arose in the sense of Article 6, paragraph 1 of the Convention. At the time of the judgment of the European Court (October 16, 2008) the proceedings are not over yet. Until then, they lasted for five years and five months, during which one decision on merits was made.

[42] Judgment Tomljenović v. Croatia of June 21, 2007, request no. 35384/04

[43] Judgment Božić v. Croatia of June 29, 2006, request no. 22457/02. The administrative procedure was initiated on September 18, 1997, and on June 14, 1999, the Regional Office in Sisak issued a decision rejecting the applicant's request. However, the period to be considered did not begin until 9 July 1999, when the applicant lodged an appeal against that decision, as a "dispute" within the meaning of Article 6 Paragraph 1 of the Convention then arose. The period in question had not yet ended on the day of the judgment of the European Court on June 29, 2006, because the case was still before the Constitutional Court. Until then, it lasted almost seven years. During that period, eight decisions were made (including the judgment of the administrative court) and the case was examined by three levels of jurisdiction.

of the absence of an effective domestic legal remedy against the unreasonable length of administrative procedures caused by the repeated return of the same case for retrial due to an incompletely determined factual situation (the so-called "ping-pong") was revealed dealing with cases). Similar to the judgment Božić v. Croatia in 2011, the European Court found in the judgment Jovičić v. Croatia[44] that the length of the proceedings, in this case, was excessive and that it did not meet the requirement of a "reasonable time" because in this case the leading cause of the length of the proceedings was repeated returns to repeated proceedings due to incompletely established factual situation.[45]

Analyzing judicial protection against excessively long administrative decision-making in the cases of Slovenia and North Croatia, Kovač and Đanić [46]conclude that it is necessary to prepare additional necessary organizational adjustments because not all problems can be solved by law alone, mainly because of the unreasonable length of administrative procedures. If no systematic changes are introduced but only minor legal changes, as so far in most Eastern countries, we can only talk about embellishing good administration to please international observers. All the mentioned aspects can significantly contribute to the systematic judicial control and, finally, the rule of law we strive for.[47]

In their comparative analysis of administrative claims in Croatian, Slovenian and European Union law, the authors Đanić, Čeko and Kovač[48] point out that the administrative procedure requires common regulation within the European administration, as well as the distribution of tasks in executive integration. Although the European administration has grown significantly in the last few decades, the EU does not have a comprehensive law regulating the procedural rights of citizens in the European administrative procedure. Suppose we keep in mind the comparative view between Slovenia and Croatia. In that case, we conclude that both countries have faced and are still facing the problem of too-

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[44] Judgment Jovičić v. Croatia of June 21, 2011, request no. 23253/07

[45] Ibidem

[46] Sever. T., Đanić A. and Kovač P. (2014). Judicial protection of timely decision-making in administrative matters in the light of european convention on human rights in Slovenia and Croatia, NISPAcee Conference, Budapest, May 2014 WG X: Working Group on Good Governance, HR and Development in Weak, Crisis an Post-conflict States str. 1-14.

[47] Ibidem

[48] Đanić Čeko A. Kovač, P., comparative analysis of an administrative appeal in croatian, slovenian, and eu law eu 2020 – lessons from the past and solutions for the future 4 (2020) https://hrcak.srce.hr/ojs/index.php/eclic/article/view/11940/5915 str. 1065-196

long procedures at the national level. However, Slovenia has improved, while Croatia still deals with larger systemic problems.

3.1.2. Recommendation of the Council of Ministers to the states regarding good public administration

According to Šimac, the emphasis on good public administration appears most fully in the Recommendation of the Council of Ministers to the states on good public administration (hereinafter: Recommendation Rec(2007)7).[49] Recommendation Rec(2007)7 of the Committee of Ministers of the Council of Europe of July 20, 2007, which refers to good public administration, recommends that the governments of the member state promote good governance within the framework of the principles of the rule of law and democracy and that they promote good governance through the organization and functioning of public authorities which ensure efficiency, effectiveness and prudent spending of funds, and to promote the right to good governance that is in the interest of all citizens, respecting the norms of the Code found in Recommendation Rec(2007)7 itself.[50] The model code of good governance is an integral part of Recommendation Rec(2007)7, which consists of 23 articles in which, in addition to the scope of application, the principles and rules of good governance are stated. Recommendation Rec(2007)7 states the following principles: legality, equality, impartiality, proportionality, legal certainty, taking action within a reasonable time, participation, respect for privacy and transparency (Articles 2-10). The rules refer to definitions, the initiation of administrative proceedings, requests of private persons, the right of private persons to be heard with individual acts, the right of private persons to be involved in certain non-regulatory decisions, bearing the costs of the procedure, the form of administrative decisions, their publication, entry into force, execution and subsequent changes of those decisions (Art. 11-21). Finally, the Code contains rules regarding legal remedies and damages (Articles 22 and 23).

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[49]   CM/Rec (2007)7, The full text of the Recommendation is available at: https://rm.coe.int/16807096b9(27.04.2023).

[50]   Šimac, N. (2016). The right to good public administration, Proceedings of the Faculty of Law in Split, 53 (1), p. 108.

3.1.3. Recommendation R(2000)10 of the Committee of Ministers of the Council of Europe on the Code of Conduct

Concerning its task of promoting and protecting parliamentary democracy, the rule of law and human rights, the Council of Europe, within its institutions, also considered the need to define standards related to civil servants when it comes to the reform of state administration, and among other things, adopted Recommendation R (2000)10 of the Committee of Ministers of the Council of Europe on the Code of conduct of public officials (hereinafter referred to as Recommendation R(2000)10).[51] prepared by the Multidisciplinary Group against Corruption in 28 articles lays down the basic rules that officials should adhere to in their work. They relate to the performing functions, relationship to politics, responsibility, reporting, conflict of interest, political or public activity, protection of privacy, abuse of position, termination of service, etc.[52] Member governments are recommended to support and adopt in national legislation, but also within national principles of public administration and codes of conduct for civil servants based on the model adopted as part of the Recommendation.[53] In the explanation of the Recommendation, guidelines are also given regarding the form and style of national codes, and individual provisions of the model code and their meaning are elaborated in more detail.[54]

3.1.4. Charter of Fundamental Rights

The Charter of Fundamental Rights is a complex and extensive document whose content corresponds to the conclusions of the European Council meet-

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[51] Council of Europe, Parliamentary Assembly, Recommendation 1617(2003) on Civil Service Reform in Europe; Recommendation No.R(2000)6 of the Committee of Ministers to Member States on the Status of Public Officials in Europe; Recommendation No. R(2000)10 of the Committee of Ministers on Codes of Conduct for Public Officials, Art. 15b. The Statute of the Council of Europe gives the authority to the Committee of Ministers to adopt recommendations to members on issues that the Committee agrees on as "common policy". Recommendations are not binding for members, but the Statute is authorizes the Committee of Ministers to request from the member governments information on the actions taken based on the recommendations.

[52] The Recommendation on civil service reform particularly emphasizes the need for reform and modernization of public administration, application of the principle of subsidiarity, depoliticization of public administration and strengthening of professionalism and improvement of staff quality. Koprić, I., Musa, A. and Lalić Novak, G. (2012). European administrative space, Institute for Public Administration, Zagreb, p. 158.

[53] Ibid

[54] Ibid

ing and represents a kind of codification inspired by different sources.[55] Here, the critical role belongs to the Court of the European Union, whose task is to abolish legislative and other acts of the Union that are not by the Charter, and its past practice shows that it is ready to do so.[56] The Charter of the European Union on Fundamental Human Rights clearly defines the rights of EU citizens.[57] Its main goal was to ensure that the European Union respects and protects fundamental rights in its legislation and various policies. According to Koprić, the Charter is vital because it establishes the right to good administration.[58] This means that everyone (not only an EU citizens) has the right to treat their case impartially, fairly and within a reasonable time frame.[59] This includes the right to be heard, the right to access the documentation of the case in question, respecting the confidentiality of information, professional and business secrecy, and the duty to state the reasons the decision in the specific case is based.[60] The provisions of the Charter bind all institutions, bodies and agencies of the European Union, but it does not extend the powers and jurisdiction of the Union. Still, the Union must be guided by the principle of subsidiarity when applying the Charter (the principle according to which decision-making on common issues must be transferred to the lowest possible level of social organizations, while the central government has only the role of supplementing political decision-making at the local level). The Charter binds all central and local bodies of the member states when they apply Union law. The Charter guarantees that no human right contained in it may be interpreted in such a way as to diminish or adversely affect the already achieved level of protection of such a right in Union law, other international treaties or the constitutions of member states.

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[55] Vezmar Barlek, I. & Bačić P. (2017). Application of European union law in administrative disputes, Judicial Academy, Zagreb, August 2017. p. 9.

[56] Ibid

[57] Barić, S. & Bodiroga-Vukobrat, N. (2002). Charter of Fundamental Human Rights of the European Union with Commentary, Zagreb, Organizer,

[58] Koprić, I. (2009). New Law on General Administrative Procedure - Tradition or Modernization, Modernization of General Administrative Procedure and Public Administration in the Republic of Croatia, Institute for Public Administration, Zagreb, Croatia: Društveno veleučilište, p. 34.; Koprić I. (2014). European standards and modernization of administrative adjudication in Croatia, Europeanization of administrative adjudication in Croatia, Institute for Public administration, Zagreb, Croatia, p. 7.

[59] Ibid

[60] Ibid

Therefore, from the content of the provisions of the Charter, it can be concluded that the Republic of Croatia, as a member state of the European Union, is obliged to respect and apply all the provisions of the Charter, including those that proclaim the right to good state administration.

3.1.5. Principles of good governance

In the European Union, the concept of "good governance" was elaborated through the White Book of the European Union entitled "European Governance", published by the Commission of the European Communities in 2001.[61] With that document, the European Commission sets guidelines that should serve as a basis for developing public administration and the European Union.[62] The document states that European integration has ensured fifty years of stability, peace and economic prosperity.[63] Analyzing the doctrine of "good administration", Klarić and Lozina state five principles[64] on which good administration should be based, namely the principle of openness[65], participation[66], responsibility[67], effectiveness[68] and connection[69]. However, good administration is not only related to legal aspects but also refers to the quality of management, espe-

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[61] Lozina D. and Klarić M., repet quote (note 36) p. 28.

[62] Ibid

[63] Ibid

[64] Ibid

[65] Thus, the principle of openness in the work of the administration is stated to be a principle aimed at direct communication between the public administration and citizens, and other entities that are users of its services. Ibidem p.

[66] There are several different studies on the topic of citizen participation, especially the role of participation, as well as the passivity of citizens in participating in the performance of various public tasks was elaborated in works dealing with New Public Management.

[67] The basis of the concept of "good administration" lies precisely in the awareness of the responsibility of political actors for their own actions, both in the field of executive activity.

[68] The principle of effectiveness is the principle that forms the basis of implementation management in the public sector. It is especially emphasized that this principle is crucial in the analysis of the results of implementation management, the effects of which are analyzed on the basis of output data related to the activities of various administrative institutions in the public sector.

[69] The principle of coherence, according to the Commission's understanding, is a principle that indicates that the policies implemented by the institutions of the Union should be mutually compatible and easy to understand. Because of all the above, this principle requires leadership with authority and strongly expressed responsibility for the work of institutions. This principle is not only characteristic of the institutions of the Union, but is also applicable to the public administration and institutions of the member states, and is one of the fundamental principles on which the organization of public administration should rest.

cially to the management of human resources, the training and improvement of employees and the change of mentality (therefore, it also includes the prevailing organizational culture).[70]

Regarding the principles of good administration, it should be emphasized that SIGMA[71] defined the primary European administrative standards.[72] They represent informal acquis, namely: (1) the rule of law, in terms of legal certainty and predictability of administrative action; (2) openness and transparency of public administration actions; (3) responsibility of public administration to legislative and judicial bodies and hierarchical responsibility; (4) efficiency in the use of public revenues and efficiency in achieving the goals of public policies. These principles can generally be considered the foundations of the legitimacy of public administration in a democratic society.[73] Although often informalized in written law, these principles are still considered ethically and legally binding.

3.1.6. The European Code of Conduct for Administrative Employees

The European Code of Good Behavior of Employees in Administration[74] is undoubtedly the most serious initiative to codify the rules of administrative procedure in Union law, which was launched at the initiative of the Ombudsman of the Union, who tried to elaborate the term "good administration"[75] and determine how this term should be interpreted in the application.[76]

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[70] The Right to Good Administration, Proceedings of the European Conference, Warsaw, 4-5 December 2003: 135-136.

[71] SIGMA – Support for Improvement in Governance and Management in Central and Eastern European Countries – is a joint initiative OECD and the European Union. This initiative encourages and supports public administration reform in countries in transition. It is mostly financed with the funds of the Phare program of the European Union.

[72] Musa, A. (2006). European standards of civil service law and the Law on Civil Servants. Croatian public administration, 6(4), p. 93.

[73] Ibidem

[74] See the full text of the Code at: https://www.ombudsman.europa.eu/hr/publication/hr/3510(27.04.202.

[75] Institution of the Ombudsman, better known in the world as ombudsman (a word of Swedish origin; French médiateur German Bürgerbeauftragter; Spanish defensor del pueblo), finds its roots in the Scandinavian institution justitiae ombudsman, parliamentary commissioner for the protection of citizens' rights before the state administration and bodies that have public powers.

[76] Đerđa, D. op. cit. (note 7) p. 125.

For this purpose, the proposal and draft of the Code were approved by the European Parliament in its resolution of September 6, 2001, by which it ordered that the institutions of the European Union respect the Code in their relations with citizens "with everyone" in the EU.[77] In the Code, an attempt was made to summarize the rules that have already been established in various sources of primary and secondary law of the Union, but also the rules established by the practice of the European Court, which were often based on solutions from the national legal systems of some member states. This Code thus establishes the obligation to act lawfully by institutions and bodies that apply the law of the Union, the prohibition of discrimination on any basis and the obligation of equal treatment of all persons in the same situation, as well as the mandatory application of proportionality when making decisions concerning the purpose to be achieved by that decision.[78] The Code sets many obligations that the official must respect when conducting the procedure. First of all, it establishes the necessity of the independence of the official in order to be able to make a legal decision. It emphasizes the need for his objective behavior during the entire procedure, the fair attitude of the official towards the parties and his impartiality in making the decision. At the same time, the Code requires officials to be courteous in their treatment of the parties and to provide them with advice and assistance in procedural matters about which they do not have sufficient knowledge. Following this Code, institutions and bodies conducting administrative proceedings must respect the legitimate expectations of the parties and the abuse of official powers for the sake of the officials' gain is prohibited. The Code establishes the fundamental procedural right of the party to be heard and gives statements in the procedure to be well informed about the conduct of the procedure. It opens the possibility of inspecting the file and imposes on the body the obligation to protect data protected by law.

Furthermore, it prescribes the duty of Union institutions and bodies to communicate with the parties in any language of the Union, the handling of submissions by non-competent bodies, and the obligation to inform the party about

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[77] Ibid

[78] The European Code of Good Administrative Behavior is a key tool with which the ombudsman performs his dual role. He uses the Code to would examine whether in a particular case it is a question of bad management, relying on its provisions when performing its role as a controller. However, the Code also serves as a useful guide and source of information for civil servants, encouraging the highest standards of governance through its existence.

the official handling of the case, including contact information[79]. It prescribes that every decision should be made within a reasonable time, how it should be explained, contain instructions on the legal remedy and that it should be delivered in writing without delay to all persons to whom it applies. Although this Code was adopted by the resolution of the European Parliament on September 6, 2001, it still only has the so-called soft law application, which slows down efforts to codify the rules of administrative procedure in Union law.

The Code helps citizens to get an insight into the standard of administration that they should expect from the EU institutions. At the same time, the public relations guide is helpful for officials. By concretizing the principles of good administration, the Code strengthens the highest standards in administration.

3.2. Positive legal regulation of state administration and its application in the legal system of administrative procedures in the Republic of Croatia

By creating its legislation, each national state must comply with the provisions of international Law and European standards. Equally, every country must incorporate into its national legislation the international standards and practices mentioned in the previous chapter, specifically regarding administration and administrative Law. For the good functioning of the administration, the legal rules by which the administration acts concerning the parties are also essential. Good procedural rules directly contribute to the efficiency of modern public administrations.[80]

In the Republic of Croatia, the state administration is standardized in a certain way through various acts that ensure its functioning. The Law regulates the entire state administration system on the State Administration System[81], stipulating in Article 3 that state administration bodies perform state administration tasks. The tasks of the state administration are performed so that citizens can exercise their rights guaranteed by the Constitution and interests protected by

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[79] Ibid

[80] Britvić Vetma & Pičuljan N. B (2016). Legal arrangement and main features of administrative procedure in the Republic of Croatia, Proceedings of the Polytechnic in Šibenik, 3-4, p. 37.

[81] National Gazette no. 150/11, 12/1, According to the provisions of Article 3 of the Law on the State Administration System, state administration tasks are performed by state administration bodies. State administration tasks determined by a special law can be entrusted to local and regional self-government units or to other legal entities that have public powers based on the law.

Law and effectively fulfill their civic duties.[82] Within the limits of their scope, state administration bodies perform the tasks of implementing state policy, direct implementation of laws, inspection supervision, administrative supervision, other administrative and professional tasks, and other tasks expressly assigned to them by Law.[83] The Law on the Organization and Scope of Ministries and Other Central Bodies of State Administration organizes ministries, state offices and state administrative organizations and determines their scope.[84] The Law on Civil Servants[85], concerning the conduct of civil servants, determines the basic principles that civil servants are obliged to adhere to[86] establish an appropriate civil servant policy in the stabilization, depoliticization and professionalization of the civil service. Namely, the essential purpose of the regulations regulating the position of civil servants is to establish mechanisms of control and responsibility to prevent abuse of public authority and inefficient management of public revenues. Every civil servant should be educated, with a remarkable degree of professionalism and integrity, subject to legal regulations that enable the adequate performance of functions, which protect him from the interference of politics and interest groups, and ensure adequate salary to reduce the possibility of corruption and ensure the selection of candidates for the service that is based on abilities, to select the most suitable candidate and exclude the possibility of patronage.

In the context of the national legislation of the state administration, the administrative procedure plays an unavoidably important role, without which the state administration could not exist. In Croatia, the administrative procedure is determined by the Law on General Administrative Procedure[87] as a "lex ge-

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[82] Art. 11 of the Law on the State Administration System

[83] Art. 50, paragraph 1. of the State Administration System Act

[84] National Gazette, no. 85/20.

[85] National Gazette, No. 92/05, 140/05, 142/06, 77/07, 107/07, 27/08, 34/11, 49/11, 150/11, 34/12, 49/12, 37/13, 38/13, 01/15, 138/15, 61/17, 70/19, 98/19.

[86] Principle of legality and legal certainty, Principle of prohibition of discrimination and privilege, Principle of hierarchical subordination Principle of responsibility for results

[87] The current Law on General Administrative Procedure was published in "Narodne novine", no. 47/09 of April 17, 2009, and entered into force on 1 January 2010. With its entry into force, the Law on General Administrative Procedure ceased to be valid after 53 years ("Official Gazette of FNRJ", no 52/56, "Official Gazette of the SFRY", number 10/65, 18/65 - revised text, 4/77, 11/78, 32/78 - revised text, 9/86, 16/86 - correction, 47/86 –consolidated text) which is the Act on the Adoption of the Act on General Administrative Procedure in the Republic of Croatia ("Official Gazette", No. 53/91 and 103/96) became part of the legal system of the Republic of Croatia.

neralis" law and numerous procedural provisions in special laws. The administrative procedure can be defined as a set of legal rules that regulate the way administrative bodies (other state bodies and legal entities) operate when these bodies, by applying substantive legal regulations to a concrete social relationship, pass their administrative acts that decide on the rights, obligations or legal interests of certain subjects (individuals, legal entities or other parties).[88] In line with this, the public law body must know and follow the change of every legal regulation that it applies in its work because, otherwise, it cannot make a legal decision. Therefore, Đerđa is right when he states that only the conduct of administrative proceedings and the correct interpretation and application of substantive Law guarantee that a legal and proper decision will be made in a specific administrative matter.[89]

In the administrative procedure, the administrative body must resolve the administrative matter by adopting an administrative act (decision). After that, in the event of an administrative act being challenged, it is the task of the court to determine in the administrative dispute whether a legal decision was made by the administrative body in the administrative matter.[90] However, one of the more significant problems that still exist in the work of the state administration,[91] and which was already detected earlier in this paper through the judgments of the European Court, is the inactivity of the work of the state administration bodies, which cause-and-effect leads to cases of the unreasonable length of the administrative procedure and cases of the silence of the administration.[92] This

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[88] Borković, I., Administrative Law, Informator, Zagreb, 1995, p. 365.

[89] Đerđa. D., (2010). General administrative procedure in the Republic of Croatia, Engineering Bureau, Zagreb, Croatia p. 63.

[90] Britvić Vetma B, Piculjan. N., op. cit. (note 82), p. 44.

[91] Regarding the whole complex of the right to a fair procedure, the right to a procedure that would be completed within a reasonable time is imposed from the perspective of the Croatian legal system as one of the most problematic. Namely, the issue of the duration of court proceedings - if we exclude the so-called institute silence administration - is treated in the context of the Croatian legal tradition with at least a certain amount of nonchalance and carelessness.« Uzelac, Alan, Croatian procedural law and the guarantee of "fair procedure" from the European Convention for the Protection of Human Rights and Fundamental Freedoms, Collection Faculty of Law, University of Rijeka, v. 19, Supplement, 1998, p. 1020-1021.

[92] The silence of the administration is the failure of the competent body of public administration to pass and submit a decision within certain deadlines provided by law parties, and this omission may lead to certain legal consequences. The duty of public administration bodies is prescribed by a larger number constitutional and legal provisions, and the deadlines for making decisions are specified in the Republic of Croatia by provisions of the ZUP and ZUS, as well as individual special regulations.

is additionally confirmed by the recent judicial practice of the Constitutional Court of the Republic of Croatia, in which "The Constitutional Court assesses that the means of legal protection against the silence of the administration are very often not effective for speeding up the administrative procedures themselves, which is demonstrated by the administrative practice in the Republic of Croatia." The Constitutional Court, therefore, determines that even though the inactivity or ineffectiveness of state administration bodies, other state bodies and legal entities with public powers, when deciding on the rights, obligations or legal interests of a party in administrative proceedings in administrative proceedings, viewed together with the duration of the initiated administrative dispute, can lead to a violation of Article 29 paragraph 1 of the Constitution of the Republic of Croatia [93] and Article 6 paragraph 1 of the Convention in the part that refers to the reasonable length of decision-making on the rights and obligations of the parties. The duration of the administrative dispute before the Administrative Court of the Republic of Croatia does not show the actual time of the "disputed" period of decision-making on the specific administrative matter. Therefore, according to the legal position of the Constitutional Court, in the future, when deciding on a possible violation of Article 29, paragraph 1. of the Constitution and Article 6, paragraph 1 of the Convention, in the part that refers to the reasonable length of the procedure, the duration of the administrative dispute should be taken into account together with the duration of the previous administrative procedure in the same administrative matter, with the fact that it is calculated from the day when a "dispute" has arisen in the sense of Article 6 paragraph 1. Convention."

Although this paper discusses, among other things, the shortcomings of the unified administrative procedure in the Republic of Croatia, which consequently call into question the sustainability of the efficiency of the state administration, it is essential to mention here that in 2016 the European Parliament proposed to the European Commission the adoption of the Regulation on Open, Efficient and Independent Administration of the European Union and drafted a proposal for its text, which has not been adopted to date.[94] The regulation is

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[93] The Constitution of the Republic of Croatia as a unique general legal act with the highest legal force in the Republic of Croatia, Narodne novine, no. 56/90.,135/97., 8/98., 113/00., 124/00., 28/01., 41/01., 55/01., 76/10., 85/10. and 05/14).

[94] For more details, see: Đerđa, D. Jerčinović, A. Administrative procedure in the law of the European Union: codification... Proceedings of the Faculty of Law in Split, vol. 57, 1/2020, p. 85-126.

necessary because it would unify the basic rules of administrative procedure, fill the existing legal gaps and correct the shortcomings observed so far. Such a regulation would strengthen the transparent work of the state administration, improve its efficiency in providing public services and speed up the implementation of rights.

However, the authors think that results can be obtained only through the tools of public management that will ultimately lead to a modern and unified state administration. Increasing the efficiency and effectiveness of the state administration is based, among other things, on introducing a managerial spirit into the state administration.

The problems that the authors observed, obtained through the research of many authors and experts mentioned in this paper, indicate that the state administration in the Republic of Croatia is intertwined with many problems, of which the authors would single out six critical problems. These are: politicization, insufficiently qualified staff, inaccessible communication with citizens, unequal treatment in employment, corruption and lengthy administrative procedures, and this work is mainly devoted to this problem. Following this, crucial questions and problems related to public management in Croatia exist. Some of these questions are: Why should similar reforms to increase the efficiency and quality of state administration not be implemented in Croatia? Why not reform the state administration, strengthen the country economically and preserve the existing level of social security? Is it possible to get out of the crisis with administrative reforms?

Solving the mentioned problems, as well as the answers to the mentioned questions, according to the authors,[95] can only be seen through the prism of public management of the state administration, that is, through depoliticization, professionalization as the strengthening of the training of civil servants and state employees, the introduction of a competitive spirit through employee rewards, the implementation of the so-called the merit principle (recruitment and promotion in the civil service following the abilities of civil servants)[96], the

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[95] Public management is an effort to introduce most of the values and techniques of the private sector and market criteria into the public sector, to make it a more effective and competitive business style, oriented to results.

[96] Woodrow Wilson, American professor and 28th president of the USA. Wilson was outraged by the patronage system that caused corruption and inefficiency in public administration. The basis of his entire thought was the point of view of public administration as a neutral instrument, separated from politics and the concrete regime. His reform demands were for the business part of governance to be carried out in a reliable and business-like manner, and in order to be able to do so, it must become

responsibility of civil servants through the existing legal regulations and finally the introduction of supervision over the work of civil servants by managers. Of course, there is a long process ahead for the implementation of the assumptions for the introduction of public management in the state administration, and it is up to our ruling administration which models and assumptions to apply to the reform of its state administration, following national interests.

4. CONCLUSION

The right to efficient state administration is proclaimed through a wide range of documents and the practice of the European Court, which are also incorporated into our national legislation. Analyzing the documents of the Council of Europe (Convention and Recommendations) and the documents of the European Union (Charter, Principles and Code), which are exposed in the context of this issue, we conclude that the standard and fundamental goal of all documents is to improve the speed and efficiency of the state administration's actions towards all citizens, ensure appropriate participation and information during administrative procedures, monitor efficiency and develop efficiency indicators for citizens and users of all public services, strengthen the education and competencies of all civil servants in the state administration. An insight into the adopted strategies as well as research on the work and operation of the state administration, leads to the conclusion that the state administration in the Republic of Croatia is still subject to criticism because the adopted documents did not achieve the desired results and for now remain just a dead letter on paper.

This is proven by the views of eminent experts, most of whom agree that the critical problems of state administration are politicization, insufficiently skilled and professional staff, inaccessible communication with citizens, unequal treatment in employment, corruption, and the lengthy resolution of administrative procedures, which the authors singled out as the most relevant. It can rightly be concluded that the Republic of Croatia, for now, has not responded to the problems that the acceleration of legal life brings to it in administrative procedures and that in these procedures, the adoption of administrative acts is delayed. According to the author's opinion, the reform of the state administration can be

non-political, i.e. appointments must be based on merit and abilities according to the so-called "merit system".

an immediate reason for the modernization of the state administration, where education should have a special place. From the judgments presented by the European Court, which refer to the violation of Article 6, Paragraph 1 of the Convention in the context of the right to a fair trial regarding the unreasonable length of administrative procedures, it can be concluded that in our state administration system, there are severe problems of inconsistency in the work of bodies state administration with the standards proclaimed by the Convention.

In the judgment of Počuča v. Croatia, the European Court expressed the view that when deciding on a reasonable decision-making period in a specific case, the total duration of the administrative and administrative court proceedings should be considered, and not just the time of the proceedings before the Administrative Court of the Republic of Croatia. After that, the Constitutional Court of the Republic of Croatia took the same position in decision U-IIIA-4885/2007. from June 20, 2007. In the case of Vajagić v. Croatia, the European Court warned that the multiple returns of cases to the first administrative level for re-decision make it impossible to decide within a reasonable time and the efficiency of the entire system of handling cases before domestic authorities. Judgments of the European Court of Human Rights have warned about the excessive duration of administrative procedures, the lack of an adequate legal means to protect the right to decide within a reasonable time (poor regulation of the institution of administrative silence), and shortcomings in meeting the obligation of judicial control of administrative acts before a court of complete jurisdiction.

Efficient administration imposed itself as a functional need of the European democratic society, which puts the center citizens as the basis of their activities. Effective administration is based on the principle of good governance and represents European standards for public sector management. The highest level of professionalism in public administration, i.e., implementing the principles of availability, responsibility, transparency and efficiency, is imperatively linked to the rule of law principle.

The provisions of the right to good administration from Article 41 of the Charter of Fundamental Rights of the European Union are unique, as in national legal systems, as well as in the legal system of the European Union and legally binding for all countries' members of the European Union, and not only for its institutions. The right to good administration is considered by many to be the basis of the Constitution. Union law that defines European public ad-

ministration. Fundamental rights and efficient state administration are critical to Croatian and European identity. They are an essential part of the legal acquis for the Court of the European Union. However, they are also crucial for the unique economic development of the Republic of Croatia as a member of the EU.

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MARKET VALUE OF BROILER MEAT ACCORDING TO THE METHOD OF PROCESSING AND MARKETING

Igor KRALIK, Ph.D.

Josip Juraj Strossmayer University of Osijek,
Faculty of Agrobiotechnical Science Osijek

E-mail: ikralik@fazos.hr

Abstract

This paper aimed to investigate the market values of Ross 308 hybrid broiler meat through various processing and marketing methods. The research shows the production characteristics of broilers, the proportions (g, %) of significant carcass parts (breast, thighs with drumsticks, back, and wings), and the breast fillet. Based on the weight proportions of the primary carcass parts and the market's cost price, the carcasses' market value is presented in three ways. The marketing of broiler meat is shown: as whole carcasses (model A), as retail cuts (model B), and as breast fillet combined with the remaining parts of the carcass (model C). Production and economic indicators in fattening are presented using the Productive Efficiency Index (PEI=357), the European Broiler Index (EBI=346), and the Economic Efficiency Index (EEI=1.38). By marketing retail cut carcasses, or the breast fillet and the remaining parts, a higher market value is achieved by 25.37% or 30.65%, respectively, compared to the marketing of broiler meat as whole carcasses. According to models, efficiency and profitability rates (%) were as follows: A=1.24 and 19.37%; B=1.46 and 34.45%; and C=1.44 and 30.66%. The research results show the suitability of Ross 308 hybrids for meat production. At the same time, the market value of the carcasses differs according to the method of processing for marketing at a specific cost price. All three broiler meat processing and preparation models suit the market, and economic indicators depend on the selected model.

Keywords: *carcass characteristics, market value, PEI, EBI, EEI*

JEL Classification: Q13, Q19

1. INTRODUCTION

The total number of poultry in the year 2021 amounted to 12.1 million poultry birds, which represents a decline of 7.4% compared to the figures in 2020. This was primarily due to the smaller number of broilers, which was 13% and accounted for 66% of the total poultry. At the same time, the number of laying hens increased by 13.7%, which resulted in increased egg production. In 2021, fresh and chilled poultry meat imports amounted to 4 851 t, while frozen meat imports reached 6 273 t. The self-sufficiency of poultry meat production decreased from 101.2% in 2016 to 70.66% in 2020 (Green Report, 2022). The data mentioned above have been incentives for this research on increasing broiler meat production with the projection of economic indicators (financial result, profitability, and cost-effectiveness coefficient in rural areas). In the production of broiler meat, genotypes that grow fast are used, and the production management is adapted to the set goal: high yields, low feed conversion, and satisfactory meat quality. When this approach is applied, the objectives of manufacturers and consumers coincide. The modern production of broiler meat should meet the requirements of the market. The production of broiler meat is currently demonstrating a tendency to increase, mainly because experts such as nutritionists recommend that people consume less red meat in their diet. The meat of broiler chickens is of satisfactory quality, affordable in terms of price, and according to its organoleptic properties, it meets the consumers' requirements. Significant progress in poultry selection has also been of great importance, resulting in the creation of hybrids of broilers with high proportions of the highest quality parts of the carcass, such as the breast and drumsticks with thighs. The significant progress achieved in selection, feeding, and health care has also influenced the rapid development of poultry production. The fattening phase has been shortened to 35-42 days, during which broilers of 2.4-2.9 kg of live weight can be produced (Ross 308 manual, 2020). Several factors influence the cost-effectiveness of the business. In addition to genetic factors, what needs to be taken into consideration are also paragenetic factors. At the same time, the method of processing carcasses, that is, their preparation for the market, directly impacts profit as well. Cutting broiler carcasses into essential retail parts and placing the meat in the market as breast fillets means reaching the consumers who prefer those kinds of purchases, whereby broiler producers make various profits. The highest quality parts of the broiler carcass are the meat of the chest (white meat) and the meat of the drumsticks with thighs (dark meat). Broiler

meat is a quality animal food considered a dietary product due to its high protein content and low energy value. The paper aimed to investigate the market values of Ross 308 broiler hybrids in various preparations for the market: models A, B, and C.

2. MATERIALS AND METHODS

The study included Ross 308 broilers (mixed sample) that were fattened in the standard way. Feeding of the chickens was conducted using a starter mixture (21% crude protein and 13.5 MJ/kg ME) up until the 21st day, and then a finisher mixture (19.17% crude protein and 12.98 MJ/kg ME) that was used from days 22 to 42. The treatment of carcasses following the Regulation on marketing standards for poultry meat (NN 78/2011-1655). Three possible modalities are assumed for researching the impact of broiler processing and preparation for the market and achieving a financial result: A-selling as carcasses, B-selling as retail cuts, and C-selling as a breast fillet in combination with other retail-cut parts of the carcass (drumsticks with thighs, back and wings). For this purpose, the cut parts of the carcass were weighed, and they were appraised according to the current prices on the market (January 2023) in the following way: the entire carcass was €3.98/kg, breast €5.31/kg, drumstick with thigh €5.31/kg, back €2.66/kg, wings €3.32/kg and breast fillet €8.23/kg. Based on the established yield indicators (Table 3) and the market prices, the market values of the carcasses were calculated when sold in the preparation mentioned above (A, B, and C models). Financial profit is also shown as the difference in the achieved prices for each preparation method. Three models (A, B, and C) of broiler meat production and preparation for small poultry farms suitable for production in rural areas (with a capacity of 500 broilers per round) were made. The research used the previously obtained results on the production characteristics of broilers (Kralik et al., 2018). The paper analyzes production and economic indicators (Marcu et al., 2013; Martins et al., 2016; Kralik et al., 2022) as follows:

Production Efficiency Index (PEI)

PEI=body weight (kg) x survival (%)/fattening duration (d) x feed conversion (kg) x100

European Broiler Index (EBI)

EBI = (survival (%) x daily gain (g)) / feed conversion (kg) x 10

<u>Economic Efficiency Index (EEI)</u>

EEI = cost of feed (€) starter + finisher/kg of carcass

Based on the calculated production-economic indicators, a projection of the financial result for A, B, and C production models was made.

Financial results, cost-effectiveness coefficient, rates of return, and profitability thresholds were calculated based on total revenue and total costs. The following patterns were used:

C=A-B;

CE=A/B;

R%=C/A x 100;

GR= T x B/A

C-financial result, A - revenue, B - costs; CE cost-effectiveness coefficient; R% - rate of return; GR - profitability threshold

Overview of production-technological indicators:

- ✦ Average live weight = Total weight (kg) / number of surviving broilers
- ✦ Percentage of survivors (%) = Initial number – number of broilers delivered r x100
- ✦ Average daily gain (g) = weight of broilers delivered (kg)/ number of fattening days
- ✦ Feed conversion (kg) = feed consumed (kg) / broiler weight (kg)
- ✦ Consumption of the feed mixture (kg) = feed mixture used (kg) / number of feeding days
- ✦ Mass of eviscerated carcass (kg) = mass of processed carcass without the head, legs, and internal edible and inedible organs

During the research, the following technological properties of breast meat were also monitored:

- ✦ The color of the meat was measured 24 hours after cooling the carcasses to 40 C using the CR400 calorimeter. The following values were used in the color classification: CIE L* 44-53 (meat of standard properties), CIE L* > 53 (PSE meat), and CIE L* < 44 (DFD meat) (Soarez et al. 2009).
- ✦ The pH values were measured using a digital pH meter (Mettler MP 120-B).

- Drip loss (%) = initial muscle weight (g) – final muscle weight (g) / initial muscle weight (g) x 100
- Cooking loss (%) = muscle weight before cooking (g) – muscle weight after cooking (g) /muscle weight before cooking (g) x 100
- WBSF (N) texture was expressed as instrumental tenderness

3. RESULTS AND DISCUSSION

3.1. PRODUCTION CHARACTERISTICS OF ROSS 308 BROILERS

During the broiler fattening, which lasted for 42 days, the gains, consumption, feed conversion, and the chickens' survival until the fattening were monitored. Also shown are feed costs (kg/live weight), feed costs (kg/carcass weight), and the mass of eviscerated carcasses. The results are shown in Table 1.

Table 1. Performance of Ross 308 Broilers in fattening

Description	Indicator
Survival (%)	96%
Average live weight	2509 g
Average daily gain	59.74 g
Consumption of starter feed mixture	1190 g
Consumption of finisher feed mixture	3000 g
Feed costs (kg/live weight)	€1.03
Feed costs (carcass)	€2.58
*Mass of eviscerated carcass	1750 g
Feed conversion	1680 g
Cost of feed/kg of carcass	€1.47

*Eviscerated carcass - carcass without the head, neck, legs, inedible and edible giblets

The achieved production results in fattening correspond to the natural indicators stated for the same hybrid of chickens (Eila et al. 2011; El-Tahaway et al. 2017), and they are better in terms of gains and feed conversion than the results obtained by Gafar et al. 2022. When comparing the results of the research in this paper with the results of individual authors (Table 2), it is necessary to take into account the diversity of the expression of the genetic potential of Ross 308 hybrids of chickens, depending on the factors present in production and the management that is applied during production.

Table 2. Overview of production properties of Ross 308 broilers

Authors	Weight (g)	Survival (%)	Conversion (kg)	Duration of fattening (d)	PEI
Pascalu et al. (2017)	2291	100	1.89	42	290
Gafar (2022)	1917	90	1.71	35	288
Hristakieva et al. (2014)	2435	99	2.18	49	225
Kralik et al. (2022)	2830	97	1.86	42	350
Jamtsho et al. (2022)	2471	90	2.79	56	135
El-Tahaway et al. (2017)	1884	98	2.02	35	261

To achieve success and profitable production in broiler fattening, it is necessary to consider several factors: the correct selection of genotypes, satisfactory paragenetic factors, and adequate management. The abovementioned production factors are also crucial in calculating economic indicators such as the Economic Efficiency Index (EEI) and the Feed Cost Index (CIF).

3.2. Production characteristics of Ross 308 broilers

The calculation of production and economic indicators yields the following values:

Production Efficiency Index PEI=357

European broiler index EBI=346

EEI Economic Efficiency Index=1.38

When calculating the PEI value, natural indicators such as the final average weight of the broiler chickens and survival (%) are used, which directly affect the size of the obtained income. Feed conversion is the main factor of the cost-effectiveness indicators and the duration of the fattening phase (d), which affects the manifestation of the genetic potential. Marcu et al. (2013) recommend that the efficiency of broiler fattening be assessed to show PEI and EBI values. The EBI indicator is appropriate when evaluating various ages of broiler chickens at slaughtering a specific genotype. Kralik et al. (2022) evaluated four treatments using the PEI and EBI indicators and obtained 347-363 and 335-355, respectively. The authors concluded that comparing characteristics of multiple broiler treatments (groups) is suitable for PEI and EBI in studying production and economic indices. For the presentation of the production efficiency of fattening, the EEI indicator is appropriate. The PEI and EBI values in this paper are within the margins achieved by the mentioned authors.

Table 3 shows the characteristics of broiler chicken carcasses based on cutting them into essential parts, and the market appraisal of broiler carcasses was carried out according to the portions of essential parts and the cost price (€) on the market.

Table 3. Portions of essential parts in broiler carcasses and their value (€)

Part of the carcass	Weight (g)	Portion (%)	€/part of the carcass
Breast	590.45	33.74	3.14
Drumstick and thigh	529.20	30.24	2.80
Back	436.45	24.94	1.16
Wings	193.50	11.08	1.64
Total	1750.00	100	8.74
Fillet	428.37	-	3.52

Figure 1 shows the market values of broilers according to the set goal of the research:

Placement of meat in carcasses, in parts of carcasses, or as a breast fillet in combination with other parts of the carcass.

Figure 1. Market values of carcasses and parts of carcasses (€)
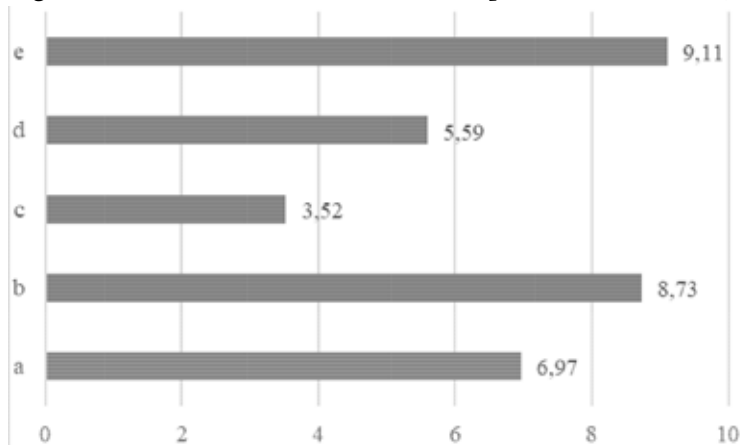
a - whole carcass; b - retail-cut carcass; c - breast fillet; d - parts of carcass without breast; e - c+d

For broiler producers, the third way of marketing broiler meat is the most cost-effective. However, in 50% of cases, consumers buy broilers as carcasses.

Some buyers purchase individual carcass parts according to their preferences (Petracci et al., 2015). According to the technological norms for Ross 308 broilers, carcass yield (dressing percentage, %) includes eviscerated carcasses without neck, legs, abdominal fat, and internal organs, as a percentage of live weight. The masses of eviscerated carcasses range from 69.5 to 73.3 %, with a live weight of 1.2 to 3 kg. The portions of breast fillet range from 17.9 to 27.2%, and drumsticks with thighs from 21.8 to 23.32% (Ross 308 manual, 2020). To compare the research results with technological norms, it was necessary to recalculate the characteristics of the carcasses according to the average live weight of broiler chickens. In this case, the carcass yield is 71%, the fillet proportion is 17.1%, and the drumsticks with thighs proportions are 21.2 %, which are approximate values given by the company AviaGen Ross 308 (2020) as the standard for that broiler hybrid.

3.4. Quality of meat of Ross 308 broilers

Table 4 shows the technological properties of broiler breast meat.

Table 4. Technological quality of breast broiler meat (n=20)

Indicator	X average	Indicator	X average
pH_1	6.18	CIE b*	7.98
pH_2	5.80	Drip loss (%)	2.03
CIE L*	55.35	Cooking loss (%)	19.70
CIE a*	1.20	WBSF (N)	31.56

The research results show that pH1 and pH2 values were suitable for the meat with normal properties. The CIE L* values are slightly higher than the recommended values (Soarez et al., 2009), which shows that breast meat is lighter in color. CIE a* values show a degree of yellowing, and CIE b* values show a degree of redness of the breast muscle. Drip loss (%) and cooking loss (%) were, on average, of normal values. The correlation between the color and pH value of the breast meat was explained by Anadon (2002) and Fletcher (1999). Variations in the color of the breast meat that is caused mainly by pH values affect the viability, smell, drip loss, cooking loss, and texture of the meat. Kralik et al. (2018) found that the pH1 value in breast meat ranges from 6.07 to 6.10, while the pH2 value ranges from 5.73 to 5.81. For the color of breast meat, the authors found the following indicators; CIE L* 53.83 to 55.35, CIE

a * 0.63 to 1.20, and CIE b* 7.44 to 7.98. The instrumental tenderness of the breast muscles was 31.56 to 37.91 WBSF(N), which are approximate values in the paper.

3.4. Appraisal of broiler meat for the market

Table 5 shows the market values of broiler chickens according to the production models A, B, and C.

Table 5. Value of broiler meat according to various preparations for the market

Description	A	B	C
Input (pcs)	500	500	500
Survival (%)	96	96	96
Output (pcs)	480	480	480
Output of carcasses (kg)	840	840	840
Value of broiler meat in the market (€/kg)	3.98	4.99	5.20
Total value	3 343.2	4 191.6	4 368
Annual value (6 rounds of fattening)	20 059.2	25 149.6	26 208
Indices	100	125.37	130.06

The annual revenues for each model were calculated based on the market value of broiler carcasses and individual parts of the carcass (Table 2). The market value of the breast fillet is shown separately. Breast meat is suitable for quick and easy cooking, which is desirable today in food preparation (Petracci et al., 2015), and the nutritional value is of the highest quality.

Table 6. Annual analytical calculation of broiler meat production

	Description*	A	B	C
1	Revenue (€)	20 059	25 149	26 208
	-costs			
	feed	9 072	9 072	9 072
	broilers	3 000	3 000	3 000
	other	4 100	5 100	6 100
2	Total	16 172	17 172	18 172
3	Financial results	3 877	7 977	8 036
4	Cost price (€/kg of carcass)	3.21	3.41	3.60
5	Cost-effectiveness (1/2)	1.24	1.46	1.44
6	Profitability % (3/1)	19.37	34.45	30.66

* Estimate for six rounds

Table 6 shows the annual analytical calculation of broiler meat production according to models A, B, and C. Revenues, costs, and economic indicators according to production models are presented. The analysis of models B and C shows that the revenue increased by 25.4% and 30.6%, respectively, compared to model A. The costs related to feed, buying day-old broiler chicks, salaries, depreciation of facilities and equipment, and others. The cost of producing broilers, according to models B and C, is higher by 6.2% and 12.4%, respectively, compared to model A. The calculation shows that for broiler carcasses in production models B and C, a higher price is achieved (€/kg) compared to model A (€4.99 and €5.20: €3.98), which affects cost-effectiveness (1.46 and 1.44: 1.24) and profitability (34.45% and 30.66%: 19.37%). The projection is based on a small-scale poultry farm (500 broilers, six rounds per year). The difference in the appraisal of broiler meat's market value according to the processing and preparation methods for the market is significant (€4890 and €6148.8, respectively) compared to the marketing of broiler meat in carcasses. Analysis of revenue and profitability of production is part of the analytics in current economic conditions. Profitability shows the ratio of profit and total revenue. Cost-effectiveness represents the ratio of total revenue and costs, and profitability represents the ratio of profit (loss) to total revenue (Karić, 2002). It should be taken into account that in the Republic of Croatia, there are rural areas with abandoned facilities, which can be made ready for broiler meat production with the necessary adaptations. Such low-capacity farms require little investment and can be operated by a workforce unsuitable for other types of work in agriculture. Some producers will be interested in producing broiler chickens on larger-capacity farms, enabling them to obtain a more significant revenue than the one estimated in this study. Feed consumption is the most essential factor in reducing production costs. Feed costs account for 55 to 70% of the total costs in broiler meat production (Aggrey et al., 2010). Improved feed use shortens the broiler fattening period and reduces production costs (Marcu et al., 2013). Food costs affect productivity and the cost-effectiveness of production.

The study included the EEI index, which shows the ratio of the cost of feed (€) and the weight of the broiler carcass (kg). In the paper, the EEI is 1.38, whereby the consumption of starter and finisher feed mixtures has been evaluated. When eating more food, broilers also achieve a higher weight, i.e., a better-dressed carcass yield, which affects the size of the EEI indicator. El-Tahaway et al. (2017) used Ross 308 broilers. They achieved in 35 days of fattening the fol-

lowing results: 1874 g of body weight, 3.81 kg of consumption, and 2.02 kg of feed conversion, with a mortality of 2%, which follows the results of Iqbal et al. (2012) and Rokonuzzman et al. (2015). Research done by Khalid et al. (2021) showed satisfactory production results for Ross 308 broilers. In 35 days of fattening, they achieved 2180 g of body weight and feed conversion of 1.41 kg, which corresponds to the data from this paper if the age of the broiler chickens in the fattening stage is considered. Hussein et al. (2014) state that the amount of food consumed and the final weight of the broilers are essential indicators in assessing economic efficiency and management. These indicators also affect the profitability of the production (Rochelle et al., 2012). Iqbal et al. (2012) argue that the most significant economic indicator is the ratio of the cost of feed to the achieved live weight (kg). This paper also states the excellent indicator for Croatian production conditions (€1.03/kg). Based on the determined portion of essential parts and cost prices on the market (Table 2), the market values of broiler carcasses (€8.73) and breast fillets (€3.52) were calculated. The research showed differences in profit per produced broiler concerning whether it is marketed as a whole carcass (€6.97), as retail cuts (€8.73), or as a breast fillet with the remaining parts of the carcass (€9.11). The research has shown that small producers and slaughterhouses should have suitable cutting and packing plants to achieve a higher level of processing and preparation of broilers for the market.

4. CONCLUSION

The paper presents the production characteristics of Ross 308 hybrids and the market value of broiler meat based on the processing and preparation of the broiler chickens for the market. The following models are presented: A – marketing as carcasses, B – marketing as retail cuts, and C – marketing as a breast fillet with other carcass parts. The production and economic indicators are presented using PEI (357), EBI (346), and EEI (1.38) values, which show the suitability of broiler hybrids for meat production. The highest market value of broiler meat is achieved when marketing the breast fillet with other parts of the carcass (€5.20/kg), followed by the retail-cut carcass (€4.99/kg). In contrast, the lowest market value is obtained when marketing broiler meat as whole carcasses (3.98€/kg). Higher market values are achieved by 25% and 30% if the B and C models are compared with model A of broiler meat production and sales. Cost-effectiveness coefficients were 1.46 and 1.44 for B and C models

and 1.24 for model A. The profitability rate in the same order was: 34.45% and 30.66%: 19.37%. The projection of broiler meat production according to models A, B, and C shows the possibility of successfully increasing the supply of quality animal products.

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THE CORRELATION OF GEOGRAPHICAL, DEMOGRAPHIC, AND ECONOMIC CHARACTERISTICS OF EUROPEAN COUNTRIES WITH THE MEDALS WON AT EUROPEAN AND WORLD TAEKWONDO CHAMPIONSHIPS AND OLYMPIC GAMES FROM 1992 TO 2021

Luka HORVAT
Faculty of Kinesiology University of Zagreb

E-mail: luka.horvat@student.kif.hr

Luka MILANOVIĆ, Ph.D.
Faculty of Kinesiology University of Zagreb

E-mail: luka.milanovic@kif.unizg.hr

Marijan JOZIĆ
University of Applied Sciences in Criminal Investigation and Public Security

E-mail: mjozic84@gmail.com

Abstract

This study aims to determine the impact of European countries' geographical, demographic, and economic characteristics on their success in taekwondo at the European and World Championships and the Olympic Games. The sample consists of 37 European countries that have won at least one medal in the largest taekwondo competitions in the world. The variables in this study are the total number of medals won (total medals), the area of the country in thousands of kilometers (country area), the number of inhabitants in millions (populations), and the gross domestic product (GDP). Collected data is processed by calculating the variables' basic statistical parameters, while the

Pearson correlation coefficient determines the correlation between variables. Statistical significance was set at p < 0.05.

Significant correlation values were obtained between variables: total medals and country area (r = 0.36), total medals and populations (r = 0.72), and between country area and population (r = 0.70). No statistically significant correlation was found between total medals and GDP per capita (r = -0.12).

The study found a correlation between population and medals won and between the area of the country and medals won. However, no correlation was found between GDP per capita and competition success. Therefore, we can conclude that the number of inhabitants and the area of the country affects success in world competitions, while GDP per capita does not affect success. Accordingly, more populous and enormous countries are at an advantage over smaller countries in population and area for competition success. However, according to the country's wealth, all countries have the same chance of winning a medal at world competitions.

Keywords: *Taekwondo, European countries, geographical, demographic and economic characteristics, medals*

JEL Classification: *Z20, Z29*

1. INTRODUCTION

Taekwondo is the most accessible martial art that merges the values of an ancient Asian tradition with the values of the global elite sport. Evolving by using traditional values of taekwondo, it improves already acquired modern values. The strengths of taekwondo and a powerful boost for gathering a significant number of children and youth are values taekwondoins recognize. The popularity and massiveness of taekwondo arise because this sport can be trained from early youth until an older age. Regular taekwondo training impacts taekwondoin's body improving his entire anthropological status (almost all motor abilities, explosive strength, speed of movement, coordination of entire body, flexibility, perception, required a high level of concentration), sport spirit and behavior (Lorger & Kruneš, 2016) of taekwondoins. According to Jozić (2001), taekwondo differs from other martial sports by its attractive, technically great foot kicks and high jump kicks and special systematic training, which determines safe and recognizable progress in taekwondo as a martial art. Entities who continually perform taekwondo training aiming at self-defense in critical situations

gain valuable self-confidence based on integral progress acquired through training; these facts enable them to defeat any attacker using their anthropological status. Through its modern way of training, taekwondo contributes to the so necessary development of a young man in motor, functional, and health senses.

Today's great popularity as a sport arises from taekwondo being practiced in 212 countries worldwide. In other words, the popularity of taekwondo increased in the last two decades when taekwondo became an Olympic sport (International Olympic Committee, 2010). The vision of the World Taekwondo Federation is "Taekwondo for everyone!" and their mission is the growth and international development of taekwondo, from the basic up to the professional level, in order to provide opportunities to train, compete, play, watch, and enjoy the sport, regardless of somebody's age, gender, religion, ethnicity or ability (worldtaekwondo.org/about-wt/about.html).

Nowadays, due to the growth of social standards, reduced working hours and increased time spent in leisure, general democratization, and highlighted commercialization, many areas of life are being widely opened, and the sport, here, taekwondo, is growing into a natural social phenomenon.

This combat sport offers the possibility to accomplish many social goals, which can be used to solve some social issues; it can be a potent initiator of many individual actions and transformations equivalent to different social events.

Owing to its competitive character, taekwondo is a potential tool of affirmation, and having this in mind, exciting to all individuals, groups, cultures, and social structures.

During interactions between this sport and its athletes, a whole chain of changes results in individual and societal growth. Sports presentations and their results at the most significant world competitions, such as Olympic Games and World and European Championships, are a quality factor of the participant and a reflection of his or her social and economic environment. Every great result achieved by taekwondo competitors is a product of the entire exceptionality of every individual but also a range of factors that provided conditions for the preparation of successful athletes.

As the first predictor and geographic attribute, the total area of the medal-winning country presented in square kilometers (km²) has been analyzed. (Worldometer, 2022). The number of inhabitants was chosen as a second pre-

dictor and macro indicator of the quantitative demographic state of a country (World Bank Group, 2022).

From an economic viewpoint, every sport stimulates general consumption and production, while top-level sports ongoings directly impact all economic fields, like the construction of sports facilities, production of sports equipment, food, medicine, and drugs, tourism, and marketing.

Many scientists, like Čustonja and Škorić (2011), observed economic attributes and their influence on success at Olympic Games. After observing success in boxing and related socioeconomic attributes, Tadić, Milanović, and Lukenda (2019) concluded that the number of inhabitants and country area are statistically significantly associated with success in boxing. Larger and more populated countries have a better chance to succeed in that sport. Also, they concluded that equal opportunities for winning medals in boxing exist in rich and poor countries. In water polo, Milanović and Babić (2019) concentrated their efforts on the European men's team and their success at Olympic Games and the European and World Championships from 1992 to 2018. It was determined that correlation is not statistically significant to the analyzed variables. The Olympic Games were studied by Petak (2007), who determined the degree of correlation between the number of inhabitants, total country area, and GDP per capita with the number of medals won from 1996 to 2016. However, only European countries were included in this research. He concluded that the percentage of medals won at Olympic Games was higher in the largest and the wealthiest countries. Gotal (2017) conducted a correlation analysis and concluded that several won medals at the World and European Football Championships statistically significantly correlated with the total number of inhabitants. However, no statistically significant correlation exists between the total number of won medals, country area, and GDP per capita. Krstičević, Petrović and Milanović (2018) compared the number of medals won in bowling with the geographical, economic, and demographic characteristics of the country. The European countries which were medal winners at World Championships were observed, and it was concluded that there is no statistically significant correlation between the total number of won medals and the number of inhabitants, total area, or GDP per capita of the country. It is essential to mention that research was conducted on a small sample of 14 countries and included one criteria variable only: the total number of medals won in men's competitions. Sinković, Sinković, and Milanović (2021) studied success in tennis and its correlation with economic,

geographic, and demographic attributes of Grand Slam tournament winner countries in individual competitions from 1992 to 2019. A correlation was detected between the number of inhabitants and the total number of won tournaments. However, the country's area and GDP did not significantly correlate with the total number of medals won at tournaments.

Following the primary mission, this paper aims to research the impact of geographical, demographic, and economic characteristics of European countries on their success at the European and World Championships and the Olympic Games and to determine if there are statistically significant correlations among country size, number of inhabitants and gross domestic product per capita with number of won medals at the biggest World Taekwondo Championships.

According to the aim of this paper, the tested hypotheses will be:

H1: A statistically significant correlation exists between the total number of medals won by the country from 1992 to 2021 and the country's area (in km²).

H2: A statistically significant correlation exists between the total number of state medals won from 1992 to 2021 and the number of inhabitants (in millions).

H3: A statistically significant correlation exists between the total number of medals won by a country from 1992 to 2021 and the country's GDP per capita (in US dollars).

2. METHODS

2.1. SAMPLE ENTITY

The sample consists of 37 European countries that won at least one medal at the European or World Championships or the Olympic Games, and data are presented in Table 1. Spain is the most prosperous country in Europe, with 202 medals won at major competitions. The second most successful is Turkey (173 medals), third is Russia (133 medals), fourth is France (118 medals), and fifth is Germany (92 medals). Switzerland has the highest GDP per capita, but with only 5 won medals, and the country with the largest area and the number of inhabitants is Russia, which won 133 medals.

Croatia ranked sixth, with 90 medals won. Of those medals, 20 are gold, 17 are silver, and 53 are bronze. Sixty-one medals were won at the European Championships (17 gold, 12 silver, 32 bronze), 24 medals were won at the World Championships (2 gold, five silver, 17 bronze), and five medals were won at the Olympic Games (1 gold and four bronze).

It is interesting to mention that in the upper third of Table 1, where the number of medals lists countries won at European and World Championships or Olympic Games, geographically prevail large and more populated countries such as Turkey, Russia, France, Spain, Germany, Italy, and Great Britain but without countries with a high level of GDP which is an indicator of the wealth of some country, for example, Turkey, Russia, Croatia, and Azerbaijan.

Table 1. List of all medal-winning countries according to the total number of won medals

	GOLD	SILVER	BRONZE	TOTAL MEDALS	GDP(*)	POPULATION IN MILLIONS	AREA IN THOUSANDS
SPAIN	63	59	80	202	27056.4	46.815915	505.992
TURKEY	51	57	65	173	8536.4	74.526	783.562
RUSSIA	34	38	61	133	10126.7	143.436145	17098.242
FRANCE	26	31	61	118	39037.1	64.300821	551.695
GERMANY	19	15	58	92	46252.7	80.219695	357.114
CROATIA	20	17	53	90	14132.5	4.284889	56.594
GREAT BRITAIN	25	18	37	80	41059.2	63.379787	242.900
ITALY	10	12	39	61	31770.0	59.433744	301.336
GREECE	12	16	29	57	17647.4	10.816286	131.990
AZERBAIJAN	13	14	29	56	4221.4	8.922447	86.600
NETHERLANDS	11	11	28	50	52396.0	16.655799	41.850
SWEDEN	4	10	30	44	52274.4	9.482855	450.295
DENMARK	8	10	15	33	61063.3	5.560628	43.094
SERBIA	6	8	14	28	7730.7	7.186862	88.361
BELARUS	4	1	18	23	6424.2	9.435251	207.600
POLAND	2	3	17	22	15742.5	38.044565	312.679
BELGIUM	6	1	12	19	45205.3	11.000638	30.528
UKRAINE	2	7	8	17	3724.9	48.240902	603.500
FINLAND	0	1	15	16	48755.4	5.533793	338.424
NORWAY	0	3	10	13	67329.7	4.979955	323.802
HUNGARY	1	2	7	10	15980.1	9.937628	93.028

PORTUGAL	3	1	6	10	22194.6	10.282306	92.090
SLOVENIA	0	3	7	10	25489.5	2.108977	20.273
AUSTRIA	1	2	6	9	48588.7	8.40194	83.871
ISRAEL	1	2	5	8	44177.6	7.41218	20.770
MOLDOVA	1	1	6	8	4547.1	2.805194	33.846
CYPRUS	0	0	6	6	27527.8	0.840407	9.251
SWITZERLAND	1	1	3	5	87100.4	8.035391	41.284
LATVIA	0	1	3	4	17736.5	1.893223	64.559
ARMENIA	1	1	1	3	4266.0	2.871771	29.743
BULGARIA	0	0	3	3	10079.2	7.36457	110.879
ROMANIA	0	1	2	3	12915.2	20.121641	238.391
BIH	0	2	0	2	6079.7	3.531159	51.209
MACEDONIA	0	1	1	2	5917.3	2.022547	25.713
CZECH REPUBLIC	0	0	1	1	22933.5	10.43656	78.865
IRELAND	0	0	1	1	85422.5	4.761865	70.273
ISLE OF MAN	1	0	0	1	86481.6	0.07856	0.572

(*) Gross domestic product per capita (GDP)
Source: https://www.taekwondodata.com/resultlist_select.html

Essential economic, geographic, and demographic variables considered significant for medal winnings at the highest taekwondo competitions were included as predictors. In this paper, observed variables are the total number of won medals (TOTAL MEDALS), the area of the country in thousands of square kilometers (AREA IN THOUSANDS), the number of inhabitants in millions (POPULATION IN MILLIONS), and the gross domestic product per capita (GDP).

The area of the country is the total territory of the country. It is expressed in square kilometers (worldpopulationreview.com). The country's number of inhabitants is the total number of inhabitants; in this paper, data from the UN (unstats.un.org) were taken. Gross domestic product per capita (GDP) is a generally accepted measure of the economic well-being of a country, expressed in US dollars per capita (Mankiw, 2006). This paper's data were taken from the World Bank (data.worldbank.org).

The research of this paper was divided into three phases. In the first phase, data on the number of medals won by countries at the European and World Championships and the Olympic Games from 1992. to 2021. were collected. In the second phase, geographical (area of the country), demographic (number

of inhabitants), and economic (gross domestic product per capita) data of all countries from the first phase were collected. The third phase of the paper consisted of processing all collected data and determining the correlation among the variables.

Statistical analysis and data processing were performed using Statistica for Windows ver. 14. The basic descriptive parameters were calculated, and the correlation of variables was observed by the Pearson correlation coefficient (r).

3. THE RESULTS

Table 2. – Descriptive statistics of all variables

	SAMPLE	ARIT. MEAN	MIN	MAX	S. D.
TOTAL MEDALS	37	38.19	1.00	202.00	50.13
AREA OF THE COUNTRY (km²/1000)	37	638.40	0.57	17098,24	2787.90
NUMBER OF INHABITANTS (in million	37	22.03	0.08	143.44	30.83
GDP (per capita in USD)	37	30484.42	3724.90	87100.40	24711.88

Legend – sample (S), arithmetic mean (arit. mean), minimum (min), maximum (max), standard deviation (S.D.).

Table 2 shows the data of descriptive statistics. It can be seen that, on average, 38.19 medals were won per country, the average area of the country is 638.40 (km²/1000), the average number of inhabitants is 22.03 million, and the average GDP per capita is 30484.42 US dollars.

Table 3. – Correlation analysis of all variables

VARIABLES	Marked correlations are statistically significant at the p < 0.05 N = 37 levels.			
	IN TOTAL	AREA OF THE COUNTRY	POPULATION	GDP
TOTAL MEDALS	1	**0.36***	**0.72***	-0.12
AREA OF THE COUNTRY		1	**0.70***	-0.15
POPULATION			1	-0.14
GDP				1

* - statistically significant (p < 0.05)
Legend – GDP – Gross Domestic Product

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Table 3 shows the correlation values between variables, and it is evident that there is a statistically significant correlation between total won medals and country area (r = 0.36) and between total won medals and number of inhabitants (r = 0.72). The correlation between the country's total area and the number of inhabitants is also visible and statistically significant (r = 0.70). Statistical significance was set at $p < 0.05$.

Following the goals and hypotheses of the paper, based on the listed correlation coefficients and their significance, it can be established that there is a statistically significant relationship between the total number of medals won by the country from 1992 to 2021 and the area of the country (in km²) (r = 0.36). Also, a statistically significant correlation exists between the total number of medals won by certain states from 1992. to 2021. and the total number of inhabitants (in millions) (r = 0.72). Unfortunately, a statistically significant correlation between the total number of medals won by a country from 1992. to 2021. Moreover, the country's GDP per capita (in US dollars) (r = -0.12) was not found (table 3).

It has been found that gross domestic product (GDP) is a variable that is not statistically significantly related to success in sports (r = -0.14) (table 3). Switzerland, Denmark, and the Netherlands have the highest GDP per capita but are not among the countries with the highest number of won medals. The only countries in which the GDP is above the average and in the first half of the ranking list according to their performance are Germany and Spain. According to economic characteristics, lower-ranked countries are Turkey, Russia, Croatia, and Azerbaijan. They occupy the second, third, sixth, and tenth places regarding the number of medals won, following the statement that a country's wealth does not statistically affect success in taekwondo (table 1).

4. DISCUSSION

It was determined that 1) the area of the particular country and the total number of inhabitants are statistically significantly correlated with achievements at the grand championships, expressed by the number of won medals in taekwondo, and 2) the correlation between gross domestic product per capita (GDP) of the particular country and total won medals has not reached the level that can be interpreted as statistically significant.

Obtained results can be interpreted as follows.

The reason for the correlation between the number of inhabitants and the total number of won medals (r = 0.72, table 3) can be explained by the fact that more populous countries provide a broader base of potential athletes, and thus more of those who train taekwondo and who could potentially reach the greatest taekwondo results at the international level.

Among the ten most prosperous countries, even seven have a population more significant than the average of all countries, and in the top five, all five are larger than average. Polland and Ukraine are the only countries that are more populated than the average, and they are not in the top ten most successful, but both are in the first half of the ranking list in terms of success (Polland – 16th place, Ukraine – 18th place) (table1).

In research on international success in tennis by Sinković, Sinković and Milanović (2021) and in football by Gotal (2017) statistically significant correlation was found with demographic traits, i.e., the number of inhabitants. Similar results were obtained by Ćaleta et al. (2021), who questioned the correlation between the number of medals won in athletics at the Olympic Games and World Championships and the total country area, number of inhabitants, and GDP per capita. They concluded that more populated and larger countries provide better resources for top athletes with the greatest chances of winning medals at world competitions.

According to the total number of won medals, Croatia holds the sixth place, but in absolute values, i.e.according to the number of inhabitants per one won the medal, Croatia is in the first place (table 1). The reason for this can be found in the tradition and popularity of taekwondo training in Croatia and its distribution all over the country. Therefore there is a broad base of athletes, so there is a greater opportunity to find better and more quality athletes. Many more populated countries do not have as outspread taekwondo clubs as Croatia does.

Finally, it can be concluded that in the more populated countries, the number of potential athletes particularly interested in taekwondo will be more significant. Leading countries, in this case, Spain, Turkey, Russia, France, Italy, and Azerbaijan, nurture their tradition and national sports, just like taekwondo.

The country's total size or area is statistically significantly correlated (table 3, r = 0.36) with achievements in great competitions. Countries such as Spain,

Turkey, France, Germany, Italy, and Great Britain that have a larger total area of the country than the average can be found here (table 1). The correlation is influenced most by Russia, which is 26 times larger than the countries' average. The correlation association is not so strong because countries smaller by area won an actual number of medals at great competitions. Croatia, with a total area smaller than 100 000 km2, is the most prosperous country in this segment. Along with Croatia in the first half of the list, and with an area lesser than 100,000 km², there are Azerbaijan, the Netherlands, Denmark, Serbia, and Belgium (table 1).

Compared with the research in other martial arts (Tadić, Milanović, and Lukenda, 2019), it was found that in both boxing and taekwondo, there is a statistically significant correlation between excellent performance and geographic characteristics, i.e., the total area of the country.

So far, all listed results lead us to conclude that more extensive and more populated countries have a more significant proportion of people systematically involved in sports. The abovementioned proves that countries have a broad base of athletes practicing taekwondo. From that base, by the pyramid system, top athletes will be profiled and probably some of them will be capable of accomplishing top sports achievements at the great competitions. Furthermore, all mentioned confirm that more populated countries have a broader base of athletes (in numbers).

The correlation of two factors, i.e., attributes of countries (demographic and geographic), was determined and expressed by several won medals in combat sports (boxing and taekwondo). Indeed, it would be interesting to check whether this correlation also exists in other Olympic martial sports (wrestling, judo, karate, and fencing). Correlation between gross national product per capita, GDP, economic attributes, and success at the world championships was not found (table 3).

Economically more robust, richer, and economically weaker, poorer countries have equal opportunity to win medals at the world championships. The top three countries ranked by the number of won medals (Spain, Turkey, and Russia) have GDP per capita below the average of all 37 countries in this research. In comparison, six of the top ten countries ranked below this average (table 1, table 2). We could say that taekwondo provides equal opportunities to succeed to all athletes, regardless of their rich or poor background. However,

the investments in taekwondo should be considered because those three countries invest in taekwondo through their associations with trainers, sports facilities, and athletes despite their GDP status being lower than the average. The wealthiest country is Switzerland which has taken five medals, and the poorest country according to GDP per capita is Ukraine, with 17 medals won (table 1).

Obtained results undoubtedly demonstrate no statistically significant correlation between the number of won medals and GDP per capita (in dollars) as a macroeconomic indicator of the economy. Mentioned results are the following results obtained by Krstičević, Petrović, and Milanović (2018), who determined that there is no relationship between GDP per capita and the number of medals won by European bowlers at the world championships from 1992 to 2017. The same conclusions were reached by Milanović and Babić (2019) in their research on medals won in water polo from 1992 to 2018 by European countries at the world championships. Gotal (2017), in her thesis, concluded that there is no statistically significant correlation between the winning medals of European countries and GDP per capita at the European and world football championships from 1930 to 2016. Even though mentioned research was conducted on the European countries, which participated in the greatest competitions, all listed reasons are following de Brosschera et al. (2006), who determined that it is not crucial how many financial resources are invested in sport system but its distribution within, all to achieve most excellent results and present these through nine columns of sports success. The weakness of this research arises from the fact that observed economic attributes do not reflect the actual state of investments in taekwondo. Some countries probably invest more resources in taekwondo but have lower GDP per capita. In order to analyze the actual state, we should have both budget data of all correlations and their ways of financing.

5. CONCLUSION

The primary goal of this paper was to determine the potential influence of geographic, demographic, and economic characteristics of European countries on success at the European World Championships and Olympic Games in taekwondo sport, that is, to determine their statistical significance.

The paper established a correlation between the number of inhabitants and won medals and between the country's total area and won medals. In contrast, the correlation between GDP per capita and competition achievements has not

been observed. Consequently, we can conclude that the number of inhabitants and the country's total area influence success at competitions, while GDP per capita does not. Accordingly, more populous and larger countries have an advantage over smaller countries in population and total area, i.e., to win the competition. However, according to the country's wealth, all countries have equal chances to succeed.

Finally, it seems that human resources for sustainable development of sports present a significant factor in the success of the country in combat sports, i.e., taekwondo on the international level. It implies that many athletes and experts of different educational levels and fields, with their knowledge and personality, could provide professional and quality treatment of participants in sport, herein in taekwondo. An essential component of financing top-level sports should be based on quality financing of that particular sport, here taekwondo, at local and global levels, which probably should strengthen the influence of economic factors on the greatest results in taekwondo.

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OVERVIEW OF EXPLOITATION FIELDS OF MINERAL RAW MATERIALS OF MEĐIMURJE COUNTY

Melita SRPAK, Ph.D.
Institute for Spatial Planning

E-mail: melita.srpak@gmail.com

Darko PAVLOVIĆ, Ph.D.
Plinacro d.o.o., Zagreb

E-mail: darko.pavlovic@plinacro.hr

Sanja KOVAČ, Ph.D.
University of Zagreb, Faculty of Geotechnical Engineering

E-mail: sanja.kovac@gfv.unizg.hr

Igor KLOPOTAN, Ph.D.
Međimurje Polytechnic in Čakovec

E-mail: igor.klopotan@mev.hr

Abstract

The exploitation of mineral raw materials is joint in Međimurje County, especially along the Mura and Drava rivers. The research goal is based on the research of spatial planning documents and studies that provide information on exploitation fields and exploration areas of mineral resources in Međimurje County. Deposits of mineral raw materials and exploitation fields of individual mineral raw materials are classified into energy mineral raw materials (hydrocarbons, coal, and geothermal water), brick clay, sand and gravel, and gold-bearing sand and gravel. The research results are based on previous knowledge about the exploration areas/exploitation fields and data obtained from the research, which were determined based on the resource base of mineral

raw materials, i.e., the mining-geological study. The mining-geological study defines the area where the exploration and exploitation of mineral resources are possible and serves as a basis for creating spatial plans in the part that deals with managing mineral resources.

In conclusion, we can state that unlike other types of development activities in Međimurje County, mineral raw materials can be planned and produced only in places where they exist because the locations for exploration and exploitation depend on the geological composition of the area. Deposits of mineral raw materials and exploitation fields of individual mineral raw materials depend on several spatial, resource, ecological, economic, and resource factors. This paper presents data on mineral resource management's spatial, resource, and development features in Međimurje County. In this paper, the authors will also elaborate on a list of currently active, planned, inactive, and deleted exploitation fields and exploration areas in Međimurje County concerning the territory of the Republic of Croatia.

Keywords: *exploitation fields, exploration areas, economy, mineral resources, Međimurje County*

JEL Classification: *Q53, Q59*

1. INTRODUCTION

The Međimurje County, bordered by Mura and Drava rivers, is in the extreme north of Croatia. The county covers an area of 730 km2 and is situated at the junction of two geomorphological units. The first unit consists of the Eastern Alps in the upper part of Međimurje, which is hilly, and the second unit is the Pannonian Plain in the lower part of Međimurje, which is flat (Posavec & Bačani, 2014).

Međimurje County is rich in history and cultural heritage and represents a complete and separate region. According to official statistical data and the population census from 2021, with 105,863 inhabitants (Croatian Bureau of Statistics, 2021), this spatially smallest Croatian county is one of the most densely populated in the Republic of Croatia. The county is administratively divided into 22 municipalities and three cities, with Čakovec being the administrative, cultural, and political center, as shown in Figure 1.

Figure 1. Administrative area of Međimurje County

Međimurje County represents a vital trade and transportation center that connects the countries of Central Europe (Hungary, Austria, Poland, Czech Republic). A modern highway connects the border crossing of Goričan with Hungary and the Adriatic Sea. The economy of Međimurje County is mainly based on the manufacturing industry, with developed agriculture, trade, and construction activities. In addition to the favorable geographical position and natural resources, the development of the economy is aided by a well-developed communal infrastructure. The natural resources available in the Međimurje region have been used for the development of agriculture (fertile soil), construction (gravel and sand), and energy (natural gas, geothermal water). The area of

lower Međimurje is naturally limited and consists of a unique hydrographic entity, which means that it is gently sloping towards the east and represents the space of alluvial valleys, precisely the direction of the main watercourses of the Mura and Drava rivers. (Posavec & Mustač, 2009).

Schmidt et al. (2008) and Ustaszewski et al. (2014) in their research emphasize that in geotectonic terms, the northern Croatian basin represents the southern and southwestern part of the Pannonian basin system consisting of a series of smaller, deep depressions, or basins, separated by relatively shallow rocks in which tuff deposits are located. The Mura and Drava rivers, which flow through the county's territory, provide significant hydroelectric potential, resulting in construction of two hydroelectric power plants. According to Bognar (1980), the hydraulic mechanism of the Drava River and its changes over time and space during the Holocene (tectonic influence, geological structure, composition, anthropogenic activities) have a decisive role in shaping the present relief features of the terrain. Unlike other types of developmental activities, mineral resources can only be exploited in places where they exist.

Geological features are conditioned by lithological structure and structural-tectonic relationships that have arisen in the past. According to Bognar (2008), from a geomorphological aspect, the following geotectonic units can be distinguished in the area of the Međimurje County: the Lendava Block in the north, the Međimurje Hills in the central part of the Međimurje County, the Mura Depression in the east, the Varaždin region in the southeast, and the Drava Depression in the south. The Mura Depression, which represents the western marginal part of the Pannonian Basin, was formed by the subsidence of the pre-Neogene basement that belongs to the eastern part of the Alps. The plains of the Drava and Mura depressions were shaped during the Pleistocene and Holocene by the work of rivers through erosion and accumulation processes. All of these investigations were the basis for the creation of the Basic Geological Map (OGK) M 1:100,000, which covered the sheets Čakovec (Mioč & Marković, 1998), Nađ Kanjiža (Marković & Mioč, 1988), Varaždin (Šimunić et al., 1982), and Koprivnica, along with their corresponding explanations. The Čakovec and Nađ Kanjža sheets cover almost the entire county (about 90%), while the Varaždin and Koprivnica sheets only cover the southernmost alluvial part along the Drava River.

The area of Međimurje County is composed of gravelly-sandy deposits that were deposited during the Holocene in vast terraces of the Drava and Mura rivers, forming the Quaternary aquifer complex. The thickness of these deposits varies, increasing from west to east. The thinnest layer is between Križovljani and Ormož. At the same time, the thickest deposits are located near Prelog (112 m), and in the deepest part of the Varaždin depression, they reach a maximum of 148 m. In the past, frequent floods, the strength of the river flow, and the accumulation of gravel and sand influenced the formation of river channels and the displacement of the river's course. The borders between countries have changed over the centuries but have remained on the old Drava riverbed. Dry riverbeds can be found in the southern area of Međimurje, especially between the Varaždin and Orehovica regions.

The most famous example of the relocation of settlements from one side to the other is the town of Legrad, which is now located south of the Drava, but in the past, it was on the north side. In addition to the published works of the mentioned authors, there are numerous unpublished works, such as reports on oil geological, biostratigraphic, and hydrogeological research, as well as research on coal, gravel, sand, and brick clays, which are kept in the archives of INA-Naftaplina Zagreb, Nafte-Lendava, the Geological Survey of Ljubljana, the Croatian Geological Institute, Croatian Waters, and other institutions.

2. ACTIVE EXPLOITATION FIELDS AND INVESTIGATION AREAS OF MINERAL RAW MATERIALS OF MEDJIMUR COUNTY

The sustainability paradigm has been widely accepted worldwide because it recognizes the interconnectedness of social, economic, and environmental systems. Sustainable development provides incentives and points to many aspects of a better quality of life in balancing the components of natural, social, economic, and political reality. In her work, Davoudi (2000) goes a step further, arguing that the versatility of the sustainability paradigm assumes a holistic and coherent approach to decision-making that complements environmental sustainability goals with those of social equality and economic prosperity. Based on this, the relationship between the environment and the developmental challenges of society is complex and poses a problem for institutions at the national and international levels (Blengini et al., 2012, 2017). Examining the spatial-economic

conditions in Međimurje County, the authors chose a qualitative methodology that can investigate even the smallest aspects of the social-economic situation while simultaneously can or cannot generalize its findings. The methods used in the study were: analysis of literature and planning documentation, interviews with numerous significant actors at all levels of the spatial-territorial organization, and participatory observation (field visits, conversations with "ordinary people," impressions, and data of various origins).

The subject and goal of this work are to shed light on the main spatial, developmental, economic, and structural trends and features that are of interest for designing the possibilities and directions of future spatial planning in Međimurje County. Since there are numerous spatial restrictions in Međimurje County and considering the consequences in the area that arise from the surface exploitation of gravel and sand, the available space suitable for exploiting mineral resources in the county remains limited. The fundamental legal document of the Republic of Croatia related to the exploitation of mineral resources is the Mining Act ("Official Gazette", no. 56/13, 52/18, and 98/19). According to the Law on Mining, regional self-government units must prepare mining geological studies for their areas, including existing and potential deposits of mineral resources, and follow the Mineral Resources Management Strategy (Dekanić et al., 2008). Međimurje County commissioned the development of the Resource Base of Mineral Resources in the Međimurje County area (Kruk et al., 2006), which serves as an expert basis for determining deposits, assumed stocks and possibilities of exploitation of all mineral resources in the Međimurje County area. It is a document that serves as a basis for determining and planning the exploitation of mineral resources in the county. Mining in the area of Međimurje has a long tradition, and the period from the 1920s to the 1970s was marked by coal mining. In Međimurje County, the mineral resources that are mainly exploited are construction sands, gravels, and brick clays. At the same time, the oldest deposits in the core of the Međimurje hills represent collector rocks of hydrocarbons and geothermal waters.

Deposits of sand and gravel are present along the courses of the Mura and Drava rivers. In the Mura River area, the gravel and sand deposits are significantly thinner and of poorer quality than those of the mineral resources in the Drava River area. Thus, larger exploitation fields are primarily located in the valley of the Drava River, a smaller part of the basin of rivers, and the smallest in the valley of the Mura River. Active exploitation fields in the Drava valley are

Kuršanski Lug, Galovo, Ivanovec, Poređe, and Cirkovljan. By exploiting sand and gravel along the rivers, water surfaces are formed. Abandoned deposits or parts of exploitation fields that are gradually being abandoned and closed must be remediated, and the area must be converted according to the current documentation, with an obligation to monitor the state of the environment (Strategic Environmental Impact Study of the Međimurje County Development Strategy until 2020, 2017). Given that the activities of exploration and exploitation of mineral resources are essential for the State, they are planned according to the regulations in the field of spatial planning by the State Spatial Development Plan. Until its adoption, these purposes are planned by the county spatial plans (Srpak et al., 2021).

3. RESULTS OF THE RESEARCH

Today, in Međimurje County, mineral raw materials are exploited exclusively for the construction, namely the exploitation of construction sand, gravel, and brick clay. In Međimurje County, the exploitation of mineral resources in 2023 is carried out in 2 cities (Čakovec and Prelog) and five municipalities (Šenkovec, Orehovica, Nedelišće; Mala Subotica, Domašinec). Međimurje County has 12 active exploitation fields of mineral raw materials: 2 exploitation fields of brick clay and ten exploitation fields of construction sand and gravel, and one wanted exploration area of construction sand and gravel.

Table 1. List of exploitation fields with the type of mineral raw material, solutions and concessions in Međimurje County

NO.	FIELD NAME	NAME OF AUTHORIZED ENTITY	LGU (Town/municipality)	TYPE OF MINERAL RESOURCE	AREA OF THE FIELD (ha)	VALIDITY PERIOD OF THE DECISION	CONCESSION
				EXPLOITATION FIELDS OF MEDJIMUR COUNTY			
1.	Šenkovec EF	Eko Međimurje d.d.	Općina Šenkovec	Brick clay	41.96	25.06.1982-31.12.2048	30.06.2020-31.12.2034
2.	Šenkovec EF	Eko Međimurje d.d.	Općina Šenkovec	Brick clay	41.96	25.06.1982-31.12.2048	30.06.2020-31.12.2034
				TOTAL:	**83.92**		
1.	Ivanovec EF	Tegra d.o.o.	Orehovica	Construction sand and gravel	92.02	16.11.1984-31.12.2056	15.01.2021-31.12.2055
2.	Kuršanski Lug-Poleve EF	Međimurje Tegra d.d.	Nedelišće	Construction sand and gravel	13.53	24.09.1981-31.12.2035	18.09.2019-31.12.2035
3.	Prodi EF	Carović Plus d.o.o.	Čakovec	Construction sand and gravel	13.51	19.06.2007-31.12.2040	09.08.2019-31.12.2035
4.	Galovo EF	Betaplast d.o.o.	Čakovec	Construction sand and gravel	12.07	04.04.1995-31.12.2036	18.04.2006-31.12.2031
5.	Poredje EF	Eurobeton d.d.	Prelog	Construction sand and gravel	29.29	16.11.1984-31.12.2036	20.07.2018-31.12.2023
6.	Cirkovljan EF	Tegra d.o.o.	Prelog	Construction sand and gravel	45.14	25.12.1981-31.12.2051	05.05.2020-31.12.2051
7.	Držimurec-Strelec EF	Pavlic-asfalt-beton d.o.o.	Mala Subotica	Construction sand and gravel	6.34	16.07.2002.-31.12.2025.	
8.	Turčišće EF	Međimurje TEGRA d.d.	Domašinec	Construction sand and gravel	22.95	13.04.1972-31.12.2058	26.09.2022.-31.12.2045.
9.	Turčišće II EF	Quadro d.o.o.	Domašinec	Construction sand and gravel	12.78	16.11.1997-31.12.2048	08.04.2022.-31.12.2027.
10.	Turčišće-I EF	David & Company d.o.o.	Domašinec	Construction sand and gravel	12.78	11.03.1998-31.12.2052	30.11.2020-31.12.2050
				TOTAL	**260.41**		

Source: Data processed by the author based on the Ministry of Economy and Sustainable Development data, 2023.

Table 1 shows a list of exploitation fields with Decisions on the determination of exploitation fields and Concession Agreements for the exploitation of mineral raw materials. In contrast, Table 2 shows a list of requested exploration areas in Međimurje County, which is 11.65 ha. According to the data in Table 2, it can be seen that the total area of active exploitation fields of construction sand and gravel in Međimurje County is 260.41 ha, and brick clay is 83.92 ha, so their total area is 344.33 ha.

Table 2. List of requested exploration areas with the type of mineral raw material in the area of Međimurje County

WANTED INVESTIGATION AREAS OF MEDJIMURAN COUNTY						
NO.	FIELD NAME	NAME OF AUTHORIZED ENTITY	LGU (Town/ municipality)	TYPE OF MINERAL RAW MATERIAL	AREA OF THE FIELD (Ha)	DECISION VALIDITY PERIOD
1.	Galovo1		Čakovec	Construction sand and gravel	11.65	
	TOTAL:	**11.65**				

Source: Data processed by the author based on the Ministry of Economy and Sustainable Development data, 2023.

According to the data of the Ministry of Economy and Sustainable Development, Mining Administration, there is one inactive exploitation field of construction sand and gravel (EP Verk-Zavrtje) with a total area of 12.51 ha in Međimurje County (Table 3).

Table 3. Inactive mining fields in Međimurje County

INACTIVE EXPLOITATION FIELDS IN THE AREA OF KOPRIVNICA-KRIŽEVCI COUNTY							
NO.	FIELD NAME	NAME OF AUTHORIZED ENTITY	LGU (Town/ municipality)	STATUS	TYPE OF MINERAL RAW MATERIAL	AREA OF THE FIELD (Ha)	DECISION VALIDITY PERIOD
1.	Verk-Zavrtje EF	Republika Hrvatska	Mursko Središće	Inactive	Construction sand and gravel	12.51	07.11.1995 - 30.04.2021
	TOTAL:	**12.51**					

Source: Data processed by the author based on the Ministry of Economy and Sustainable Development data, 2023.

4. DELETED EXPLOITATION FIELDS OF MINERAL RAW MATERIALS OF MEDJIMUR COUNTY

According to the Law on Mining, a mining business entity is responsible for damage to nature and the environment caused by the performance of mining works on the exploitation field and is obliged to carry out the following:

- Rehabilitation of the area where the mining works were carried out

- Insurance measures to prevent danger to people, property, nature, and the environment, and report this to the mining inspection and the environmental protection inspection, which issue certificates on the implementation of the mentioned measures, after which the concession grantor issues a decision on the deletion of the mining economic entity as the authorized exploitation field form of the register of exploitation fields, and can issue a decision on deleting the exploitation field from the register of exploitation fields.

In Međimurje County, five exploitation fields (coal) were registered, which were deleted from the Register of exploitation fields. The total area of cleared exploitation fields was 1,0569.7 ha shown in Table 4.

Table 4. Exploitation fields in Međimurje County were cleared

DELETED EXPLOITATION FIELDS IN THE AREA MEDJIMUR COUNTY							
No.	FIELD NAME	NAME OF AUTHORIZED ENTITY	LGU (Town/ municipality)	STATUS	TYPE OF MINERAL RAW MATERIAL	AREA OF THE FIELD (Ha)	DECISION VALIDITY PERIOD
1.	Štrukovec EF	Međimurski Ugljenokopi, Mursko Središće	Mursko Središće, Selnica, Vratišinec, Čakovec, Sveti Juraj Na Bregu	Deleted	Coal	675	18.03.1966 - 16.11.1970
2.	Novi Dvori EF	Međimurski Ugljenokopi, Mursko Središće	Mursko Središće	Deleted	Coal	404.98	06.09.1960 - 29.05.1967
3.	Hrastinka EF	Međimurski Ugljenokopi, Mursko Središće	Mursko Središće	Deleted	Coal	76.87	06.09.1960 - 17.11.1970
4.	Peklenica EF	Republic of Croatia	Mursko Središće	Deleted	Coal	73.15	06.09.1960 - 03.09.2018
5.	Pobjeda EF	Međimurski Ugljenokopi, Mursko Središće	Mursko Središće, Podturen, Vratišinec	Deleted	Coal	339.7	06.09.1960 - 24.07.1973
	TOTAL:	1.0569.7					

Source: Data processed by the author based on the Ministry of Economy and Sustainable Development data, 2023.

According to the Spatial Plan of the Međimurje County, specifically the Purified Text of the provisions for the implementation of the Spatial Plan of the Međimurje County (Official Gazette of the Međimurje County no. 12/19), the exploitation of mineral resources is possible in locations marked on the cartographic display number 1 - Use and Purpose of Space/Areas, and its implementation is prescribed by articles 39-45. Permits, approvals, and concessions for exploration and exploitation of mineral resources, as well as prescribed procedures for assessing the impact on the environment and nature, and the information system on exploration and exploitation of mineral resources are coordinated by state authorities responsible for mining, spatial planning, environmental protection, and nature conservation in the prescribed manner (Srpak & Pavlović, 2020).

5. SANITATION OF THE SPACE AFTER THE TERMINATION OF THE EXPLOITATION OF RAW MINERAL MATERIALS

Mining activities have a significant and long-lasting impact on the environment even after the exploitation of mineral resources has ended. Therefore, to minimize this impact, it is necessary to carry out technical reclamation (sanitation) of the mine or an acceptable form of conversion. When designing future use, the duration of exploitation must not be overlooked, as the use of mining fields lasts for decades (Srpak, 2022). Per the spatial planning documentation, surface mining conversion essentially involves specific technical measures to redesign the excavated areas and waste disposal sites after exploitation has ended. Mesec (2009) states that the use of space after the cessation of mineral resource exploitation can be diverse, including economic, agricultural, tourism, sports, and recreational activities. The type of activity the excavated area will be designated for after exploitation depends on its size, appearance, location, distance from urban, agricultural, forest, sea or river areas, traffic routes, etc. Abandoned gravel pits or parts of mining fields that are gradually abandoned and closed in Međimurje County need to be reclaimed and converted according to the prepared documentation (according to the reclamation project) but with an obligation to monitor them. To use mining fields for their intended activities or purposes after excavation, they must be technically reclaimed beforehand. New exploitation technologies allow for faster and easier exploitation of resources and accelerate and reduce the cost of their processing (Bruel & Delmar, 1993).

The selection of the appropriate remediation model should not only consider the ecological component but also create prerequisites for future development of the wider area affected by former mining activities. Projects usually rely on technical remediation methods (established by mining projects) that ensure the stability of the terrain, along with proposals for biological restoration. Often, the primary focus is on researching and implementing planting methods and species of native plants that can contribute to soil stabilization and revitalization of forest communities (Pranjić & Mesec, 1992; Perić et al., 2009).

Mining and environmental protection regulations adequately regulate issues related to the remediation and reclamation of areas after mining activities. However, in practice, they are not effectively and visibly implemented. Surface mines are generally open and highly dynamic systems that have arisen due to the influence of many technical, economic, and ecological factors and limitations in all stages of their development. Dimitrijević (2014; 2015) researched surface mines in the pre-exploitation, exploitation, and post-exploitation phases. It is assumed that there is a discrepancy in the relationships between regulations (mining, spatial planning, environmental protection), administrative bodies (mining, spatial planning, environmental protection), mining project planners, mining concession holders, and inspection services (mining and environmental protection). Without coordination of each subject's actions within their jurisdiction area, there is no positive effect or functioning of the entire system. The framework for sustainable management of mineral resources primarily focuses on improving the efficiency of mining activities to reduce their environmental impact while also considering social and economic impacts (Gorman & Dzombak, 2018). It is important to note that in strategic decision-making regarding the management of mineral resources, knowledge of geological potentials, spatial planning conditions, and limitations related to the protection of nature, water, soil, landscape, cultural heritage, and the role of socially sustainable indicators should be integrated (Hale et al., 2019).

6. CONCLUSION

Mineral resources represent a natural resource of interest for the Republic of Croatia and can only be exploited under the conditions and in the manner prescribed by the Mining Act. Currently, mineral resources with exclusive use in construction are being exploited in Međimurje County: the exploitation of

construction sand and gravel and brick clay based on permits, resolutions of the competent authority on exploration areas and exploitation fields, or awarded concessions for exploitation, following mining regulations. Given the numerous spatial limitations in Međimurje County and considering the spatial consequences of surface exploitation of gravel and sand, the available space for mineral resource exploitation in the county remains limited. In analyzing the state of exploitation of mineral resources in the environmental, spatial, and infrastructure areas, one of the developmental problems in the exploitation of mineral resources in Međimurje County is the underdevelopment of production with higher added value that uses mineral resources as inputs. The demand for specific mineral resources is increasing rapidly in the Republic of Croatia and Međimurje County. However, natural, technological, legal, and social conditions can significantly limit capacities. In addition to qualified personnel and social support, modern technology is one of the critical success factors to achieve this. It should also be emphasized that mining activities have a significant and long-term impact on the environment, even after the exploitation of mineral resources is completed, so it is necessary to carry out technical regulation (sanitation) of the mine or an acceptable form of conversion, to reduce this impact to a minimum.

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MARKETING MANAGEMENT

EFOS

CHOCOLATE PACKAGING IN A CIRCULAR ECONOMY: INVESTIGATING THE CONSUMER PERCEPTION, PURCHASE AND RECYCLING INTENTION WITH REGARDS TO THE GERMAN CHOCOLATE INDUSTRY

Niklas SCHUPPLER
Pforzheim University, Business School

E-mail: niklasschuppler@icloud.com

Kai Alexander SALDSIEDER, Ph.D.
Pforzheim University, Business School

E-mail: kai.saldsieder@hs-pforzheim.de

Abstract

Pollution of nature by plastic waste is one of the most significant challenges for environmental protection. Industrial plastics account for most of this pollution. Most of it is packaging for consumer goods.

One of the solutions to prevent increasing pollution is to introduce circular economy systems in industrial production. Sustainable product design and increasing the share of recycled materials in production are currently under discussion.

However, without a corresponding consumer demand, these approaches come to nothing.

Against this background, this study analyses the consumer behavior of Generation Z towards confectionery, which represents a broader part of the FMCG food category, intending to identify concrete starting points for the targeted design of sustainable packaging.

The study is based on six hypotheses derived from a comprehensive literature review and subsequently tested utilizing a quantitative, semi-standardized online survey (n=215) using SPSS-based regression analysis. The results provide information on the importance of sustainable packaging design for product selection, willingness to pay, and willingness to recycle packaging after consumption in a circular economy actively.

To assess the influence of the environmental awareness of young, environmentally conscious consumers on their intention to buy chocolate in recycled packaging, a consumer EAS (Environmental Awareness Score) was calculated.

With the result, the study offers practical insights for product managers of confectionery manufacturers.

The results show a clear correlation between environmental and recycling behavior and young consumers' identification with sustainable packaging, purchase intention (PI), and recycling intention regarding circular economy theory. Furthermore, the study shows that Generation Z consumers are willing to accept a significant price premium if confectionery is offered with sustainable packaging. Thus, the study provides important insights for creating a potential demand for more environmentally friendly packaging of consumer goods.

1. INTRODUCTION

Plastic waste is one of the major environmental issues worldwide (Zasche, 2018). The continuously growing world population (Rudnicka, 2022) and economic output result in a future challenge of extracting too many natural and rare resources (Umweltbundesamt, 2019). The extraction and processing of these resources not only contribute to the depletion of the supplies but also causes other environmental problems, such as limited availability, resulting in the loss of biodiversity and desertification of agricultural land (Umweltbundesamt, 2019).

The outlined problems are particularly acute in the Fast Moving Consumer Goods (FMCG) sector as businesses that are not obliged to avoid waste do not do so. Therefore, the "Deutsche Umwelthilfe" suggests implementing a waste

avoidance target and introducing a plastic tax (Norddeutscher Rundfunk, 2021).

One of the solutions to prevent increasing pollution is the introduction of circular economy (CE) systems in industrial production (Oke et al., 2020). According to Lewis (2022), a CE can be characterized by three key elements: (1) Elimination of pollution and waste, (2) Circularity of products and materials, and (3) Regeneration of nature. The main objective is to extend the product life cycle through its properties and recycling. With growing concerns about climate change, environmental damage, and the finiteness of nonrenewable resources, sustainability has gained consumers' awareness (Magnier et al., 2016). It has become a key influencing factor in human behavior (Meffert & Bruhn, 2012: 5). To make products more environmentally friendly, manufacturers can either change the intrinsic attributes (ISO, 2008) or the extrinsic attributes of the product (Hodgkins et al., 2015). In the following paper, the focus lies on chocolate packaging (extrinsic attributes) in Germany.

To understand the impact of circular chocolate packaging on the purchase and recycling intention in the German chocolate industry, the following problem statement can be stated: *"How do Gen Zers perceive a Circular Economy, do they intend to purchase chocolate in circular packaging and will they recycle the packaging afterward?"* Since there is a lack of research regarding the consumer's perception of circular chocolate packaging, this study aims to investigate the consumer's acceptance and willingness to purchase chocolate in circular packaging (CP).

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

2.1. Consumer Behavior Towards Sustainable Packaging

Packaging is one of the most important external stimuli influencing consumers' perceptions, sympathy, and decision-making (Pramudya & Seo, 2019; Towers, 2014: 107). Authors have explored different aspects of consumer attitudes related to sustainable food packaging. A particular focus is placed on the model by Ketelsen et al. (2020), adapted from Grunert and Wills (2007) and Grunert (2011). The framework shown in Figure 1 depicts the different processes in a consumer's mind when being exposed to the stimuli of eco-friendly

packaging and before reacting to these stimuli (Ketelsen et al., 2020; Towers, 2014, p. 107).

Figure 1. Consumers' response to environmentally-friendly food packaging – a conceptual framework.
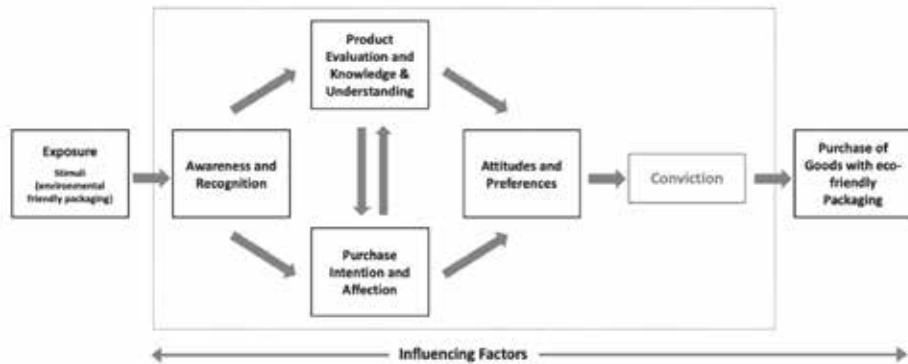
Source: Adapted from Ketelsen et al., 2020; Grunert & Wills, 2007; Grunert, 2011.

The model assumes that eco-friendly packaging can only lead to a behavioral reaction when consumers are aware of and recognize this type of packaging: (1) Exposure stage, (2) Consumer's awareness and recognition, (3) Product evaluation, knowledge and understanding, the PI and affection of environmentally-friendly packaging, (4) Preference for and attitude towards, (5) Conviction and (6) Purchase of environmentally-friendly packaging (Ketelsen et al., 2020 adapted from Grunert & Wills, 2007; Grunert, 2011).

(1) **Exposure** is when the consumer physically contacts a stimulus. In this context, exposure refers to how the respondent was unveiled to environmentally-friendly packaging.

According to Venter et al. (2011), Steenis et al. (2017), and Banterle et al. (2012), consumers are (2) **aware** of and **recognize** the environmental impact of grocery packaging. Humans are interested in having information about sustainability, recyclability, and reusability of packaging at the point of sale (POS) (Banterle et al., 2012). Logos, labels, and packaging material are the most important attributes for consumers when identifying environmentally-friendly packaging (Ketelsen et al., 2020). In particular, cream, green and brown is associated with eco-friendly packaging (Scott & Vigar-Ellis, 2014). Besides the reduction of over-packaging, consumers demand an appropriate size, eco-labels,

and information about waste sorting as well as recyclability (Lindh et al., 2016; Magnier & Crié, 2015).

(3) **Knowledge** and **understanding** are a significant part of the FMCGs evaluation (Lee & Lee, 2011; Rao, 1988). Crucial aspects relating to the origin of materials, the ecological costs of production, transport, and distribution are often neglected in consumers evaluations (Boz et al., 2020; Herbes et al., 2018; Herbes et al., 2020; Magnier & Crié, 2015; Steenis, 2019).

Hence, product and packaging evaluation is fundamental in the product development process. It is essential to understand how consumers evaluate the product and its packaging, including the packaging materials and aesthetics such as shape, style, colors, and graphics (Research America, n.d.).

The characteristics of whether the packaging is eco-friendly or not are often associated with the disposal of it. The focus is mainly on the end-of-life properties of the packaging, with less emphasis on attributes like renewable or recycled materials and the production process (Herbes et al., 2018). The knowledge and understanding of consumers about the environmental impact of packaging compared to actual life cycle assessments are not congruent. As a result, consumers make impressionable, inefficient environmental decisions (Steenis et al., 2017). Therefore, it is hypothesized:

H1: When Gen Zers are exposed to different types of chocolate packaging, they can identify the most sustainable one.

Product packaging can also be influenced by the perception of intrinsic quality, such as taste (Haas, 2018). Product attitudes are formed through the packaging design, whereby the perceived product benefits are generally determinants of consumers' attitudes toward the product (Ajzen, 1991; Magnier & Schoormans, 2015; Steenis et al., 2017). Positive emotions induced by packaging are influenced by the perceived advantages of the packaging (Koenig-Lewis et al., 2014; Sijtsema et al., 2016). Negative emotions arise when humans are uncertain about the environmental benefits of the packaging and perceive it as a marketing trick (ibid.). However, the effect of positive emotions on PI is more significant than the one of negative emotions. In this respect, environmental awareness is a primary determinant in predicting the PI of eco-friendly packaging (Magnier et al., 2016; Paul et al., 2016; Yadav & Pathak, 2016). Therefore, it is hypothesized:

H2: The higher the level of environmental awareness of pro-environmental Gen Zers, the more likely they will purchase chocolate in circular packaging.

Ketelsen et al. (2020) consider other product attributes, such as eco-friendliness of the packaging, as essential for (4) **preference** and **attitude** towards a product. Environmental protection and the well-being of fellow humans are perceived as the main advantages of eco-friendly packaging. In contrast, personal benefits such as health-related advantages, emotional value, convenience, and price reduction are not seen as primary benefits due to a reduction in the amount of packaging material. For consumers, sustainable packaging entails price increases and reduced convenience, leading to less pleasant consumption. Other perceived inconveniences of eco-friendly packaging include a decline in aesthetics, product protection, and efficiency (Magnier & Crié, 2015). Overall, products in eco-friendly packaging are considered more natural, healthier, and, therefore, products with better quality (Magnier et al., 2016).

(5) **Conviction** of consumers can be assessed using the concepts of willingness to buy and willingness to pay (WTP). Magnier and Schormans (2015) state that the appearance of sustainable packaging positively influences consumers during their buying behavior. Consumers will purchase a different product if it has sustainable packaging (Jerzyk, 2016) and are willing to pay a higher price for it (Lindh et al., 2016). Therefore, it is hypothesized:

H3: The higher the level of environmental awareness of pro-environmental Gen Zers, the more they are willing to pay for chocolate in circular packaging.

Information about the (6) **purchase of products in environmentally-friendly packaging** is derived from information consumers provide about their attitudes and actions. According to Ketelsen et al. (2020), it does not provide information about their correct behavior. For behavioral science, it is essential to know how strong the cognitive control of the decision-makers is. It expresses the extent to which information search and processing determine the purchase decision (Kuß, 1991: 24). Impulse purchase decisions can be described as a buying behavior with low cognitive control. It is unplanned and results from an instantaneous decision, usually made at the POS (Schulz, 1972: 31). Their purchase involves low financial and social risk and can be triggered at the POS (Weinberg, 1981: 161). Chocolate is a low-involvement product for which con-

sumers frequently use pieces of information as quality cues to make judgments about other product characteristics (Wansink, 2003).

2.2. Factors Influencing the Purchase of Products in Eco-friendly Packaging

Environmental concerns are essential in shaping consumer mindsets and influencing purchasing choices (Trivedi et al., 2018). Schwartz and Howard (1981) describe this concern as a feeling of urgency that initiates the activation of several sequential and repetitive stages, such as **attention**, **motivation**, **evaluation,** and **defense**, through which an individual seeks affirmation to activate a particular behavior such as the purchase of products with CP.

Social factors such as family, reference groups, role, and status also influence the behavior of consumers. Individuals try to imitate other humans and want to be socially accepted, which means every human being is influenced in their buying decisions (Perreau, 2014). In this context, the involvement of consumers regarding pro-environmental beliefs (environmental activism) is also a predictor of responsible consumer behavior (Khare, 2015). Hence, the characteristics and associated environmental benefits of recyclable packaging are not always prominent. Consumers who intend to behave eco-friendly may need further information to make coherent purchasing decisions (Khare, 2015). Consequently, sustainable behavior has a direct effect on the likelihood of purchasing CP and an indirect effect mediated by acquiring further environmental information.

Knowledge and **information** profoundly raise consumer awareness and make purchasing choices consistent with personal beliefs and norms. While **social norms** should not be forgotten because people will identify with sustainability or state that they will purchase products in sustainable packaging if confronted in a group setting (McLeod, 2008).

According to the theory of planned behavior by Ajzen (1991), information is one of the factors that can affect the strength of control beliefs. However, nowadays, consumers are bombarded with technical information. As a result, it is essential to develop the ability to filter and understand the information needed for their decision-making. Consumers' willingness to seek additional information about the environmental attributes of packaging may be essential for understanding the ecological advantages of recyclable packaging, which are

not always immediately noticed (Shao, 2019). Since these aspects significantly impact consumer response to sustainable packaging, they must be considered when creating marketing strategies (Perreau, 2014).

2.3. Recycling Behavior

The disposal of chocolate packaging involves both primary packaging, which is in direct contact with the product, and secondary packaging, which holds the individual units together. Both packagings should align with consumer needs regardless of function (Miah et al., 2017). This study does not consider packaging for other sections of the supply chain (e.g., transport). Chocolate is usually consumed in its entirety. Depending on the type of product (e.g., single chocolate bars), the packaging is disposed of before consumption.

Tonglet et al. (2004) illustrate that awareness of well-documented recycling benefits, such as conserving natural resources, significantly predicts positive attitudes toward recycling. Awareness of recycling leads to a positive attitude toward recycling (Ramayah et al., 2012), indicating that individuals with a positive attitude toward recycling are more likely to recycle (Derksen & Gartell, 1993). Consumers with positive attitudes towards ecology and environmental protection shared a more significant burden for recycling (Meneses & Palacio, 2005). However, subjects who do not care about the environment also achieved high recycling rates (Derksen & Gartrell, 1993: 439). Therefore, it is hypothesized:

H4: Positive attitudes of Gen Zers towards recycling influence the intention to recycle circular chocolate packaging.

Informing consumers about the advantages of recycling is an important strategy in forming and shaping their attitudes (Vicente & Reis, 2008). Studies by De Young (1989), Oskamp et al. (1998), as well as Schultz et al. (1995) have found that knowledge about recycling is a significant factor in explaining recycling behavior and their willingness to participate in a recycling pattern. Therefore, it is hypothesized as no previous research analyses the PI regarding Gen Z's recycling knowledge and information in the chocolate industry:

H5: Gen Zers who have knowledge and information about recycling are more likely to have the intention to purchase chocolate in circular packaging.

In addition to campaigns, an increasing number of legislative frameworks are created to reduce the waste impact on the environment. The most used ap-

proach to the problem is the 3 R's method: Reduce, Recycle, Reuse (Disposal & Recycling Inc., 2018). Wever et al. (2010) state that consumers intending to buy eco-friendly packaging dispose of the package in an environmentally-friendly way. Suppose a package is kept to be re-used to avoid throwing away a valuable item or keeping the item to convert it to serve another purpose. The behavior is considered green (Stern, 2000). Therefore, it is hypothesized:

H6: Gen Zers who intend to buy chocolate in circular packaging intend to recycle the packaging.

Understanding and engaging consumers is crucial during transitioning to a CE to implement targeted marketing strategies that promote environmentally conscious purchases and proper packaging disposal (Grin et al., 2010). This study extends the understanding of environmentally conscious consumer behavior by examining the influence of personal concern, pro-environmental behaviors, product packaging evaluation, PI, and disposal behavior of recyclable packaging. In summary, Figure 2 illustrates the hypothesized relationships.

Figure 2. Research Model
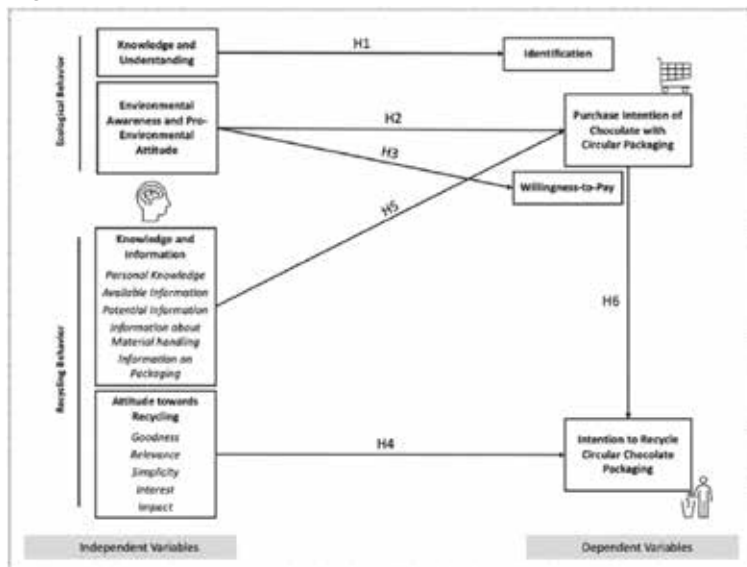
Source: Adapted from Ketelsen et al., 2020; Grunert & Wills, 2007; Grunert, 2011.

3. RESEARCH DESIGN, DATA COLLECTION, AND SAMPLING

Gen Zers, young consumers aged between 16 and 30 years, represent tomorrow's purchasing power and are essential for chocolate manufacturers to launch products with CP. The hypotheses illustrated in the Research Model were tested in quantitative analyses. The online survey tool Unipark by Questback was used for the data collection. The online questionnaire provided a cost-effective, flexible, and time-efficient data collection method with high data accuracy and quality (Albers et al., 2009: 52; Burns et al., 2017: 189), low interviewer bias (Albers et al., 2009: 54) and suitability for studying Gen Zers. All answers were recorded anonymously. To avoid sequence effects, questions were randomized.

The measurement of various variables is rooted in previous literature adapted for this study's cause. A five-point Likert scale was used to ensure a homogenous structure of the survey. EAS, recycling knowledge and information, and attitude towards recycling consist of multi-item scales which capture complex constructs better than single-item scales and can be summarized as one variable (Kuß et al., 2018: 100).

Non-probability sampling methods were applied to recruit participants, particularly convenience and snowball sampling. The advantage of being time and cost-effective comes with the disadvantage of the sample not being representative of the German population (Burns et al., 2017: 253).

4. QUANTITATIVE RESEARCH RESULTS

Profiling the final sample of 215 respondents, the age of the subjects varies between 16 and 30 years, with an average age of 22.6 years. All quantitative methods used in the quantitative research study fulfilled their required background checks. Constructs were formed using principal component analyses with the items listed in the Appendix. The Kaiser-Meyer-Olkin (KMO) criterion and Bartlett's test of sphericity were utilized to ensure the adequacy of the samples and items for factor analyses. All dimensions' KMO values were equal to or greater than 0.5, and Bartlett's test of sphericity yielded results with $p < 0.05$ for all analyses, indicating good item correlations (Cleff, 2015). All constructs' Cronbach's alphas, assessing the internal consistency of the item sets,

exceeded 0.6, demonstrating adequacy (Malhotra, 2020: 303). A significance level of α = 0.05 was applied to all analyses.

4.1. Identification of Sustainable Packaging

In order to find out whether Gen Zers can identify the most sustainable packaging when they are exposed to different types of chocolate packaging (H1), a frequency table was created. In general, 94 percent recognized the most sustainable chocolate packaging (grass paper packaging). 75.8 percent indicated that the "packaging material" was the decisive factor in their decision, followed by 65.1 percent stating that "recyclability/reusability" were an (additional) decisive factor. Therefore, hypothesis H1 is confirmed. However, it must be noted that people are more likely to identify with sustainability or state that they would buy products in sustainable packaging if asked directly. This phenomenon is known as the social norm (McLeod, 2008).

On the contrary, 60.5 percent of young consumers would purchase chocolate in the most sustainable packaging without being asked to choose the most sustainable package. Summarizing Gen Zers can identify the most sustainable packaging without any additional influencing factors given.

4.2. Influence of Environmental Awareness on the Purchase Intention of Chocolate in Circular Packaging

A consumers' EAS was calculated to evaluate the influence of the level of environmental awareness of pro-environmental young consumers regarding their PI of chocolate in circular packaging (H2). Based on previously mentioned adequate tests, a factor analysis with orthogonal (varimax) rotation was performed to assess the environmental awareness as one overall EAS.

A linear regression analysis was applied to investigate the relationship between the consumers' EAS on their intention to purchase chocolate in CP. The obtained model, summarized in Table 1, is statistically significant with $p < 0.001$. $R^2 = 21.5\%$ of the variance of PI is explained by the variances of environmental awareness.

Table 1. Coefficients Table Hypothesis 2

Coefficients^a Table H2						
Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Correlation
		B	Std. Error	Beta			
1	(Constant)	0.564	0.121		4.667	0.000	
	EAS	0.391	0.051	0.463	7.630	0.000	0.463
a. Dependent Variable: Purchase of Chocolate in CP							

Source: Authors

Therefore, hypothesis H2 can be confirmed, suggesting that the higher the young consumers' EAS level, the more likely they will purchase chocolate in CP. According to the survey results, sustainability is important for 78.6 percent of the participants, proving that sustainability is firmly anchored in Gen Zer's mind and occupies an increasingly important position. While the majority of respondents are willing to limit their consumption to protect the environment, 78.1 percent also believe that consumers themselves must do something for sustainability.

4.3. Willingness to Pay for Chocolate in Circular Packaging

A simple linear regression was performed to investigate the impact of the consumer's environmental awareness on their WTP for chocolate in CP (H3). The obtained model shown in Table 2 is statistically significant with $p < 0.001$. $R^2 = 63\%$ of the variance of WTP is explained by the variances of environmental awareness.

Table 2. Coefficients Table Hypothesis 3

Coefficients^a Table H3						
Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Correlation
		B	Std. Error	Beta			
1	(Constant)	86.511	17.572		4.923	0.000	
	EAS	17.354	4.578	0.252	3.791	0.000	0.252
a. Dependent Variable: WTP in ct							

Source: Authors

Therefore, hypothesis H3 is confirmed, implying that German Gen Zers are willing to pay more for sustainable packaging (following Lindh et al., 2016). With every increase in the unit of the EAS, a Gen Zer is willing to pay 17 cents

more for chocolate in CP. The most frequently indicated price consumers would pay for chocolate in CP is 1.50 Euros (16.7%), while the average price is 1.48 Euros. 18.5 percent of the participants would pay 2.00 Euros or more. On the contrary, 12.1 percent would not pay more for chocolate packaged in CP.

4.4. Influence of Recycling Attitude towards Recycling Intention

To evaluate the influence of recycling attitude on recycling intention (H4), again, one overall variable for the attitude of consumers towards recycling was created with factor analysis. The subsequently performed regression, displayed in Table 3, shows a significant influence ($p < 0.001$) with a low $R^2 = 9.01\%$ of the variance of recycling intention is explained by the variances of recycling attitude.

Table 3. Coefficients Table Hypothesis 4 (1)

Coefficients^a Table H4 (1)						
Model	Unstand. Coefficients		Stand. Coefficients	t	Sig.	Correlation
	B	Std. Error	Beta			
1 (Constant)	0.783	0.292		2.678	0.008	
Recycling Attitude	0.742	0.161	0.302	4.617	0.000	0.302
a. Dependent Variable: Intention to Recycle						

Source: Authors

Therefore, hypothesis H4 can be confirmed, stating that the more positive the consumers' attitude towards recycling, the more likely they would recycle circular chocolate packaging.

However, to explore which attitudinal factors significantly influence the intention to recycle, the factors *Goodness*, *Relevance*, *Simplicity*, *Interest*, and *Impact* serve as IVs in the following significant multiple linear regression analysis ($p < 0.001$) displayed in Table 4. The adjusted $R^2 = 9.5\%$ of the variance of recycling intention is explained by the variances of at least one factor. The regression was checked for multicollinearity with the variance inflation factors (VIF) smaller than 2, and no multicollinearity issues occurred (Cleff, 2015: 160).

Table 4. Coefficients Table Hypothesis 4 (2)

Coefficients[a] Table H4 (2)								
Model		Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	1.661	0.298		5.566	0.000		
	Goodness	0.382	0.128	0.232	2.989	0.003	0.701	1.427
	Relevance	- 0.040	0.127	- 0.032	- 0.313	0.755	0.783	1.277
	Simplicity	- 0.126	0.062	- 0.134	- 2.042	0.042	0.981	1.019
	Interest	0.171	0.063	0.186	2.724	0.007	0.908	1.102
	Impact	- 0.009	0.134	- 0.004	- 0.065	0.948	0.888	1.127
a. Dependent Variable: Intention to Recycle								

Source: Authors

The IVs *Goodness* ($\beta = 0.232$, $p = 0.003$), *Simplicity* ($\beta = -0.134$, $p = 0.042$), and *Interest* ($\beta = 0.186$, $p = 0.007$) are significant, implying that these attributes influence the intention to recycle circular chocolate packaging.

The results suggest that the better consumers perceive the topic of recycling, the more likely they will recycle product packaging. Overall, the perception of recycling is positive, but the social norms theory should not be forgotten. Furthermore, the level of *Simplicity* has a significant negative impact on the intention to recycle. Reasons for this could be the lack of experience in recycling or a complicated procedure associated with additional work. *The interest* in recycling shows that individuals interested in recycling intend to recycle circular chocolate packaging. The result aligns with previous studies (Davis, 2006; Meneses & Palacio, 2005), supporting its applicability to the specific research target group.

4.5. Influence of Recycling Knowledge and Information Towards Purchase Intention of Chocolate in Circular Packaging

Again one overall variable for all different factors of knowledge and information (recycling behavior) was created with factor analysis to investigate the influence of recycling knowledge and information on the PI of chocolate in CP (H5). The subsequently performed regression, displayed in Table 5, shows a significant influence ($p < 0.001$) with a low $R^2 = 6.2\%$ of the variance of PI is explained by the variances of recycling knowledge and information.

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Table 5. Coefficients Table Hypothesis 5 (1)

Coefficients^a Table H5 (1)						
Model	Unstand. Coefficients		Stand. Coefficients	t	Sig.	Correlation
	B	Std. Error	Beta			
1 (Constant)	0.644	0.216		2.983	0.003	
Recycling Knowledge	0.319	0.085	0.249	3.752	0.000	0.249
a. Dependent Variable: PI of Chocolate in CP						

Source: Authors

Therefore, hypothesis H5 can be confirmed. The higher the recycling knowledge and information level, the more likely young consumers are to purchase chocolate in CP.

To determine which individual factors influence the PI, various IVs, illustrated in Table 6, are introduced in the multiple linear regression (p < 0.001). The R^2 increased to 17.5% with no multicollinearity issues.

Table 6. Coefficients Table Hypothesis 5 (2)

Coefficients^a Table H5 (2)							
Model	Unstand. Coefficients		Stand. Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
1 (Constant)	1.427	0.244		5.850	0.000		
Personal Knowledge	-0.020	0.045	- 0.029	- 0.452	0.662	0.932	1.073
Available Information	-0.129	0.045	- 0.187	- 2.859	0.005	0.901	1.110
Potential Information	0.075	0.051	0.119	1.475	0.142	0.594	1.683
Information about Material handling	0,097	0.051	0.148	1.897	0.059	0.629	1.590
Information on Packaging	0.143	0.068	0.162	2.113	0.010	0.657	1.523
a. Dependent Variable: PI of Chocolate in CP							

Source: Authors

The IVs *Available Information* (β = -0.187, p = 0.005) and Infor*mation on Packaging* (β = 0.162, p = 0.036) are statistically significant. The amount of *Available Information* significantly negatively influences the PI, as more than 96 percent state that there is not enough information about the recycling of chocolate packaging. The less information available, the fewer young consumers purchase chocolate in CP. The *Information on Packaging* significantly influences

the PI, with more than 90 percent demanding that chocolate packaging contain more information about its recyclability.

4.6. Intention to Recycle Circular Chocolate Packaging After Buying It

A simple linear regression was conducted to evaluate whether potential buyers of chocolate in CP would also have the intention to recycle its packaging (H6). The obtained model, illustrated in Table 7, is statistically significant (p < 0.001) with $R^2 = 11.0\%$ of the variance of recycling intention explained by the variances of purchase of chocolate in CP.

Table 7. Coefficients Table Hypothesis 6

Coefficients[a] Table H6						
Model	Unstand. Coefficients		Stand. Coefficients	t	Sig.	Correlation
	B	Std. Error	Beta			
1 (Constant)	1.341	0.162		8.280	0.000	
Purchase of Chocolate in CP	0.527	0.103	0.331	5.121	0.000	0.331
a. Dependent Variable: Intention to Recycle						

Source: Authors

Therefore, hypothesis H6 can be confirmed with a positive influence of the PI on Gen Zers' intention to recycle the packaging. The more likely young consumers will purchase chocolate in CP, the more likely they will recycle the packaging. More than 90 percent of the attendees articulated that they would (tend to) buy chocolate in CP, while 70 percent of the respondents would (tend to) recycle it. Figure 3 summarizes all significant statistical relationships.

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Figure 3. Final Research Model
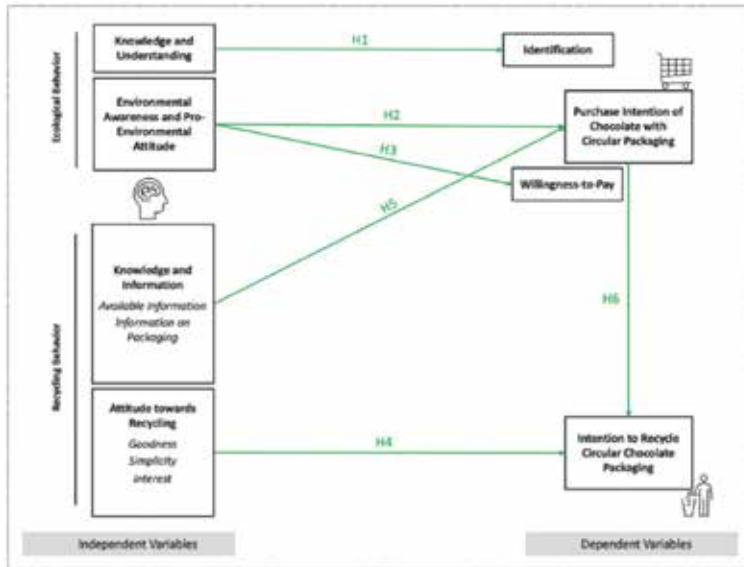
Source: Adapted from Ketelsen et al., 2020; Grunert & Wills, 2007; Grunert, 2011.

5. MANAGERIAL IMPLICATIONS

The research findings provide first guidance for researchers in the field of con- summer's perception towards CP as well as the theory of CE in the context of the chocolate industry. Since a chocolate product wrapped in CP does not currently exist, marketers need to understand what will drive consumers to purchase such products and to place them accordingly while implementing the model of CE in their company's philosophy. The following implications are based on an imminent launch of chocolate in CP, and the research findings will be underpinned using the marketing mix of the 4Ps.

5.1. Product

The product's packaging plays an important role when trying to address new or existing customers due to the impulsive buying behavior of chocolate. Consumers demand transparent labels and information to purchase chocolate in CP.

Manufacturers should create attractive extrinsic attributes based on the competitive chocolate shelves to ensure visibility beyond all brands. This involves incorporating attention-grabbing disruptors to highlight their packaging is the most sustainable due to its circularity. This study introduced a potential CE score that is considered helpful by Gen Zers and could therefore be implemented by brand managers.

Moreover, QR codes can be implemented to educate and convince young consumers to buy chocolate in CP and inform them how to recycle the packaging. This would also enable additional interaction with Gen Zers.

5.2. Price

Young consumers are willing to pay more for products that protect the environment. On average, consumers would pay 1.48 Euros for a 100g chocolate tablet in CP when the same type of chocolate is available in plastic packaging for 0.99 Euros. Chocolate manufacturers must ensure not to exceed the WTP of Gen Zers.

5.3. Place

Young individuals buy chocolate mainly in retail stores. Thus companies need to ensure availability in these distribution channels. This would encompass supermarket chains such as the Edeka Group, Rewe, Markant, and the Schwarz Group for Germany. Other distribution channels like gas stations and vending machines should also be explored. The POS presents an excellent opportunity to target and convince potential customers, wherefore, Trade Marketers are advised to create an outstanding POS journey that turns the POS into a Point of Experience.

5.4. Promotion

So far, the topic of CE, especially CP, is not widely known among Gen Zers. Since this target audience is well versed in technical devices, attention can be created through the internet and social media, e.g., influencers. Moreover, companies should promote their innovation offline at the POS, where shoppers can be inspired to buy. In this context, transparent information is critical.

When young consumers have a high level of environmental awareness, knowledge, and information about recycling, the likelihood of purchasing chocolate in CP increases. Therefore, enhancing awareness and distributing precise information about the packaging and the related recycling process is recommended. To ensure success, field experiments should be executed beforehand.

6. LIMITATIONS

The following limitations constrain the explanatory power and generalizability of the results obtained. First, the final sample did not accurately reflect the population, resulting from the applied non-probability sampling approach. Consequently, the findings cannot be generalized to German Gen Zers. Moreover, the age distribution is not even. Hence, the results are distorted.

In addition, the participants could not touch and feel the chocolate mockups. Additional sensory stimuli such as sight, smell, or touch, which can play an essential role in decision-making when buying chocolate, could not be conveyed through the illustrations. Thus, the evaluations in the survey of the three different types of chocolate packaging only rely on the imaginations of the respondents. In addition, explanations of variances of IVs are low due to word limitation.

7. CONCLUSION

Only providing chocolate does not fulfill the expectations of young consumers striving for a more environmentally-friendly world. Considering the challenges of packaging waste in the FMCG industry, and in this context of the chocolate manufacturers in Germany, the growing dominance of Gen Z, chocolate manufacturers need to rethink their packaging strategy. Hence, buying chocolate accounts for impulsive buying behavior; consumers purchase a certain type of chocolate within a few seconds at the POS. At the same time, many individuals do not pay attention to the packaging material and its way of production, which makes it even more critical for companies to label environmentally friendly/circular chocolate packaging in a way that attracts potential customers. This can also lead to a substantial competitive advantage for chocolate manufacturers, as no known chocolate seller boxes its chocolate in CP.

The online survey diminishes the lack of research regarding consumers' perceptions of circular chocolate packaging. This study reveals relationships between ecological and recycling behavior and young consumers' identification of sustainable packaging, WTP, purchase, and recycling intention concerning the theory of CE. So far, the concept of CE has not been widely embraced by young people, so companies need to begin enlightening them.

This paper can serve as preliminary communication to test the model on a higher level, wherefore future research is recommended. By selling chocolate in CP to Gen Z, chocolate manufacturers will gain a competitive advantage and thus survive in the highly competitive confectionery market.

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WINE TOURISM: CROATIA'S POTENTIAL

Dejan TUBIĆ, Ph.D.
Virovitica University of Applied Sciences

E-mail: dejan.tubic@vuv.hr

Rikard BAKAN, MB econ.
Virovitica University of Applied Sciences,

Email: rikard.bakan@vuv.hr

Marko BLAŽEVIĆ
Virovitica University of Applied Sciences

E-mail: marko.blazevic@vuv.hr

Abstract

Considering the issue of Croatian tourism, particularly its seasonality, it is estimated that developing specific forms of tourism could mitigate the negative effects of seasonality and enhance Croatia's competitiveness in the tourism market. Croatia, with its diverse and abundant attractions across its entire territory, possesses untapped potential for developing specific forms of tourism in high demand in the market. One such form is wine tourism, which has garnered attention from the scientific and business communities worldwide. However, despite Croatia's potential in this area, it is evident from the analysis of scientific and professional databases and examples of successful practices in Croatia that wine tourism is not receiving adequate attention. Croatian wines have consistently won awards at prestigious wine exhibitions for several years, and the tourism market recognizes the diversity and quality of the wine offerings. Croatia is already established as a popular vacation destination. These factors, combined with the growing interest in exploring the unique aspects of Croatian wine, should be leveraged to create authentic wine tourism experiences based on the rich tradition of wine production and the intangible heritage and cultural elements associated with it. By utilizing the method of meta-analysis of

the scientific and professional literature, statistical reports, and strategic documents of successful wine tourism destinations- New Zealand and Australia, the authors wanted to raise awareness for destination management primarily and for other actors involved with the development of a destination's tourism offer that for Croatia to be better positioned as a wine tourism destination, a strategic reassessment is required, not only involving the integral development of this specific form of tourism on a destination level but also applying good practices from successful destinations on a global level. The goal of this paper is not only to give a theoretical overview of the wine tourism phenomenon on the example of New Zealand, which is basing a great deal of its international tourism offer precisely on wine tourism as experience tourism, but also to encourage the scientific, professional, and business community in Croatia to reassess the comparative advantages that Croatia has in the wine sector and to turn those advantages into competitive advantages in this segment of the tourism offer.

Keywords: *specific forms of tourism, wine tourism, New Zealand, Croatia*

JEL Classification: *L83, Z32*

1. INTRODUCTION

The impact of tourism, with its multifaceted presence, on various sectors can also be seen in agricultural production. Wine, initially as an agricultural product and later as a motive for tourist activities, has captured diverse groups' interest for many years. The integration of wine culture and tourism into a single product can find its foundation because wine is essential to numerous tourist activities. By enhancing the core product with experiential elements related to oenological heritage and other attractions, the tourism offerings of a destination can gain additional competitive advantages. Wineries and destinations can derive economic and social benefits from wine tourism, which manifests through various effects. Destinations with the necessary conditions for developing this specific form of tourism, either as a primary or supplementary product, must primarily understand its essential elements. Croatia, with its diverse range of resources, holds significant potential for developing specialized forms of tourism. This potential should drive the expansion of the tourism sector, reducing overreliance on the traditional "Sun, Sea, and Sand" model and mitigating the negative impacts of seasonality, which often characterize Croatian tourism. Based on the factors mentioned above, the potential for the growth of wine tourism is evident. This will be further supported and substantiated through detailed analysis.

2. WINE TOURISM TERMINOLOGY

Despite the author's initial belief that wine tourism represents a significant interest in the Croatian scientific and professional community, a review of domestic literature reveals a lack of scientific and professional studies on this subject. To provide a theoretical argument and establish the facts about the exceptional resource base for developing wine tourism in Croatia, wine tourism will be examined terminologically based on the available literature. Interest in wine tourism within the academic community emerged mid-to late-1990s (Mitchell & Hall, 2006). Noteworthy authors who explore this specific form of tourism include Beverland (1998), Bruwer (2003), Hall et al. (2000), Carlsen (2004), Getz & Brown (2006), Marzo-Navarro and Pedraja-Iglesias (2009). The potential of wine tourism as a form of tourism that integrates the entire destination offering is exceptional. This raises the question of who the stakeholders are and who can benefit the most when wine tourism realizes its true potential (Bruwer, 2003).

Unfortunately, wine tourism has received limited attention in the literature thus far (Brewer, 2003, as cited in Hall et al., 2000). To foster the development of wine tourism, it is necessary to establish the theoretical foundation and critical elements required for its growth. In the case of wine tourism, research indicates that attributes such as landscapes, open spaces, the presence of vineyards and wineries involved in wine production and storage, the opportunity to purchase wine, opportunities for social interaction, and the meaningful combination of tangible and intangible cultural heritage are solid incentives for visiting a wine region (Marzo-Navarro & Pedraja-Iglesias, 2008, as cited in Getz et al., 1999; Telfer, 2001; Dodd & Bigotte, 1997; Hall et al., 2000; Hall & Mitchell, 2002). Determining a typical wine tourism destination and its spatial concentration poses uncertainties for the authors. While wine tourism is often associated with rural tourist destinations and rural areas, de Oliveira and Filho (2016) suggest that wine tourism can also be successfully developed and compete in urban areas. They support this notion with the example of the "City of Wine Civilizations" in Bordeaux, demonstrating how both environments complement each other successfully. This highlights the potential to create an exceptionally competitive and sought-after tourism product by offering various products and activities and integrating rural and urban wine tourism experiences.

Furthermore, the issue becomes evident in the conceptual determination of wine tourism. A globally accepted and unified definition of wine tourism does

not exist. Tubić (2019) employed a methodology to identify nine fundamental dimensions of wine tourism to define them. (Table 1) Through terminological determination, it becomes apparent that two definitions encompass all the appropriate dimensions in their structure (Sparks 2007; Manila 2012, as cited in Dubrule 2007). However, these definitions do not meet the criteria for integrating offerings in rural and urban areas. Most definitions include a wine region as one of the main elements for conducting wine tourism. A wine region is often associated with its characteristics of rural life and work, enabling direct interaction with tourists within the experience of wine tasting, gastronomy, and nature-related activities, which represents the primary attraction for wine and wine culture enthusiasts. Based on this, it can be concluded that regardless of the earlier fact that spatial concentration is not strictly limited to rural areas but also occurs in urban areas, the connection between wine tourism attractions and the rural environment is crucial for developing this type of tourism offering. Marzo-Navarro and Pedraja-Iglesias (2009) support this idea by stating that wine tourism acts as a complementary channel for generating wealth in rural areas, concentrating outside traditional urban areas, and playing a significant role in the economic development of rural zones where wine is produced. This positively impacts job creation, business growth, and investment. However, there is a challenge in defining the scope of development, particularly regarding one of the elements mentioned.

Table 1. Wine tourism definition overview

| AUTHORS | DEFINITIONS | Dimension | | |
		Rural (wine region)/ Urban area	Purpose of visit/motive	Attractions
Hall et al., 1997	Visiting vineyards, wineries, wine festivals, and wine exhibitions, where wine tasting and experiencing the attributes of a wine region are the main motivating factors for visitors.	-	wine tasting and experiencing the attributes of the wine region	vineyards, wineries, wine festivals, wine exhibitions
Macionis, 1998	Visiting vineyards, wineries, wine festivals, and wine exhibitions, where wine tasting and experiencing the attributes of a wine region are the main motivating factors for visitors.	-	wine tasting and/ or experiencing the attributes of a wine region	vineyards, wineries, wine festivals, wine exhibitions

Hall et al., 2000	Visiting vineyards, wineries, wine festivals, and wine exhibitions, where the primary motive of visitors is wine tasting and/or experiencing the attributes of wine-growing regions.	-	wine tasting, experiencing the attributes of a wine region	vineyards, wineries, wine festivals, wine exhibitions
Getz et al., 1999	A form of consumer behavior based on the appeal of wine, wine regions, and the implementation of marketing strategies for the wine industry and destinations where wineries and wine-related experiences serve as the primary attractions.	-	The attractiveness of wine, wine regions	Wineries and experience related to wine
Western Australian Tourism Commission/ Wine Industry Association of Western Australia, 2000	Traveling to experience wineries and wine regions and their connection to the (Australian) way of life. Wine tourism encompasses both service provision and destination marketing.	-	The experience of wineries and wine regions	Wineries and wine regions
Getz and Brown, 2006	Wine tourism is a specific form based on the desire to visit wine regions and/or where travelers are encouraged to visit wine regions and wineries, especially during their travels for other reasons.	-	-	Wineries wine regions
Sparks, 2007:1180	Visiting a wine region for recreational purposes	wine region (rural area)	recreation	Wine region
Manila, 2012:55 according to Dubrule, 2007	All activities available to tourists in wine regions include visiting wine cellars, wine tastings, accommodation options, restaurants, and experiences related to the unique characteristics of the wine "terroir" and local traditions.	wine region (rural area)	All activities in wine regions	wine cellars, accommodation, restaurants, wine products

Source: Adapted by authors

The European Enotourism VINTUR project by Deloitte (2005) identifies wine culture, tourism, territory, authenticity, sustainability, and competitiveness as the main elements of wine tourism development (Figure 1). According to Salvado (2016), wine culture represents the thematic core that tourists must experience throughout the entire value chain of the wine product. The concept of territory, as described by Painter (2010), refers to limited space. This raises the question of what exactly is limited: rural or urban areas? Therefore, the author believes the term "wine region" would be more suitable to define the territory precisely.

Furthermore, tourism is an element that needs to reach a certain level of development, and the destination must have an existing tourism infrastructure. The quality of the destination's tourism facilities is a crucial aspect of the success of wine tourism development, as emphasized in the VINTUR project. Salvado (2016) provides insight into the remaining elements, stating that for business success and development, it is necessary to develop innovative and diverse production strategies (to ensure competitiveness), create a unique tourist experience that promotes and explores wine culture (providing authenticity), and align the interests of all stakeholders in the tourism value chain (achieving sustainability).

These considerations highlight the need for a new comprehensive definition. Although not encompassing all elements, the most precise and widely cited definition is by Hall et al. (2000), who define wine tourism as "visiting vineyards, wineries, wine festivals, and wine shows, where the main motivating factors for visitors are grape wine tasting and/or experiencing the attributes of a grape wine region." One criticism of this definition is the exclusion of one of the leading products of wine tourism: wine routes. Bruwer (2003) emphasizes that developing wine routes is integral to the wine tourism industry. Koščak (2018) also provides their perspective on wine routes, linking the development of wine tourism to the planning and establishing such routes. It is important to note that while wine tourism can occur in urban areas, its essence is inherently rural and should be considered as such in further discussions.

Figure 1. The Developmental Elements of Wine Tourism

Source: Deloitte Vintur Project, 2005

3. WINE TOURISM PRODUCTS

According to Smith (2004), the development of integrated products is a prerequisite for meeting the evolving demands of tourists and ensuring the long-term profitability of the tourism industry. While wine itself is a major motivating factor, it is not sufficient to satisfy the needs of today's wine-culture-oriented tourists. By combining various tourist attractions available in wine regions, an integrated product is created that can cater to the diverse preferences of tourists. Mitchell and Hall (2006) identify the wine products: wineries and vineyards, wine festivals, wine routes, and other wine-related attractions (such as wine museums). Manila (2010) provides a detailed analysis of wine products, categorizing them accordingly (Table 2). It is important to note that each destination will focus its wine tourism development on the dominant and competitive types of wine tourism products it possesses. Destinations with a broader range of products will experience a higher level of development. Manila's classification highlights the multiple features associated with each product. Carlsen and Dowling (2001) also argue that the wine tourism experience can encompass various features, including:

- Events, festivals, and wine celebrations
- Restaurants and fine dining experiences
- Education and interpretation
- Hospitality and accommodation
- Wine tours and visits
- Regional travel incorporating wine trails
- Information centers
- Provision of wine information through verbal communication and written documentation
- Wine tasting and direct sales from wineries
- Retail outlets offering local products
- Architectural and heritage features
- Specialized accommodation near wineries
- Wine routes that showcase wine production and viticulture processes
- Wine villages comprising wineries, events, and themed accommodations.

These considerations highlight the diversity and breadth of offerings within wine tourism. Considering the attractiveness of tourist destinations, the tradition of wine production, wine culture, and the diverse offerings of Croatian wine regions, Croatia is well-positioned to develop and excel in this type of tourism product.

Table 2. Wine tourism products

Wine tourism products	Product Description
Wine routes	Designated itineraries in wine-producing regions for discovering wine cities, wineries, and cellars.
Wine tours	Designated itineraries that allow for the discovery of wine cities through tours.
Organized trips to and accommodation in vineyards	Packages that encompass accommodation, catering, and transportation of varying durations, providing activities for the exploration of vineyards in one or more facets (oenological, gastronomic, cultural, technical, gala dinner).
Wine courses	Wine courses aimed at improving product marketing knowledge and everything related to production (culture, tradition, production techniques).
Wine cellars	Cellar tours; visiting winemakers known for their cellars.
Wine museums	Cultural sites aimed at showcasing the world of wine and transmitting ancestral knowledge and traditions.
Wine holidays and festivals	Events aimed at preserving local traditions, promoting wine, and animating the territory; Example: at the European level, Wine Tourism Days; at the local level, International Wine and Grape Festival and Bacchus Wine Festival in Focșani.
Wine fairs, local fairs, wine events	These products serve to stimulate wine sales. Example: International Wine Fair Vinvest.

Source: Manila, 2012

4. WHAT CAN WE LEARN ABOUT DEVELOPING A SUCCESSFUL WINE TOURISM DESTINATION FROM THE EXAMPLE OF NEW ZEALAND - CAN CROATIA DO THE SAME?

Every receptive country will base the development of wine tourism on the types of products it possesses. However, being a significant wine producer does not guarantee the development of wine tourism. Manilla (2010) highlights an intriguing fact that despite Europe being the most extensive wine producer, accounting for over 70% of the global market, the development of wine tourism lags far behind countries such as California (USA), South Africa, Argentina, Australia, and New Zealand. Notably, New Zealand and Australia stand out in their wine tourism development. This observation is supported by Mitchell

and Hall (2006), who notes that the majority of published scientific and professional literature on wine tourism originates from these two countries. Their research reveals that 38% of publications come from Australia, while 31% come from New Zealand. In contrast, less than one-fourth of publications come from North America. These statistics demonstrate the advanced level of wine industry development and the accompanying tourism infrastructure in New Zealand and Australia.

In contrast, a review of the Croatian literature shows a lack of publications covering wine tourism, indicating a need for further research and documentation in this area. Additionally, there is a lack of statistical data at the national level to assess the current situation on the ground. It is noteworthy that wine tourism is not included as a strategic direction for developing tourism offerings in any of Croatia's strategic documents. Nevertheless, some indicators can be observed through wine production and consumption. According to the Annual Report on Viticulture, Viniculture, and Olive Growing (2019) published by the Croatian Agency for Agriculture and Food, Croatia has 19,022.09 hectares of vineyard areas. The dominant grape varieties cultivated in these vineyards are Welschriesling Malvasia Istriana and Plavac Mali. In the 2018 wine year (August 1, 2018, to July 31, 2019), 3,820 producers reported production of 109,137.88 tons of grapes and 73,257,835 million liters of wine. Quality wine comprises most of the production, followed by fruit, varietal, table, and a more miniature representation of premium wine. In 2019, Croatia exported 5.25 million liters of wine, indicating growing recognition and appreciation of Croatian wines internationally.

To compare these figures with a leading wine tourism country like New Zealand, according to the Annual Report of the New Zealand Winegrowers (NZAR) for 2019, New Zealand produced 301.7 million liters of wine on 38,680 hectares of vineyards, with 255 million liters of wine exported in 2018. Statistical data from NZAR (2019) reveal that New Zealand attracted 776,599 international wine tourists, while comparable data for Croatia is unavailable. The report also indicates that international wine tourists in New Zealand have more extended stays and higher spending than other tourists. Regarding visitor interest, research by the Institute for Tourism, Tomas (2019) indicates that wine tourism products are mentioned primarily in activities during tourists' stays in Croatia. The most interested guests in wine tourism activities come from countries such as Serbia, the Netherlands, the United Kingdom, and

the United States. Notably, visitors from the United Kingdom show a significant interest in wine regions, including those in New Zealand, suggesting that the proximity of markets and increasing interest in the Croatian wine scene at the European level could present an opportunity for Croatia to establish itself as a new wine tourism destination.

In conclusion, the example of New Zealand's successful wine tourism development highlights the importance of strategic planning, research, and supportive government measures. Croatia can learn from New Zealand's experience and work towards strengthening its wine tourism industry by promoting research, gathering statistical data, and implementing strategic initiatives to enhance its wine tourism offerings.

5. CONCLUSION

When considering the above facts about wine tourism, it is crucial to highlight its complexity and dependence on agricultural production. Wine tourism cannot exist without the production of wine and the overall immersive experience of a wine destination. From the perspective of modern-day tourists, the distinctiveness and uniqueness of local communities have become significant reasons for embarking on tourism journeys. Suppose the development of tourism offerings in destinations is based on key attractions encompassing both tangible and intangible heritage and the consumption of high-quality products produced within the destination and recognized in the market due to their local characteristics enriched with additional elements of the tourism experience. In that case, such destinations can anticipate long-term recognition and competitiveness in the tourism market (Frost et al., 2020). Exemplary models of successful wine tourism development can be found in countries like New Zealand and others that have effectively utilized their wine-based resources.

Croatia, with its proximity to key tourist markets, competitive pricing, quality products, and rich tradition, represents an environment suitable for wine tourism development. For Croatia to fully utilize its comparative advantages, which it has as a country with a rich enological legacy, the key shareholders must utilize the successes of Croatia's winemakers on the international scene and, with it, the increased interest of potential tourists to discover the destinations where the awarded wines are produced. In addition, the core product has to be embellished with experience elements, integrating wine as a critical

resource and an integrative factor of the entire tourism offer. Of course, this is not enough because succeeding in the global competitive market depends, among other factors, on the collaboration among all tourism service providers, internally and with other complementary stakeholders within the destination. In this context, the success of wine tourism as a tourism product will primarily rely on the collaboration of all vineyard owners and other stakeholders within the destination. This collaboration aims to establish standards for the tourism value chain and deliver a unique wine tourism experience based on authenticity, intangible and tangible heritage, and the local community's way of life.

As previously mentioned in the Introduction, this paper aimed to raise awareness for the scientific, professional, and business community of the untapped potential of Croatia as a wine tourism destination. To analyze the actual potential of individual destinations and their comparative advantages, more empirical research is required, not only from the perspective of the tourism offer but also from the perspective of the tourism demand- preferences and motives of potential tourists and, accordingly, the ways on how to create an authentic experience of wine tourism in individual Croatian wine regions so that they might be better positioned on the tourism market.

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IMPACT OF INTERNAL MARKETING COMMUNICATION ON THE SATISFACTION OF POLITICAL PARTY MEMBERS

Ante BEKAVAC
Hydrographic Institute of the Republic of Croatia, Split

E-mail: ante.bekavac@hhi.hr

Erik RUŽIĆ, Ph.D.
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković"

E-mail: erik.ruzic@unipu.hr

Dragan BENAZIĆ, Ph.D.
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković"

E-mail: dbenazic@unipu.hr

Abstract

Internal marketing (IM) is a perpetual topic in practical marketing and research, especially today when many businesses face personnel shortages. One of the neglected aspects of internal marketing is its impact in the political arena and within political parties. Political parties and other organizations strive to achieve high member engagement, satisfaction, and motivation levels. These outcomes can, inter alia, provide more effort in political activities during the campaign and more positive word-of-mouth by members of political parties. Based on the existing literature, IM has the potential to impact people's attitudes and behavior. The paper's primary purpose is to research the impact of internal marketing activities on political party members. The research showed that internal marketing positively impacts political party members' satisfaction. Based on the present results, political party leaders may plan internal marketing activities to increase member satisfaction and improve the politi-

cal party's perception and election results. This research adds to the body of knowledge on using internal marketing in the specific context of politics. A few limitations could be the basis for further research; for instance, the sample size, the share of individual political parties, and the fact that the research is only valid in Croatian realities. Further research should encompass a more comprehensive sample, all the parties should be included equally, and the model should be tested in other cultural settings.

Keywords: *internal marketing, political parties, satisfaction*

JEL Classification: *M3*

1. INTRODUCTION

Internal marketing (IM) as a marketing topic emerged in the early 70s (Varey & Lewis, 1999; Piercy & Morgan, 1991) and was seen as a remedy for service quality heterogeneity. It was then that people, as one of the 7Ps, were discovered and highlighted as one of the most critical factors in the service sector, primarily because of their face-to-face contact and the role of direct service creators. Berry (1981) wrote about the importance of highly motivated and satisfied employees for delivering quality services, resulting in customers' loyalty and companies' higher profits. Gronroos (Rafiq & Ahmed, 2003) highlighted the importance of skilled employees for sales results and higher interaction quality during service delivery. Moreover, Rafiq and Ahmed (2003) developed an operational model for implementing internal marketing. The model described "product" (in the implementation of internal marketing) as various intangibles, such as new ideas, procedures, services, strategies, organizational changes, and similar.

People are seen as extremely important for services (intangibles), and internal marketing has shown a potential to improve the implementation and the outcomes of different, again, intangibles such as political ideas and people's motivation, satisfaction, skills, and interactions.

On the other hand, political parties as organizations can have similar goals as for-profit organizations. Specifically, political parties "sell" ideas and visions of a better future (intangibles), and it can be expected, like in for-profit organizations, that well-motivated and satisfied party members will put more effort into promotion and overall activities, which is likely to lead to better results when it comes to elections consequently.

In short, internal marketing shows the potential to impact the motivation, satisfaction, behavior, attitudes, and performance of members of political parties, and by doing this, it impacts their effort and electors' perceptions and finally leads to better election results (the outcome that can be seen as profit in for-profit organizations). Like in for-profit organizations (Varey & Lewis, 1999), internal marketing within a political party can bring a competitive advantage. Moreover, as Piercy and Morgan (1991) stated for for-profit organizations, internal marketing could be the missing half of political marketing (besides external marketing). Political marketing is gaining importance nowadays and represents the use of marketing tools and approaches in a political process (Menon, 2008). Accordingly, the marketing mentality is widely applied by political parties, but there is not enough research on using the internal marketing concept in politics.

It should be noted that there are different approaches to the concept of IM (Ferdous, 2008). Rafiq and Ahmed (2003: 1183) stated that *one of the most common IM applications is crafting internal communication strategies.* Studies (Ferdous, 2008) showed the importance of internal communication by highlighting that poor communication can lead to a lack of clarity, confusion, and consequently diminished commitment and motivation.

Ružić et al. (2016) highlighted that although numerous research studies focused on internal marketing, there is not enough research on implementing internal marketing in the nonprofit and public sectors. There are, as well, several research studies focused on the use of marketing in political processes (O'Cass, 1996). However, to the authors' knowledge, there is not enough research on the use and impact of internal marketing in political parties.

Therefore, the paper's primary goal is to assess the impact of internal marketing communication on the level of satisfaction of political party members in the Republic of Croatia. Moreover, the paper aims to assess the impact of individual internal communication facets on political party members' satisfaction.

The research results will bring new insights into internal marketing (especially internal marketing communication) used in political marketing and among political parties in the particularities of the Croatian context.

The results can help political leaders strive to achieve better election results in democratic countries by using internal marketing; namely, better communications (as a crucial internal marketing aspect) could lead to higher political

party members' satisfaction and motivation, which would eventually lead to improved performance, productivity with more good attitudes and behavior.

The paper consists of six chapters. After the introduction, the literature review is presented. The third chapter describes the methodology. The fourth chapter presents the research results, the measurement and structural model analysis, and the importance of the political party members' satisfaction analysis. The fifth chapter is dedicated to discussion and implications. The last chapter covers the conclusion and limitations of the research and provides directions for future research.

2. LITERATURE REVIEW

Applying marketing in politics started in 1920 in Great Britain (Lock & Harris, 1996). However, while the primary marketing goal is to satisfy consumer needs, the idea behind the use of marketing in political processes is to meet the voters' needs in a better way. Even the American Marketing Association (AMA) in 1985 added the term "ideas" (as in "political ideas") to "product and services" in their definition of marketing (Wring, 1997).

Despite the potential of marketing for political parties, O'Cass (1996) in his research pointed out that people within political parties who should oversee implementing marketing strategies had little understanding of marketing. The attitude of marketing people within political parties was mainly negative, primarily because of the short effects of the implemented marketing activities.

In today's digital era, the importance of political marketing, especially communication, is high but simultaneously challenging and even with dangerous facets (Perloff, 2022).

On the other hand, internal marketing has been proven as an efficient management tool (Finney & Scherrebeck-Hansen, 2010), especially in today's very competitive environment (competition among political parties in a democracy is almost always high). Internal marketing means the application of "external" marketing activities within an organization to achieve goals within and eventually outside of the organization or in the market. Green et al. (1994) referred to internal marketing as a key to external marketing success, and Piercy and Morgan (1991) referred to it as the missing half of marketing. Lings (2004 in Ferdous, 2008) stated that there are various interpretations of the role and comprehension of internal marketing.

Rafiq and Ahmed (2000: 454) provided a comprehensive definition of internal marketing that read: *Internal marketing is a planned effort using a marketing-like approach to overcome organizational resistance to change and to align, motivate and inter-functionally co-ordinate and integrate employees towards the effective implementation of corporate and functional strategies in order to deliver customer satisfaction through a process of creating motivated and customer orientated employees.*

Ferdous (2008) and Rafiq and Ahmed (2000) stated that internal marketing communication is one of the most important aspects of internal marketing. Moreover, internal marketing communication is the most critical aspect of spreading and accepting the internal marketing concept and philosophy within organizations.

Biondić et al. (2022) in their paper highlighted all the positive outcomes of quality internal communication and the negative results of poor communication. Moreover, (Biondić et al., 2022) showed that employees in Croatia are moderately satisfied with internal communication. Nevertheless, internal marketing shows the potential to impact employee motivation, attitude, behavior, and satisfaction. In their research, Terlević and Ružić (2018) highlighted that the level of IM use corresponds to the level of employee satisfaction.

In their paper, several other impacts of internal marketing have been proven; Nemteanu and Dabija (2021) demonstrated that internal marketing positively impacts job satisfaction and insignificantly impacts task performance and counterproductive work behavior. Pavlidou and Efstathiades (2020) showed that internal marketing positively affects the organizational culture (customer-oriented) of nonprofit public organizations, such as secondary public schools. Bruin et al. (2020) revealed that internal marketing (i.e., internal promotion, price, and performance management) directly impacts customer satisfaction. Imani et al. (2020) showed that internal marketing and organizational learning improve employee performance. In their literature review, Musa et al. (2021) showed that internal marketing affects product & service quality and better performance, enforces job satisfaction, and motivates employees to be more productive. Ocak and Marangoz (2019) showed that internal marketing activities positively impact employees' organizational commitment. Ocak and Marangoz (2019) argued that organizations had realized the importance of achieving high employee motivation and commitment to improving overall performance.

In addition to IM's direct impacts on different outcomes above (such as commitment and motivation), IM can as well directly influence employee satisfaction which in return can affect: employee engagement, productivity (Abdulwahab, 2016), financial performance (Hatana, 2015) and business unit outcomes (Hayes, 2002). Moreover, Rafiq and Ahmed (2003) demonstrated that the application of IM impacts satisfaction, motivation, service quality, and, finally, companies' customer satisfaction due to all these factors. In the case of a nonprofit organization, a customer can represent a voter.

Ferdous (2008) stated that academics and professionals have given much attention to internal marketing. Even though the term' internal marketing' was coined in the 1970s, authors (Musa et al. 2021) highlighted that today there is an increasing interest in the topic from scholars. Unfortunately, not many organizations apply this concept in practice because of the above mentioned variety of interpretations, definitions and visions about what internal marketing really is and how it works (Rafiq & Ahmed, 2000).

Musa et al. (2021), in their systematic review of papers addressing internal marketing in 2012 – 2021, highlighted that several research on the topic was conducted in Asia, so they encourage further research in other countries.

Furthermore, Wring (1997) highlighted the usefulness of marketing for political parties and processes. Shama (1973 in O'Cass, 1996) claimed that many concepts from goods and services marketing could be applied to political marketing. Despite these facts, there are different difficulties in transposing marketing concepts and approaches from profit to nonprofit and public organizations (e.g., political parties) (O'Cass, 1996). Ružić et al. (2016) highlighted that despite several research focused on internal marketing, there is not enough research on internal marketing use in the nonprofit and public sectors.

Based on the above, to expand knowledge in the specific field of political and internal marketing, the authors posited the following hypothesis:

H1: Internal marketing communication positively impacts the satisfaction of political party members.

3. METHODOLOGY

In order to measure the internal marketing orientation, the authors deployed a questionnaire used by Tortosa et al. (2008), which was based on the

questionnaire developed by Lingsa and Greenleya (2005) (4 dimensions). In order to investigate the level of political party members' satisfaction, items used by Johlke and Duhana (2000) and previously by Hunk et al. (1985) were used. The questionnaire was slightly adjusted to fit the purpose of the research. Questions about age, gender, and education were added. The research was conducted between January and February 2022. The research was addressed to political party members in Croatia. It was distributed via e-mail to the official e-mail addresses of all the parties represented in the Croatian parliament. The purpose of the research was explained in the body of the e-mail, and the mail recipient was asked to distribute the questionnaire to all party members. It was emphasized that the survey is anonymous. A 5-point Likert scale was used (1-strongly disagree to agree 5-strongly).

A total of 129 fully completed questionnaires were collected. Among 129 respondents, 69.8 % were male, 29.5% were female, and 0.8% chose the answer of *other genders*. Most respondents (41.9%) fell into the age group 46+, followed by (31%) in the group 36 - 41 years. In total, 22.5% of respondents were between 26 and 35 years old and only 4.7% were 16 - 25 years of age.

Regarding education, 37.2% had a master's degree, and 22.5% had a higher level of education (such as an MBA) (doctoral study not included). There was also 6.2% (8) of philosophy doctors, and 20.2% of respondents had a high school diploma.

4. RESEARCH RESULTS

Since the paper aimed to determine the impact factors of internal marketing communication on political party members' satisfaction, the authors used the PLS-SEM method. The PLS method was chosen over the CB-SEM method because the purpose of the survey is predictive and, being a non-parametric method, it is more flexible when it comes to data distribution, allows for model assessment, and provides more robust results in the data analysis of small samples (Hair et al., 2022). The software SmartPLS 4.0.9. was used in the analysis (Ringle et al., 2022). Furthermore, the internal marketing communication constructs were measured using reflective measurement models because the indicators of individual constructs can be considered a representative sample of all the possible items available within the conceptual domain of the research construct (Nunnally & Berenstein, 1994). In addition, the reflective concept of

the measurement models is also due to their solid mutual correlation and mutual interchangeability in content; hence, excluding individual items would not jeopardize the understanding of the construct (Jarvis et al., 2003). In the section below, the authors first analyzed the measurement models for the internal marketing communication and the satisfaction construct, then determined the interdependence of said constructs through structural models. Finally, importance-performance map analysis (IPMA) was used to investigate the significance and the impact of each aspect of internal marketing communication on satisfaction on the indicator level.

4.1. Analysis of the measurement and the structural model

Assessment of the measurement model for the internal marketing communication constructs consists of analyzing indicator reliability, internal consistency reliability, convergent and discriminant validity of the constructs of internal marketing communication, and political party members' satisfaction. The bootstrapping method with 10,000 subsamples (Hair et al., 2022) was used in the assessment of parameters by using the PLS-SEM method. The results of the measurement model analysis are shown in Table 1.

Table 1: Indicator reliability and convergent validity

Name	Item	Outer loadings	T-value	Outer weights	C.R.	AVE
IMC1	In this party, officials try to find out what members want	0.82*	24.19	0.08*	0.97	0.69
IMC2	In this party, when a member is not acting following set standards, officials try to find out if they have a problem	0.79*	17.01	0.08*		
IMC3	In this party, officials try to find out the members' true feelings about their activity within the party	0.83*	31.79	0.071*		
IMC4	In this party, officials often talk to members to find out about aspects of their membership and all related matters	0.86*	37.50	0.08*		
IMC5	In this party, there are regular meetings between officials and members to discuss matters that members wish to address	0.86*	37.85	0.09*		
IMC6	In this party, officials meet with members at least once a year to discuss the members' future expectations regarding their activity within the party	0.79*	23.78	0.08*		
IMC7	At this party, officials meet with members to try to find out everything that makes them feel satisfied with their activity within the party	0.89*	43.40	0.08*		
IMC8	In this party, officials normally meet with members to inform them of matters relating to the organization (objectives, strategies, etc.)	0.82*	22.54	0.07*		
IMC9	In this party, officials normally inform members about aspects affecting their activity within the party	0.79*	20.56	0.07*		
IMC10	In this party, officials inform all members	0.82*	22.09	0.07*		
IMC11	In this party, officials inform members about problems within the party that they have verified earlier	0.87*	38.13	0.08*		
IMC12	In this party, when officials find out that members are not happy with their governance of politics, they take the appropriate corrective measures	0.82*	24.75	0.07*		
IMC13	In this party, when officials receive suggestions from members, they make an effort to implement them	0.86*	35.84	0.08*		
IMC14	In this party, officials change their behavior when members communicate their dissatisfaction	0.67*	9.05	0.05*		
IMC15	After informing members, officials act to improve conditions for their political activity	0.89*	32.40	0.07*		
IMC16	Officials behave in accordance with what members expect from them	0.86*	35.80	0.08*		
SAT1	I feel that my activity at the party is valuable	0.87*	30.53	0.20*	0.94	0.73
SAT2	At my party, I feel that I am doing something worthwhile	0.89*	35.88	0.21*		
SAT3	I feel that my activity at the party is interesting	0.85*	26.12	0.17*		
SAT4	I feel that my activity at the party satisfies me	0.87*	34.73	0.21*		
SAT5	If I had to do it again, I would choose this party	0.74*	15.49	0.18*		
SAT6	In general, I am very satisfied with my activity at this party	0.89*	41.90	0.20*		

Source: authors' calculation, n=129, *p<0.05

Based on the results of the measurement model analysis, it can be concluded that the applied measurement scales show a satisfactory level of indicator and internal consistency reliability as well as convergent validity. External loadings of almost all used indicators (except for IMK14) are statistically significant (p<0.05) and higher than 0.7, while the CR and AVE values are above the recommended values of 0.7 and 0.5, respectively. Finally, the measurement scales show a satisfactory level of discriminant validity. The Fornell-Larcker (1981) criterion is satisfied because the square root of the AVE for each construct exceeds the correlation between the two constructs. Likewise, the HTMT ratio of correlations is 0.75, below the threshold limit of 0.85. After satisfying the essential criteria of validity and reliability of the measurement scales, it is possible to analyze the structural model. Based on the analysis of the structural model, it can be concluded that internal marketing communication has a positive and statistically significant (p<0.05) impact on political party members' satisfaction (β=0.719, t=14.46). The internal marketing communication construct accounts for 52% of the variance in the political party members' satisfaction construct (R^2=0.518), and the impact is relatively high (f^2=1.08). Based on the $PLS_{predict}$ algorithm, the $Q^2_{predict}$ values were calculated, and the root-mean-square error (RMSE) was compared to the Linear Regression Model benchmark (LM). All $Q^2_{predict}$ values are more significant than 0. In contrast, the RMSE values for all indicators of the endogenous satisfaction construct are more significant than the declining LM values, suggesting a high predictive validity of the structural model.

4.2. Importance-performance map analysis (IPMA) of political party members' satisfaction

In order to obtain more specific information on the impact of individual factors of internal marketing communication on political party members' satisfaction, the IPMA analysis was conducted with the PLS–SEM method. The IPMA analysis compares the total effects representing the predecessor construct's importance in predicting the target constructs and their average latent variable scores indicating their performance (Hair et al., 2018: 105). In the current survey, the IPMA analysis was conducted using the classical five-step procedure as proposed (Hair et al., 2018: 1) Checking requirements for the analysis, 2) Computation of the performance values, 3) Computation of the essential values, 4) Importance-performance map creation, and 5) Importance-performance map on the indica-

tor level. All requirements for carrying out the IPMA analysis were fulfilled. All indicators were measured with metric scales, all the indicator coding had the same scale direction, and all the outer weights had positive values.

Based on the IPMA analysis and upon computation of average importance and performance values, we can categorize both individual constructs and indicators into four groups based on their impact on the target construct (Martilla & James, 1977: 1) low importance – low performance (Low Priority attributes), 2) low importance – high performance (Possible Overkill attributes), 3) high importance – low performance (Concentrate Here attributes), and 4) high importance – high performance (Keep Up the Good Work attributes).

Since the PLS-SEM analysis included only the endogenous construct of internal marketing communication, whose importance values were 0.719 and performance values 52.14, and the positioning of the construct in the IP map was not possible, the authors analyzed the indicator level. The results of the IPM analysis are shown in Table 2.

Table 2: Results of the IPMA analysis on the indicator level

Variable	IMPORTANCE	PERFORMANCE
IMC1	0.059	60.85
IMC2	0.055	60.47
IMC3	0.048	49.42
IMC4	0.059	52.91
IMC5	0.061	53.49
IMC6	0.06	50.00
IMC7	0.06	66.67
IMC8	0.047	55.23
IMC9	0.049	51.36
IMC10	0.05	48.84
IMC11	0.057	48.45
IMC12	0.052	43.61
IMC13	0.058	50.00
IMC14	0.037	41.47
IMC15	0.055	49.81
IMC16	0.057	49.61
Average	**0.054**	**52.01**

Source: authors' calculation, n=129

Based on the results in Table 2, individual indicators of internal marketing communication can be categorized into the four groups above based on their impact on political party members' satisfaction. The results of the IPMA analysis on the indicator level are presented graphically in Figure 1.

Figure 1. IPMA analysis on the indicator level
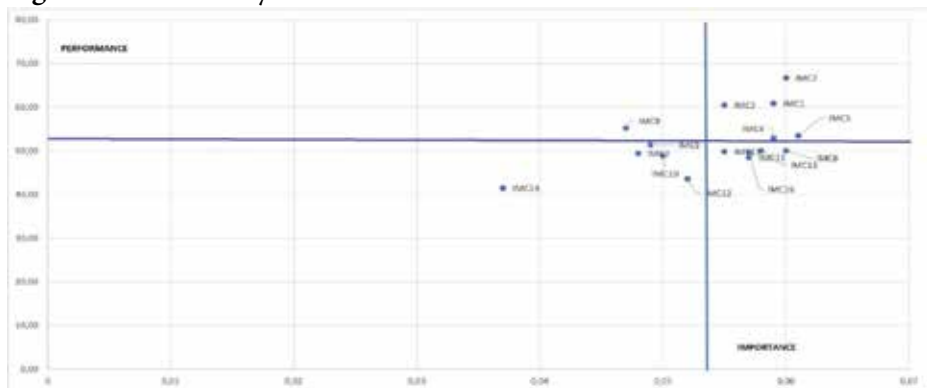
Source: authors' calculation

Thus, the low importance – low-performance group (Low Priority attributes) includes the following indicators: "In this party, officials try to find out the members' true feelings about their activity within the party" (IMC3), "In this party, officials normally inform members about aspects affecting their activity within the party" (IMC9), "In this party, officials inform all members" (IMC10), "In this party, when officials find out that members are not happy with their governance of politics, they take the appropriate corrective measures" (IMC12), and "In this party, officials change their behavior when members communicate their dissatisfaction" (IMC14). Based on the results of the analysis, political party leaders consider relatively less critical, and thus requiring less investment of time and other resources to ensure satisfaction, the variables referring to informing members about their roles within the party and to changing the behavior of the party leadership based on the feedback obtained by members. Based on the results of the analysis, the second group, low importance – high performance (Possible Overkill attributes), included only one indicator: "In this party, officials normally meet with members to inform them of matters relating to the organization (objectives, strategies, etc.) "(IMC8). In this sense, the organization of party meetings too frequently to discuss the well-known elements of the party's political activity, such as strategies and objectives, does not necessarily

have a significant impact on satisfaction. However, it most definitely wastes the party's and the leadership's resources. The third and the most important group, high importance – low performance (Concentrate Here attributes), included: "In this party, officials meet with members at least once a year to discuss the members' future expectations regarding their activity within the party" (IMC 6), "In this party, officials inform members about problems within the party that they have verified earlier" (IMC11), "In this party, when officials receive suggestions from members, they make an effort to implement them" (IMC13), "After informing members, officials act to improve conditions for their political activity" (IMC15), and "Officials behave following what members expect from them" (IMC16). Based on the factors above in this group, indicators referring to the political party's strategy of future action and, for instance, improvement of the party's rating, as well as taking steps by leaders to implement such strategies to the satisfaction of the party members, can have a significant impact.

Furthermore, lower performance, which is particularly important for creating satisfaction, was observed by members in the appropriateness of behavior of the party's leadership as perceived by members. Finally, the fourth group of indicators, high importance – high performance (Keep Up the Good Work attributes), included: "In this party, officials try to find out what members want" (IMC1), "In this party, when a member is not acting following set standards, officials try to find out if they have a problem" (IMC2), "In this party, officials often talk to members to find out about aspects of their membership and all related matters" (IMC4), "In this party, there are regular meetings between officials and members do discuss matters that members wish to address" (IMC5), and "In this party, officials meet with members at least once a year to discuss the members' future expectations regarding their activity within the party" (IMC6). The latter group of indicators that are important and have an appropriate level of performance includes the aspects of informal communication between the party's leadership and membership and indirect determination of the level of members' satisfaction as well as getting informed about the level of satisfaction of members' needs through party's activities. Based on the analysis results, it can be partially concluded that the parties' leadership is successful in informal forms of communication but relatively lacking in concrete formal procedures that should reasonably satisfy members' needs.

5. DISCUSSION AND IMPLICATIONS

Even though the term' internal marketing' was coined in the '70s, the concept is not fully implemented in practice. Nevertheless, it is gaining importance nowadays when there is a labor shortage and the economy shifts to the knowledge economy. Today, people (i.e., employees) have become the most crucial asset for firms, and theorists show salient interest in the topic. A modern concept often used among businesses today is employer branding, a contemporary evolution of internal marketing. However, it is not unexpected that the concept of internal marketing is not well-known and applied among nonprofit organizations (such as political parties), as the nonprofit sector struggles with applying approaches and concepts used in the for-profit sector.

On the other hand, the pros of satisfied employees are known. However, the results of satisfied organization members are not studied enough, and there is not enough evidence of the impact of internal marketing (especially internal marketing communication) in the nonprofit sector and among organizations such as political parties. The research results highlight interesting evidence; it has been proven that internal marketing positively impacts political party members' satisfaction. The findings align with evidence from research conducted in the for-profit sector (Rafiq & Ahmed, 2003; Ružić & Terlević, 2018; Nemteanu & Dabija, 2021). Accordingly, as internal marketing can impact the satisfaction of employees, it can also impact the satisfaction of political party members.

Moreover, the impact of employee satisfaction on customer satisfaction has been demonstrated. Hence future research should be focused on the impact of political party members' satisfaction on voters (the equivalent of the customer in political settings) and the achieved political results. Furthermore, this study shows the effects of each aspect of communication on political party members' satisfaction. Based on the research results, parties' presidents (local, regional, or national) seem to be satisfactory in informal communication. However, they should improve formal communication procedures to improve members' satisfaction.

Thanks to the results obtained, political parties' management can underpin internal marketing activities directed to their members to affect their satisfaction. Moreover, procedures, activities, and management skills can be improved. It is also worth adding that party president (i.e., top managers) should desire and encourage internal marketing activities to show the potential to bring results on a large scale.

The current study adds new insights into the not-new but still interesting concept of internal marketing, applied in the specific field of political parties. The links between internal marketing and party members' satisfaction constructs have not been studied enough. Moreover, the research provides valuable insights and explains how internal marketing affects satisfaction and how each aspect affects political party members' satisfaction.

6. CONCLUSION

People are the key to any organization. This assertion can especially apply to the nonprofit sector, where people often invest their free time, knowledge, and skills in exchange for well-being and satisfaction. In such a context, where money is not a motivator, many non-financial motivational activities should be underpinned. Good use of non-financial motivational activities can lead to outstanding results (in terms of people's impact and final results). However, first, they have to be understood and properly used. The current research offers essential knowledge in the field of internal and political marketing in the particularities of the Croatian context. However, the study has a few limitations that could be the basis for further research. Firstly, the sample used is relatively small and unbalanced regarding gender and demographic characteristics. To this end, a more extensive and better-structured sample would enable the better generalization of findings, e.g., creating an IPMA matrix by age, gender, membership in political parties, etc. Likewise, in future research, all the political parties should be included equally in the sample. Besides, the survey assumed a linear relationship between the internal marketing communication construct and the satisfaction construct, but future research should conduct IPMA analysis considering the possibility of nonlinear relationships between internal marketing communication and satisfaction. Furthermore, IPMA analysis should be carried out apart from IMC, with political party members' loyalty as the target construct. Moreover, future research should measure the impacts of IM on motivation, efforts, WOM, and similar within political parties, and the links should be tested in different cultural settings.

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EXPLORING THE IMPACT OF MARKETING AND MEDIA ON HUMANITARIAN ORGANIZATION: CONSUMER PERSPECTIVES AND COMMUNICATION CHALLENGES

Arnela NANIC, Ph.D.
University of Bihać, Faculty of Economics

E-mail: arnela.nanic@efbi.unbi.ba

Ines GREDELJ
Most recent employer United Nations Population Fund in Bosnia and Herzegovina

E-mail: ines.gredelj@gmail.com

Davorin TURKALJ, Ph.D.
 Josip Juraj Strossmayer University of Osijek, Faculty of Economics and Business in Osijek

E-mail: davorin.turkalj@gmail.com

Abstract

This study aims to investigate the impact of marketing and media on humanitarian organizations from consumer perspectives, focusing on consumer perceptions, communication challenges, and the role of social marketing strategies. The study aims to explore consumer awareness of the content they consume through digital and traditional media, their research behaviors in assessing companies' social responsibility and the operations of humanitarian organizations, and their perceptions of media ethics in reporting on humanitarian crises. Today's marketing extends far beyond the commonly held definitions and theories, encompassing various aspects of a company, organization, or brand. Its impact goes beyond stimulating consumer actions and can shape diverse outcomes. Humanitarian organizations globally conscientiously present

conflict-ridden situations in their announcements and reports, raising global awareness about possibilities for crisis resolution.

The additional aim of this study is to demonstrate that consumers possess a heightened awareness of the content they consume daily through digital and traditional media. They proactively conduct additional research to determine the true extent of companies' social responsibility, the actual operations of humanitarian organizations, and whether media outlets adhere to ethical codes in reporting on humanitarian crises or exploit them for personal gain and success.

To achieve this, an online survey was conducted in multiple countries, using a random sample of respondents from the global population. The research aims to emphasize the significance of social marketing for companies, the role of consumer perceptions towards it, and assess the actions and conduct of media outlets and humanitarian organizations. The study's limitations pertain to sample size and representativeness.

The research findings can benefit companies, humanitarian organizations, and media representatives by enhancing communication and mitigating potential communication barriers. Furthermore, companies can leverage the results to establish more effective consumer communication strategies and improve overall business performance.

Keywords: *social marketing, humanitarian crises, consumer perception*

JEL Classification: *M30, M37*

1. INTRODUCTION

Every year, unpredictable and potentially dangerous situations occur around the world that affect the quality of life of the population in that area. International companies and global humanitarian organizations can directly increase or decrease their credibility, profit, and recognition through their actions and awareness-raising efforts in these areas, depending on the marketing content they publish and their parallel actions following it.

The purpose of marketing is not only to help a company attract consumers to increase its overall profit, nor is the purpose solely to create a product or service that will meet consumers' needs. The purpose of marketing, especially service marketing, also lies in raising awareness in the community about the general welfare of society and humanitarian crises, which marketing can significantly

impact. Marketing can reach a wider audience through various media outlets and raise awareness about humanitarian crises and their impact on people and communities where they live. Various marketing strategies can significantly influence people and motivate them to donate to humanitarian organizations that help people in crises. Through the media, the wider public is informed about the flows of humanitarian crises and the activities of humanitarian organizations in response to crises.

On the other hand, marketing not only affects humanitarian organizations through various marketing campaigns in crises, but also the perception of consumers about humanitarian organizations, their activities, and their perception of organizations that are involved and actively helping to solve crises through socially responsible behavior, which will ultimately affect their action undertaking.

Therefore, the role and significance of marketing are far more significant and robust and go beyond the framework of "satisfying consumers' wants and needs and achieving profit." Marketing can be a powerful tool for raising awareness about humanitarian crises, solving the consequences of crises by collecting funds and providing assistance, and acting preventively in crises.

2. MARKETING AND GLOBAL HUMANITARIAN CRISES

2.1. Marketing and the Media in Crises

Marketing and media have a special significance in crises when market conditions and needs change significantly. AMA defines marketing as the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society (AMA, 2017). The marketing strategy is a fundamental framework for a company's current and future goals, resources, and interactions with the market, competitors, and other environmental factors (Hollensen, 2003: 3). The strategy should specify what (goals that should be achieved), where (which industries and market to focus on), how (which resources and activities to allocate to each product/market to exploit favorable market opportunities and reduce threats), to achieve a competitive advantage (Renko, 2009: 70). Meler (2005: 19) emphasizes that marketing should always lead to integral satisfaction of needs: on

the one hand, individual and aggregate consumer needs, and on the other hand, individual needs of the economic subject. He points out that it is essential to note that the fundamental goal is not and should not be profit but rather the satisfaction of socially positively valued consumer needs.

Marketing applied in crises significantly differs from usual marketing activities focused on promoting products and services and attracting customers. Crisis marketing involves the application of specific marketing strategies during natural disasters, pandemics, major economic crises, and even humanitarian crises. Crisis marketing focuses not on promoting products or services to increase demand but on raising awareness among community members to help those affected by various crises.

Therefore, marketing activities are adapted to specific crisis conditions on the market and the different needs of consumers during a crisis. Due to the crisis, marketing strategies involve adapting marketing messages, content, and media, with the aim of targeted communication, emphasizing not on selling products but on safety, support, care, and empathy towards consumers. For example, during the pandemic, we witnessed numerous promotional campaigns that focused on taking care of the health of their employees and donating funds to hospitals instead of promoting the product itself. Crisis marketing is essential in crisis management to create trust with consumers, maintain reputation, and positive consumer attitudes.

To determine a strategy that is appropriate for a particular entity, it is necessary to consider some questions that help analyze the entire situation: (Ferrell, 2021: 55)

- internal environment (overview of current goals, strategies, and performance, availability of resources, organizational culture, and structure),
- customer environment (who are our current and potential customers, what customers do with our products, where do customers buy them, when do customers buy our products, why and how do customers choose our products, why do potential customers not buy our products)
- and external environment (competition, economic growth and stability, political trends, legal and regulatory issues, ...).

2.2. Social marketing and ethics

Social marketing is becoming imperative in today's world due to changes in the external environment, especially climate change and numerous humanitarian crises. This form of marketing gains particular importance in crises. Today, consumers are much more aware of the importance of a company's social responsibility. On the global market, a growing segment of consumers prefer products from socially responsible companies. Social marketing is a form of marketing that focuses explicitly on the welfare of society. Its main goal is not to promote products or services but to promote positive social behaviors and values that lead to positive social changes. Social marketing can focus on numerous ideas, such as environmental care, violence prevention, health care during the pandemic, safe driving, and similar issues.

Therefore, social marketing aims to raise awareness of significant social issues, encourage the public to solve those problems, promote positive societal changes, and highlight socially responsible business practices. Marketing is thus strongly related to the general welfare of society and can significantly affect the outcome of crises in the market. In recent times, marketing ethics has expanded to include social aspects of ethical behavior in marketing, making social responsibility in marketing one of the essential topics in the contemporary social context (Čutura, 2016: 95). According to Kotler and Keller (2016: 686), a strong sense of ethics, values, and social responsibility must accompany effective internal marketing. It is believed that taking a more active, strategic role in social responsibility benefits customers, employees, the community, the environment, and stakeholders. Andreasen (1994: 110) defines social marketing as the adaptation of commercial marketing technologies to programs designed to influence the voluntary behavior of the target audience to improve their well-being and the well-being of the society they belong to.

Social marketing refers to a) influencing behaviors, b) using a systematic planning process that applies marketing principles and techniques, c) focusing on priority target audience segments, and d) providing positive benefits to society (Lee & Kotler, 2011: 7). There are several significant differences between social marketing and commercial marketing. In the commercial sector, the primary goal is to sell goods and services that will bring financial gain to the corporation. In social marketing, the primary goal is to influence behaviors that will contribute to social welfare. Given their focus on financial gain, commer-

cial traders often prefer to choose primary target audience segments that will ensure the highest volume of profitable sales. In social marketing, segments are chosen based on different criteria, including the prevalence of social problems, the ability to reach the audience, readiness for change, and more (Lee & Kotler, 2011: 14).

Ethics is a broad field of study that examines moral principles and values that govern individual and group behavior. In marketing, ethics refers to moral principles and values guiding marketers' decisions and actions. Marketing ethics involves examining ethical issues in the marketing process and determining what actions are morally right or wrong. Marketing ethics also involves considering the impact of marketing activities on society, the environment, and other stakeholders.

3. GLOBAL HUMANITARIAN CRISES

Humanitarian crises have, unfortunately, existed since ancient times. The rise of global humanitarian emergencies and situations significantly threatens people's safety and quality of life worldwide. Marketing plays an important role, both in the prosperity of a company and in the lives of people experiencing crises. Marketing activities can help raise awareness among the global population about specific crises, which will be further explained in the empirical section. The United Nations Human Rights Agency differentiates humanitarian crises and humanitarian emergencies as follows (Taxonomy Term Humanitarian Crisis: 1):

"A humanitarian crisis is an individual event or series of events that endanger the health, safety, or well-being of a community or larger group. This can be an internal or external conflict and typically occurs over a large land area. A humanitarian emergency is an event or series of events that present a critical threat to the health, safety, security, or well-being of a community or other large group of people, usually over a wide area."

3.1. Humanitarian, non-profit and NGOs

Although seemingly similar terms may even be synonyms for the average person, humanitarian, non-profit, and nongovernmental organizations repre-

sent three different types of organizations that have similar and/or identical goals.

A non-profit organization (NPO) is not driven by profit but rather by a dedication to a goal that is the focus of all revenue beyond what is needed to run the organization. Non-profit organizations are often used for funds, cooperatives, advocacy, charitable, environmental, and religious groups. Many, but not all, nongovernmental organizations have paid staff in leadership positions; almost all utilize volunteers. Unlike for-profit businesses, nongovernmental organizations do not have owners, and any surplus profits after operating expenses are used to achieve goals rather than being distributed among members or employees of the organization. (Hanna, 2022)

Humanitarian organizations are entities whose mission is to prevent and/or alleviate human suffering in armed conflicts. They are typically involved in searching for, collecting, and transporting the wounded and sick, missing, and dead; providing medical assistance to the wounded and sick; assisting prisoners of war; and aiding the civilian population through humanitarian assistance. They are sometimes also referred to as impartial humanitarian bodies. (International Committee of Red Cross)

Nongovernmental organizations, or NGOs, were first referred to as such in Article 71 of the Charter of the newly formed United Nations in 1945. They are defined as a non-profit, voluntary group of citizens organized at the local, national, or international level to address issues that support the public good. (UNDPI, 1945)

While nongovernmental organizations do not have a fixed or formal definition, they are generally defined as non-profit entities independent of government influence (although they may receive government funding). Generally, the NGO label is given to organizations that operate at the international level, although some countries classify their civil society groups as NGOs. NGO activities include but are not limited to, environmental, social, advocacy, and human rights work.

They may work to promote social or political change on a broader level or very locally. Nongovernmental organizations are crucial in society's development, community improvement, and citizen participation.

According to statistical data and predictions from the United Nations Office for Humanitarian Affairs, it was estimated in November 2021 that 274 million people will require humanitarian assistance and protection in 2022 (Global Humanitarian Overview, 2021).

The International Rescue Committee (IRC) subsequently published its 2022 Emergency Watchlist, a global ranking of humanitarian crises expected to worsen the most in the current year. Most countries on the watchlist, especially the top ten, have experienced almost uninterrupted conflict over the past decade, hindering their ability to respond to global challenges such as COVID-19 and climate change.

By combining the analysis of 66 different indexes and databases with insights from over 30,000 staff and volunteers of the IRC working in crisis zones worldwide, the IRC assesses countries at risk of "human threats" (political instability, armed conflict, economic collapse) and "natural threats" (floods, earthquakes, diseases). This approach, tested and proven effective, enables the IRC to identify countries at the greatest risk of significant deterioration in the humanitarian situation in the coming year. These ten countries are home to 10% of the world's population but account for 89% of those needing humanitarian assistance worldwide. The global emergency watchlist for 2022 was compiled before the Russian invasion of Ukraine (International Rescue Committee, 2022).

3.3. Humanitarian crises in Bosnia and Herzegovina

Although global statistical websites such as the International Rescue Committee do not provide information or statistical data on humanitarian crises in Bosnia and Herzegovina in the last ten years, individual investigations of reports from agencies such as UNHCR, UNFPA, IOM, and others reveal some information on the situation in Bosnia and Herzegovina.

In particular, from 2018 until now, Bosnia and Herzegovina has been a temporary residence for thousands of migrants and refugees from war-torn areas, countries facing economic, social and/or health system crises. As of the beginning of 2022, Bosnia and Herzegovina has accepted several hundred refugees from Ukraine.

It is essential to note the difference between "migrants" and "refugees." Migrants are defined as any person who crosses international borders or resides within a country, regardless of their legal status, whether the movement is voluntary, what caused it, and how long the stay is (The International Organization for Migration). Refugees have already been granted protection from persecution, as they come from war-torn or life-threatening areas. Refugees have the right to international protection while seeking asylum is a human right that guarantees that anyone can enter another country and request asylum (UN Convention, 1951).

As of September 11, 2022, 14,134 asylum seekers, refugees, and migrants have arrived in Bosnia and Herzegovina, representing an increase of 16% from 12,213 arrivals during the same period in 2021. (UN Refugee Agency in BiH).

4. RESULTS OF THE EMPIRICAL RESEARCH AND DISCUSSION

4.1. Methodology and sample of the research

The research methodology is based on an online survey created using Google Forms software. 399 (N=399) respondents completed the questionnaire. The survey was created in two versions: one in Bosnian and the other in English to conduct the research globally. The research on this topic was conducted by an online survey consisting of questions through which the respondents expressed their agreement or disagreement and personal thoughts on the subject in question.

The research was conducted from October 20, 2022, to April 1, 2023. Among the respondents were students, high school students, employees of global humanitarian agencies (UN), media companies (AlJazeera and others), psychologists, marketing experts, and average consumers to better understand the global perception of the connection between marketing and crises. Regarding the countries, the majority of respondents come from Bosnia and Herzegovina, while the smallest number of respondents, only one respondent from each, come from the following countries: Finland, Greece, Slovakia, Switzerland, the United States, Australia, Germany, Russia, and Ukraine.

The following section presents an analysis of the sample structure of the participants who participated in the empirical research.

Table 1. Sample structure

Features	N	(%)
Gender		
Male	126	31.57%
Female	273	68.42%
Age group		
> 18	3	0.75%
18 - 25	117	29.3%
25 - 35	120	30%
35 - 50	93	23.3%
50 +	66	16.5%
Country of residence		
Bosnia and Herzegovina	218	54.63%
Croatia	50	12.5%
Serbia	21	5.2%
Montenegro	19	4.76%
Kosovo	7	1.75%
USA	52	13%
Others	32	8%

Source: Authors

The online questionnaire had 399 participants, 273 female (68.4%) and 126 male respondents (31.57%). Most responses came from the 25 to 35 age group, accounting for 30% of the total answers. The research revealed that consumers distinguish between marketing content provided and actual company efforts. Respondents emphasized that an aesthetically pleasing campaign alone cannot overshadow business oversights in social responsibility actions. Lack of investment or disregard for social responsibility and consumer concerns significantly decrease interest in a content provider, organization or brand. This study highlighted the importance of transparent information in marketing content and strategy design, successfully demonstrated through the questionnaire responses.

Table 2. Results of the research (Likert scale)

	N	(%)
1. How much do you trust organizations and media companies? (Credibility of work, statements, announcements...)		
Do not trust them at all (1)	31	7.7%
I mainly do not trust them	52	13%
Neutral	192	48.12%
I mostly trust them	96	24%
I trust them completely (5)	28	7%
2. Humanitarian organizations adhere to ethical and moral values in their work		
Strongly disagree	21	5.2%
Disagree	87	21.8%
Neither disagree nor agree	142	35.58%
Agree	96	24%
Strongly agree	53	13.28%
3. Media houses adhere to ethical and moral values in their work		
Strongly disagree	81	20.3%
Disagree	127	31.8%
Neither disagree nor agree	122	30.57%
Agree	52	13%
Strongly agree	17	4.26%
4. Humanitarian organizations genuinely help people		
Strongly disagree	51	12.78%
Disagree	67	16.79%
Neither disagree nor agree	106	26.56%
Agree	101	25.3%
Strongly agree	74	18.54%
5. Media houses objectively and truthfully present events in the country/world		
Strongly disagree	113	28.32%
Disagree	137	34.33%
Neither disagree nor agree	85	21.3%
Agree	36	9%
Strongly agree	28	7%
6. The media can influence and/or change the opinion of a citizen		
Strongly disagree	15	3.75%
Disagree	37	9.27%
Neither disagree nor agree	65	16.29%
Agree	93	23.3%
Strongly agree	189	47.36%
7. Marketing advertising can help through positive images and encouraging messages, not just graphic images		
Strongly disagree	12	3%
Disagree	49	12.28%
Neither disagree nor agree	83	20.8%
Agree	135	33.83%

Strongly agree	120	30%
8. Some humanitarian crises attract global attention, while others do not.		
True	367	91.97%
False	32	8%
9. The attention of the media, organizations and well-known companies can change the dynamics of the crisis.		
True	340	85.21%
False	59	14.78%
10. A TV report gives me enough information about an event/situation		
Strongly disagree	82	20.55%
Disagree	129	32.3%
Neither disagree nor agree	120	30%
Agree	51	12.78%
Strongly agree	17	4.26%
11. I do not research information myself		
Strongly disagree	131	32.83%
Disagree	87	21.8%
Neither disagree nor agree	95	23.8%
Agree	55	13.7%
Strongly agree	31	7.77%
12. The content that organizations publish affects my trust in them		
Strongly disagree	28	7%
Disagree	87	21.8%
Neither disagree nor agree	131	32.83%
Agree	79	19.79%
Strongly agree	74	18.54%
13. The actions and activity of humanitarian organizations affect my trust in them		
Strongly disagree	11	2.75%
Disagree	32	8%
Neither disagree nor agree	158	39.6%
Agree	73	18.29%
Strongly agree	131	32.83%
14. Marketing contributes to raising customers' awareness of the company's social responsibility		
Strongly disagree	28	7%
Disagree	61	15.28%
Neither disagree nor agree	109	27.31%
Agree	76	19%
Strongly agree	125	31.32%
15. I prefer buying products/services from socially responsible brands		
Strongly disagree	33	8.27%
Disagree	45	11.27%
Neither disagree nor agree	70	17.54%
Agree	69	17.29%
Strongly agree	182	45.61%

Analyzing the obtained research results, we come to clear conclusions. The highest degree of disagreement among respondents was expressed for the following statements:

Media companies present events in the country/world objectively and truthfully. As many as 62.65% of respondents did not agree with this statement, while only 16% agreed with it. This indicates a high level of mistrust toward the objectivity and credibility of media companies.

I buy products from companies even though they publicly support something I disagree with (occupation of Palestine, aggression towards Ukraine, etc.). As many as 60.58% of the total number of respondents did not agree with this statement, while only 18.78% of respondents agreed with it.

The highest degree of agreement among respondents was found in the following statement: *Media can influence and/or change the opinion of citizens.* As many as 70.66% of respondents agreed with this statement, indicating the respondents' awareness of the significant influence of the media on opinion and purchasing decisions.

The mandatory open-ended question where respondents could express their honest opinion through a short sentence or longer paragraph was: *"Why don't you trust media companies?"* Most answers were concise, serious, and critically oriented, while only a few were less professional. Some of the responses are listed in the following section:

"Many organizations and media companies have sponsors or investors (either in the open or behind closed doors) that influence how their money and attention are spent. Those influences can be altruistic or politically or socially motivated (say religious organizations proselytize as they assist, or political forces exert pressure or focus a one-sided story)."

"Because all media companies prefer profit over truth and often report on ultimately insignificant things."

"I think that a lot of information and numbers remain undiscovered to the public to protect the image of the organization/media company, and the reason for this is political propaganda. This provides us with information we want to hear and changes our awareness in their favor."

The most common reason for distrust among individuals is not the content that these subjects present and publish, but rather their refusal to provide con-

sumers with the information they do not publish, as well as reasons why they do not publish it (subjectivity, "neutrality," manipulation). This is not just a local problem but a global one, as most respondents, regardless of their country of origin, said the same thing differently: They do not trust them because they know they are not truthful.

Answers related to the statement *"Media can influence and/or change citizens' opinions"* (statements 2-7 in Table 2) represent a clear picture that shows the vast majority of people worldwide share the opinion that what they read, see, or hear does indeed affect their perception. From this, it can be concluded that marketing is one of the most critical processes in the work and operation of every company or organization.

Most respondents (85.21%) agreed with the statement that *"Media attention, organization, and well-known companies can change the dynamics of a crisis."*

The next part of the questions (items 10-13) connects the direct influence of certain marketing content and its consequences on consumers' minds and decisions made after exposure to that content. The research results show that many respondents investigate information independently after the initial information they read/heard from a company, humanitarian organization, or media outlet. This is significant because it means that individuals worldwide do not unthinkingly follow trends, or "someone else's" opinion is easily imposed on them. They primarily value transparency and facts and prefer to invest their time and effort in obtaining authentic and truthful information.

The last part of the questionnaire was also an open-ended question: *"What is your opinion on the influence of marketing on global humanitarian crises?"* One of the most critical questions in the questionnaire was completely open and non-obligatory. In no way were descriptions or photos used to influence the creation of responses, nor were respondents given examples to facilitate writing a response. This way, freedom of expression was fully preserved, and respondents could write whatever they felt was necessary and appropriate. Over 65% of respondents answered this question. Some of the written responses are listed in the following section.

"I believe that most of the world's humanitarian organizations can be very helpful during crises, but I also believe that not all the information we receive is entirely credible or true. Media outlets during a crisis publish any form of sensational news, whether true or not, to increase viewership, attract attention,

and manipulate the population. Marketing and direct communication with the consumer can greatly impact shaping people's awareness and image of the same."

"Their influence is increasing in small steps, but it is still very low. Communication is mostly directed at the wrong target groups."

The respondents' high response rate, honesty, and descriptive responses have created a clear, realistic picture of the global perception of marketing and its importance. The development of technology has greatly facilitated the process of accessing information, making research and verification of that information easier. Answers to this question indicate that regardless of the level of development of the country in which they are located, individuals are well aware of the harsh reality of the world, manipulation by certain entities, and the use of unpleasant events for their benefit.

Consumers emphasize the importance of humanity, ethics, and empathy when using marketing for any purpose and do not hesitate to express their opinions. Regardless of the content, who, or how it is presented, we can never be sure if it accurately represents an event or attempts to manipulate us without fact-checking first. Therefore, by analyzing the survey results, we can conclude that marketing, media and content creation significantly impact global humanitarian crises and consumer perception of it.

5. CONCLUSION

The use of marketing by media companies and humanitarian, nongovernmental, and non-profit organizations should not be ignored. The content they publish and use is, in its purpose, a form of marketing, but it often needs to be understood as such by consumers or followers. Media outlets and humanitarian organizations often report on conflicts, fatal events, and humanitarian crises worldwide, but their focus shifts from active community support to consumer interest, which can create a counter-effect.

The research findings indicate a high level of mistrust towards media companies, with most respondents disagreeing that media presents events objectively and truthfully. Similarly, respondents were reluctant to support companies that publicly endorse causes they disagree with. However, respondents acknowledged the significant influence of media in shaping opinions and purchasing

decisions. The reasons for distrust in media were concerns over subjectivity, neutrality, and manipulation.

Furthermore, the study revealed that individuals globally value transparency and seek authentic and truthful information. After initial exposure to marketing content from companies, humanitarian organizations, or media outlets, they were willing to investigate information independently. The respondents recognized the potential impact of media attention, organization, and well-known companies on changing the dynamics of a crisis.

Research findings provide valuable implications for the marketing of humanitarian organizations that emphasize the importance of humanity, ethics, and empathy in marketing efforts. Consumers emphasize the need for transparent and responsible communication from humanitarian organizations. They expect organizations to prioritize authenticity and truthfulness rather than prioritizing media engagement and profit. Additionally, respondents emphasized the significance of clear and accurate information in marketing content related to global humanitarian crises.

There are certain limitations of this study. The limitation in conducting empirical research refers to the sample size and regional distribution, so the results cannot be generalized and used globally. The limitation is also related to the lack of previous research, which makes it impossible to compare with the results of conducted research. In this regard, the recommendation for further research would be to investigate specific strategies that can enhance transparency and authenticity in marketing content, particularly for humanitarian organizations, explore the role of social media platforms in shaping consumer perceptions of global humanitarian crises and the effectiveness of marketing campaigns or to examine the long-term effects of marketing efforts on consumer trust and loyalty towards humanitarian organizations.

Overall, these research findings have significant implications for marketing practices within humanitarian organizations. Understanding consumer perceptions, media distrust, and transparency's importance can help organizations create effective and ethical marketing strategies that resonate with their target audience.

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ANALYZING THE COST AND NECESSITY OF THE FIGHT AGAINST DISINFORMATION FROM THE NATIONAL SECURITY PERSPECTIVE

Zvonko TRZUN, Ph.D.
Croatian Military Academy "Dr Franjo Tuđman"

E-mail: zvonko.trzun@morh.hr

Dijana GRACIN, Ph.D.
Croatian Military Academy "Dr Franjo Tuđman"

E-mail: dijana.gracin@morh.hr

Tina ŠTENGL
Croatian Military Academy "Dr Franjo Tuđman"

E-mail: tina.orlovic@morh.hr

Abstract

The paper examines the impact of disinformation campaigns on national security, underlining the various threats they pose, including the spread of panic, the weakening of trust in institutions, interpersonal trust, and financial losses. In extreme cases, disinformation could fuel riots and conflicts or completely destabilize societies. Disinformation can influence political processes, promote authoritarian ideas to the detriment of democratic ones, and undermine previously accepted values. Using the example of the recent pandemic, it is shown that disinformation can also lead to serious health problems, especially in cases where incorrect information is spread about medical treatments or the alleged dangers of using vaccines. All mentioned threats directly relate to the costs of combating disinformation, whereby these costs can be measured or estimated based on the available literature and published reports. Finally, it is shown that efforts to stop the spread of disinformation require significant resources, but they are nevertheless justified in order to preserve a sound security environment.

1. INTRODUCTION

The spread of disinformation and the jamming of communication channels is one of the biggest problems of modern technologies, now accompanied by severe repercussions. Disinformation causes political, social, security, economic, health, and personal damage. Therefore, the question arises: can these damages be assessed at the global and national levels, and can the costs of combating disinformation be estimated? What threats are posed if attempts are not made to stop or at least limit the spread of disinformation? Moreover, finally, what is the estimated ratio of costs incurred by disinformation authors compared to the costs borne by those fighting against them?

Disinformation has undergone a comprehensive evolutionary process, transforming from entertainment or minor annoyance to a potent weapon wielded by malicious actors. Even the definition of disinformation speaks of its potentially destructive effect. Unlike misinformation and misinformation, disinformation brings false data with the undeniable intent to cause harm (Wardle & Derakhshan, 2017). Similarly, Kshetri and Voas (2017) define two primary forms of false information: misinformation and disinformation. With premeditation as a main distinction, misinformation is unpremeditated false information, and disinformation is deliberate and planned false information.

Figure 1. Difference between disinformation, misinformation, and malinformation
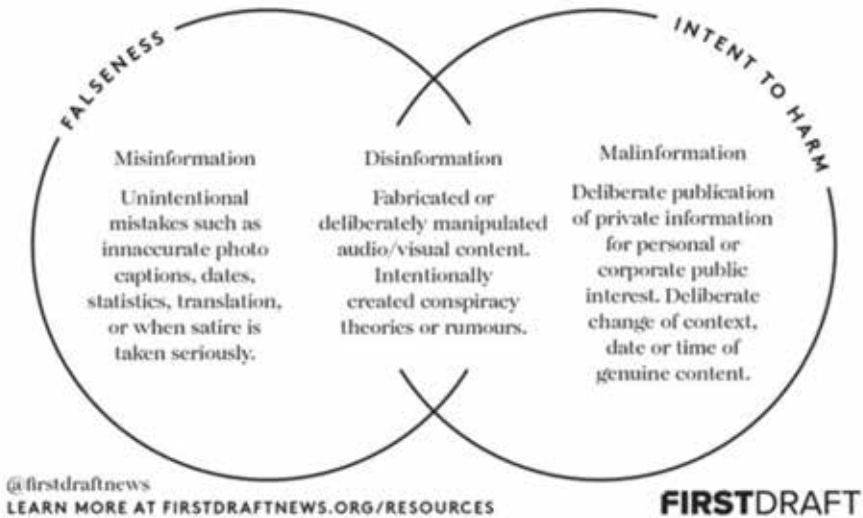
Threats to previously accepted democratic values appeared in the first decades of the new century. New ideas have entered the public discourse and undermine today's public, political, and even security space. Populism-driven politicians have increased their global influence, mutually fueling each other. Unfortunately, all these polluters of public communications now have a wide variety of tools (incomparable to the tools available in the past) that they freely use to spread their views worldwide in real-time (Brun & Roitman, 2020). For example, with its array of advertising tools and options, digital marketing has increased information dissemination speed and reach significantly. Additionally, social media platforms allow targeted advertising to specific groups of users, consequently allowing the targeted spread of disinformation. According to Guilbeault (2018), digital marketing drives disinformation, with domestic and non-domestic actors exploiting its influence mechanisms.

The longitudinal study of false news online by Vosoughi, Roy, and Aral (2018) showed that false information was spread significantly faster and broader than the truth, with false political news having the most pronounced effect. The study found that the truth took six times longer than disinformation to reach 1500 people, where news about politics is among the fastest spreading and with more extensive reach than other news categories. The study also

showed that bots do not have a determining role in spreading disinformation, and although they accelerate the spread, the human contribution outweighs the automated robots.

According to Walker and Matsa (2021), every second American gets news on social media, with Facebook being a primary source. Considering the nature of social media algorithms and advertising, social media can quickly and easily become a dangerous tool and platform for spreading disinformation.

However, despite all efforts, it is clear that the fight against disinformation will be burdensome because the Internet constantly opens new loopholes for individuals and organizations that try to spread false claims. Disinformation is often spread through social media and other online platforms, creating utterly new disinformation networks that operate outside traditional media and institutions (Rabb et al., 2022), which naturally weakens formal institutions' influence on the formation of public opinion.

There is growing recognition among governments worldwide of the harmful nature of disinformation, prompting them to pursue all available means to combat this phenomenon. As a crucial measure to counter disinformation campaigns, governmental bodies implement ever more stringent legislation. Those laws specifically hold technology companies responsible for distributing inaccurate information. A notable example is internet ads that enable the spread of disinformation. At the same time, their authors remain unknown - which would not be possible if the managers of social platforms introduced the necessary verification of the ads' content. The laws also hold social media users accountable for spreading false information, especially if it is clear that those users were aware of the true nature and potential harm of the disinformation they were spreading (Vasu et al., 2018).

2. DISINFORMATION CAMPAIGNS AND NATIONAL SECURITY

Different definitions of national security exist, but they typically revolve around safeguarding the safety and well-being of citizens from significant threats (Murphy & Topel, 2013). A comparable definition is provided by Moros (2020), where national security encompasses measures aimed at upholding national interests, including the protection of vital interests of individuals, soci-

ety, and the state, which determine the nation's aspiration for self-preservation and long-term growth.

Disinformation can have severe consequences for national security; the following shows some possible dangers.

2.1. Destabilization of Government Institutions

Collaboration between state institutions and society becomes crucial during crises or challenging times, which can be defined in various ways. These situations often jeopardize society's fundamental rights and freedoms, previously guaranteed or taken for granted.

Disinformation can seriously influence public opinion and institutional trust. In extreme conditions, loss of trust in the government and political systems can result in political instability and conflicts.

For example, disinformation on electoral processes can doubt their validity (Bader, 2018), weakening trust in institutions assigned to preserve fair democratic processes. Disinformation on the judiciary and police services can lead to a sense of injustice and violation of human rights. The weakening of trust in the institutions is a sinking spiral because the public is not ready to communicate with institutions they consider unfair; this further reduces institutions' credibility and, at the same time, reduces the willingness of the public to communicate and cooperate with institutions. In this descending spiral, institutional trust and the willingness of the public to cooperate fall together until the final breakdown.

A recent example of the disinformation effect is the invasion of the angry mob on the US Congress building, where attackers were encouraged by the constant incitement from former US President D. Trump. By the time of the attack, extreme Trump supporters embraced the idea that government institutions were swamped by corruption and malicious supporters of the Democratic Party. However, Trump never provided valid evidence for such claims. More about the dynamics of emotions exchanged by different user groups on social networks can be found in (Jakubik et al., 2022). Given the apparent untruthfulness of these claims and, at the same time, its intentions of causing damage, Trump's claims thoroughly qualify to be proclaimed as disinformation.

When combined with other factors, such as increasing inequality and deteriorating social cohesion, a lack of trust in institutions can impede the effectiveness of reform policies and hinder cooperation between economies. The promotion of protectionist and anti-globalization sentiments can exacerbate this. Therefore APEC (Asia-Pacific Economic Cooperation), in its 2020 report, declares disinformation to be an unquestionable regional economic problem that may cause harmful societal and economic harm (San Andres, 2020).

2.2. Loss of Trust in Healthcare Institutions / Systems

Implementing lockdowns and social distancing measures has led to the emergence of post-traumatic stress disorder (PTSD) symptoms such as anxiety, sleep disorders, and distress. Dissemination of disinformation also helped develop PTSD (Tagliabue, Galassi, and Mariani, 2020). Disinformation concerning the aftereffect and composition of the vaccine, or even the existence of the COVID virus, also led to a lack of trust in the health system and consequently to the fall of the public's willingness to cooperate with institutions and their efforts. The Center for Countering Digital Hate conducted a separate analysis to explore the background of the distribution of disinformation (Center for Countering Digital Hate, 2021). While there is a widespread impression that a significant number of individuals are responsible for generating content opposed to vaccination and COVID-19 treatment, only a small group of individuals or anonymous entities are accountable. According to this research, the majority of anti-vaccine content can be traced back to just 12 profiles on social media. Given the significant amount of time and effort required to produce and disseminate disinformation on such a massive scale, it is reasonable to assume that this is the product of a well-organized campaign involving entire organizations.

In addition to a decreased trust in institutions (described in part 2.1), disinformation is also worsening communication at a personal level. That is, they inflict significant damage to interpersonal trust. This leads to the isolation of individuals and universal polarization and distrust in society. Social capital is lost as one of the fundamental values that enable the normal functioning of the nation - which is directly reflected in the deterioration of national security.

Of course, not all parts of society are equally susceptible to such disinformation. Therefore attackers targeted precisely those groups predicted to be the easiest to accept false claims (Escolà-Gascón et al., 2023).

2.3. Undermining National Unity

Disinformation can divide society on ethnic, religious, or political grounds, leading to societal division and undermining national unity. This can threaten national security as the society may become divided on issues of common national interest. Disinformation campaigns can create "different versions of the truth", resulting in a polarization of society. One part of society uncritically accepts false interpretations, while others see them as a challenge or even an insult – where all of these depend clearly on previously accepted beliefs (Löfflmann, 2021).

Elections are a particularly vulnerable time in democratic countries. These are the most critical moments when citizens get the opportunity to express their values, and the public becomes polarized more than ever. However, not only are the interests of citizens conflicted but also of various lobbies and political organizations, including foreign governments, that strive to secure the victory for the candidate they prefer. Such conditions make election campaigns fertile ground for the spread of malicious disinformation, even at the cost of further disruption of national unity (Frau-Meigs, 2020).

2.4. Causing Financial Losses

Disinformation can affect the national economy by destabilizing financial markets, affecting the currency's value, reducing consumer and investor confidence, and causing economic losses. False information placed at a particularly unfavorable time can cause damage not only to individual companies or people but to the entire given sector or national market as a whole (Christov, 2019). Political documents today often define national security in a broader framework, considering developments in the international system and other economic, ecological, and social factors. Even if there is no single definition of national security, more and more countries explicitly include non-military aspects of security (for example, economic security) in their strategic documents. Therefore, it can be stated that the weakening of the state's economy also directly affects its security. In contrast, disinformation aimed at disrupting one and/or another system (economic and national security) represents a threat that needs to be responded to as soon as possible (Retter et al., 2020).

2.5. New Era of Disinformation

The development of artificial intelligence (AI) and its wide applications started a new era of disinformation. Enabling the generation of realistic images, videos, and text, AI made it easier than ever to spread false narratives and influence public opinion. The use of AI to generate disinformation has severe and far-reaching consequences, making the development of countering strategies a priority.

One of how AI is used to generate disinformation is *deep fake* technology. Deepfakes are manipulated videos or images using AI algorithms to replace one person's face with someone else's face and change its mimics. This technology can spread disinformation to discredit individuals (Westerlund, 2019) or whole political parties and regimes. The danger of deep fakes lies in their ability to create convincing videos and images that are hard to tell apart from the real ones.

In their behavioral study, Köbis, Doležalová, and Soraperra (2021) demonstrated that people could not reliably detect deep fakes and overestimate their detection abilities. Another way an AI can generate and spread disinformation is through chatbots. Chatbots are computer programs simulating conversations with human users. They have posed as real people and have been used to manipulate public opinion on social media to influence political outcomes, particularly elections. AI is also being used to quickly and easily generate fake news articles, which can be quickly spread through social media and other online platforms.

However, despite the increasing role of AI in creating and disseminating disinformation, the influence of human users remains of prime importance. Bots indeed play a significant role in the propagation of disinformation, but a study (Vosoughi, Roy & Aral, 2018) has demonstrated that their impact is not decisive. Instead, disinformation dissemination's primary source and channel remain human, with AI merely expediting the process.

3. METHODS AND COST OF THE FIGHT AGAINST DISINFORMATION

3.1. Strategies

The new era of disinformation fueled by AI requires adapting strategies for combating disinformation. Some strategies that could be used are developing

AI algorithms for deep fakes, disinformation, and chatbot detection. These algorithms could be integrated into social media and other online platforms for easier identification and removal of disinformation.

However, without neglecting the importance of new technologies, the fundamental strategy for exposing disinformation is educating the *public in media literacy and critical thinking skills*.

Numerous reports, for example (Waltzman, 2017), confirm such reasoning. These reports accentuate the improvement of media literacy and discuss the tactics that attackers use to identify vulnerable individuals within society and to overflow them with disinformation that supports the attacker's agenda. Moreover, as can be predicted, many of those targeted fail to recognize the ulterior motives behind attacks due to psychological and sociological factors.

The typical attacker's tactic involves dividing the population into distinct groups and then identifying individuals within each group most susceptible to certain types of messaging. From there, attackers can determine which narrative will be most easily embraced. Through ongoing monitoring and adapting their strategy, attackers can successfully propagate their ideas and manipulate the targeted group.

The systematic review of Carnegie (Yadav, 2020) shows that most researchers focus on recommendations for fighting disinformation on governments and industry actors. The author also lists the most frequently cited recommendations for countering influence operations (disinformation spread campaigns), where the exchange of true information, media literacy, supporting local/independent fact-checkers, and increased platform regulations are most often recommended.

According to the European Commission report (Commission and Directorate-General for Communications Networks, 2018), a multi-dimensional approach based on five pillars is recommended: enhanced transparency of online news; promotion of media and information literacy; development of tools for empowering users and journalists to combat disinformation; safeguarding the diversity and sustainability of European news media ecosystem; continuance of research on the impact of disinformation and adjustment of responses. Similarly, a group of authors (Pherson, Mort Ranta & Cannon, 2021) propose a strategy matrix for combating disinformation (Figure 2).

Figure 2. A four-strategy matrix for combating disinformation in digital space based on key drivers

Source: Pherson, Mort Ranta and Cannon, 2021

Fact-checking can reduce the impact of disinformation on beliefs, although studies find varying efficiency of the interventions depending on the type of disinformation (Courchesne, Ilhardt & Shapiro, 2021). Improving media literacy remains undisputed as the best and most influential of all the mentioned strategies.

3.2. Cost of Fighting Disinformation.

The fight against disinformation entails high costs. In order to be able to recognize and fight against disinformation campaigns successfully, all "defensive participants" of the information process (governments, media outlets, and business entities) must invest significant funds to develop the necessary tools and resources.

For instance, European University Institute and the Calouste Gulbenkian Foundation established the European Media and Information Fund with the objective of multidisciplinary disinformation research, strengthening media literacy and fact-checking, and distributing €10.5 million in grants to fight disinformation in 2022. and 2023 (European University Institute, 2021). Recognizing the challenge of fighting disinformation, YouTube and Google awarded a $13.2 million grant to the International Fact-Checking Network in 2022.

All this is just a drop in the ocean compared to the funds invested by the world's largest platforms. Facebook has a variety of initiatives to help its community deal with disinformation, including its News Integrity Initiative and partnerships with fact-checking organizations. According to Facebook CEO

Mark Zuckerberg, the Facebook budget for safety mechanisms is bigger than Twitter's income for 2022 (Feiner & Rodriguez, 2019). Knowing that Twitter's revenue is in the billions ($4.4 billion in 2022), Facebook spends several billion dollars annually to fight against disinformation and its authors.

Given all the negative phenomena associated with disinformation poisoning, it is probably pointless to discuss whether the costs of fighting against them are worth it. A recent Korean study (Jo et al., 2022) depicts human nature in a very plastic way. When asked how much they are personally willing to spend to combat disinformation, Korean respondents offer a relatively low amount annually. However, as the authors of the study note, this amount increases sharply among respondents who have already suffered some damage due to disinformation. A conservative estimate of the study shows, therefore, that the South Korean government alone could allocate almost $200 million to the mentioned fight (against disinformation), which is an amount that should be kept in mind and used to protect domestic society.

Although these payouts may seem high, they are still significantly lower than the potential damages. The UK study (Duke et al., 2020) shows that only in the United Kingdom during the six months of 2020, 21,947 COVID-19 cases, 2,187 hospitalizations, and 509 deaths were recorded - all directly attributable to online disinformation. As a result, the NHS (National Health Service) faced additional health costs of £22.1 million. In comparison, the indirect impact of disinformation on the UK economy is estimated at a staggering £3.6 billion in quarter two and quarter 3 of 2020.

As already stated, technological advances, and AI in particular, can be used to spread disinformation, but on the other hand, it can also be used to help control its spread. According to the United National Interregional Crime and Justice Research Institute, technology specialists are lately devising novel solutions to detect the propagation of widespread disinformation by utilizing data science, Big Data visualization, and machine learning (ML). These cutting-edge technologies enable researchers to visualize the dissemination of disinformation and potentially trace the source of misleading narratives (Gradon et al., 2021).

Of course, the use of high-end technology also carries high costs: 1) cost aggregated during the initial stages of programs when it is necessary to acquire the appropriate equipment and develop applications capable of independently

recognizing disinformation; and 2) costs incurred during the later stages of programs (i.e., during the implementation of developed human and AI resources).

The major challenge presents *the low cost of producing and spreading disinformation instead of the high cost of combating it*. Social media platforms paired with AI applications made disinformation's high-velocity creation and spread possible, where the low cost of disinformation and anonymity attracts those seeking to influence public opinion.

A study published by the well-known multinational cybersecurity software company Trend Micro (Gu, Kropotov & Yarochkin, 2017) shows how attackers plan, finance, and execute disinformation campaigns. In the beginning, the authors show three components that campaigns must include to succeed - the so-called fake news (or disinformation) triangle. Three factors must be present in this triangle: motivation of attackers, social networks as the best platforms through which disinformation spreads, and finally, tools and services that facilitate the implementation of the campaign (e.g., automatic bots, pages for writing texts filled with false claims, etc.). Such sites are advertised on underground and gray marketplaces and offer meager prices for creating or distributing attacker-favored propaganda. For only US$15, it is possible to order a 500 to 800-word article, while another service offers to get the customer 5000 followers for only $66. For $55,000, anonymous attackers offer to discredit an unwilling journalist completely. For $200,000, they will help spark street protests. For $400,000, they offer to completely manipulate a decisive course of action and influence the choices in a decision-making process: personal financial decisions, referendums, trade agreements, and even elections. This means that for tens or hundreds of thousands of dollars, it is possible to create disinformation operations to drive decisions that can later cause millions or billions of dollars in damage.

The following part of the paper presents some examples of disinformation campaigns aimed at Croatian society.

4. DISINFORMATION OPERATIONS EXAMPLES – CASE STUDY CROATIA

Since disinformation campaigns are present in almost all countries, they can also be registered in Croatia.

Based on recent research findings, an indirect assessment can be made to determine the susceptibility of the Croatian public to disinformation. The spread of disinformation is found to be faster and less controlled in new media, such as the internet and social media, in comparison to traditional media like TV, radio, and printing press, as highlighted in various studies including (Kaliyar, Goswami & Narang, 2021). Therefore our study focuses on the content and information shared through social networks. Using the Eurobarometer report (Eurobarometer, 2022), we conclude that the Croatian public is at risk because traditional media, except TV, have become less influential in information dissemination. Instead, the internet, particularly social networks, has emerged as the primary source of information in Croatia, with a significantly higher percentage than the EU27 average, as depicted in Figure 3. The presented chart is the author's original work, made according to data from (Eurobarometer, 2022).

Figure 3: What media have Croatian respondents used the most to access news in the past seven days? Multiple answers allowed
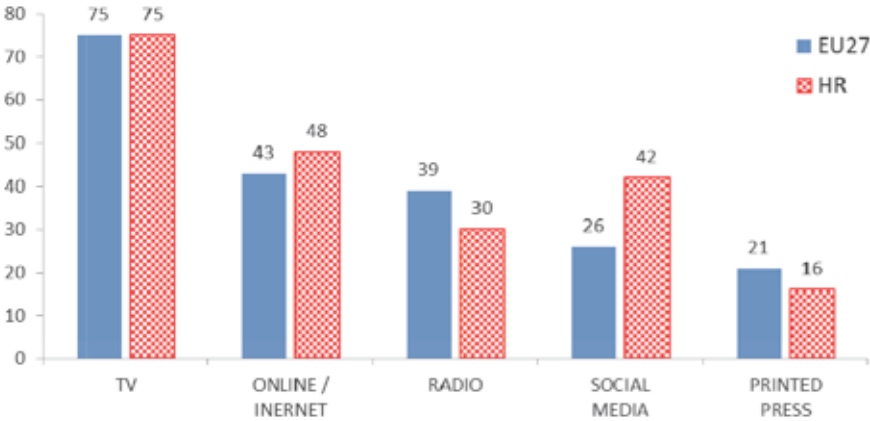
Due to the increased reliance on the Internet and social networks as primary sources of information, it is not surprising that Croatian respondents report being targeted more frequently by attacks and attempts to deceive them with disinformation (Figure 4). The presented chart is the author's original work, made according to data from (Eurobarometer, 2022).

Figure 4: What percentage of Croatian respondents believe they have been personally exposed to disinformation and fake news in the past seven days
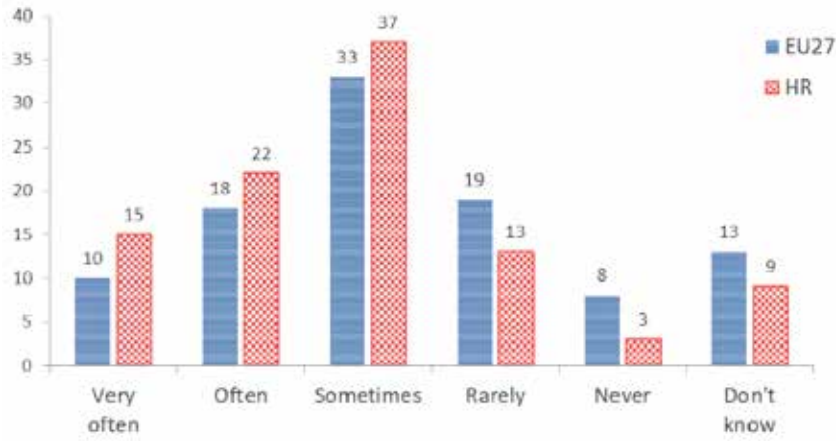
Despite the large number of attacks, Croatian respondents express slightly higher confidence (compared to the EU27 average) that they would be able to recognize disinformation. Before making conclusions about the validity of such self-belief (Figure 5), a broader analysis is needed that will examine the ability of the Croatian public to identify and expose the disinformation being disseminated to them. The presented chart is the author's original work, made according to data from (Eurobarometer, 2022).

Figure 5: What percentage of Croatian respondents feel confident in their ability to recognize disinformation when they encounter it
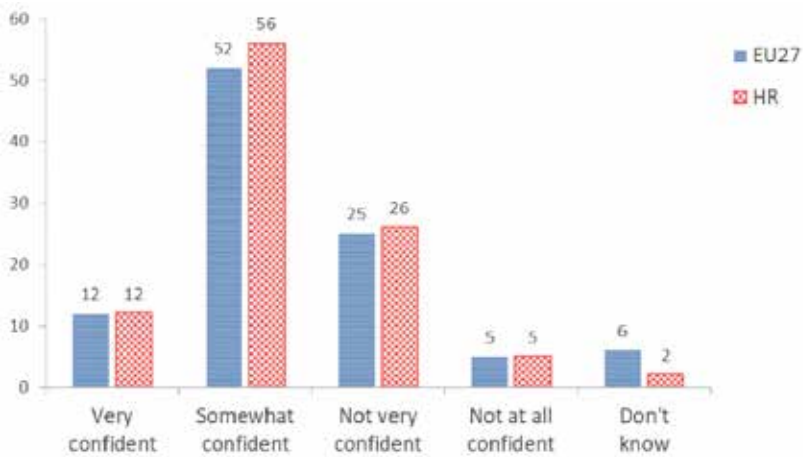
Below are some examples of disinformation campaigns observed in recent years.

4.1. COVID-19 Related Disinformation Campaigns – the Analysis

Croatia has also fallen prey to controversial conspiracy theories surrounding the COVID-19 pandemic. These theories range from the claim that the virus is entirely fictitious to the belief that it is a harmless ailment causing only mild symptoms and is in no way fatal. Some theories even suggest that the pandemic is a ploy of the globalist elite to gain control over the world population. All these theories share the common thread of rejecting the medically established need for vaccination. The vaccine has been labeled fake, inadequately tested, and hazardous to health. Misleading accounts, often anonymous confessions from healthcare workers "who witnessed countless vaccine-related casualties," circulated via social media. Fake medical advice, such as the one that vinegar and baking soda could cure the infection, or the claim that vaccines cause autism, has also been spread. The outcome of these conspiracy theories has been a significant decline in support for public health institutions.

The fight against harmful COVID-19-related disinformation is not only a Croatian but also a worldwide known problem (Ellison et al., 2003). In 2020, T.A. Ghebreyesus, the Director-General of the World Health Organization, acknowledged that the world was fighting an epidemic and an "infodemic". State institutions have only limited options to respond adequately, which is a general problem applicable to almost all countries. According to the report by West, Juneau and Amarasingam (2021) the true national security implications of malicious online activities are not fully understood. This highlights that the threat landscape is evolving so rapidly that it could potentially surpass the government's capacity to evaluate, respond to, and prevent emerging issues. In Croatia, the problem of fighting disinformation is deficiently covered by existing legal solutions, and there exists only one article (Article 16) of the Law on Offenses Against Public Order and Peace, written back in 1994 and prescribing low penalties for disseminating disinformation. In the previous version of the Criminal Code, which was in force until 2013, there was a criminal offense of "spreading false and disturbing rumors", but it no longer exists in the current Criminal Code. Although in the last two years the police filed 32 indictments before local

courts for inventing or spreading false information about the coronavirus, the outcome of those cases, as well as the possibility of actually stopping the malicious attackers, remains arguable. Table 1 shows the assessment of the "anti-vaccine" disinformation campaign.

Table 1. Analysis of the "anti-vaccine" disinformation campaign

The awake emotional solid response?	Yes (both positive and negative)
Authors of disinformation (attackers)	Unknown
Real motives of attackers	Unknown
Potential threats (if the campaign became successful)	Deterioration of the nation's health condition, financial losses, reduction of trust in government institutions
Represents a threat to national security?	Yes
Assessment of the campaign success:	Medium mainly affects people already inclined to believe in conspiracy theories

4.2. Disinformation about Croatian History – the Analysis

From multiple accounts on social networks, anonymous attackers consistently spread claims about events in modern Croatian history that "were different than official science teaches." For example, around the Day of Victory and Homeland Thanksgiving, claims are regularly made that the military-police operation "Storm" is part of a joint criminal enterprise. In doing so, the actual or alleged criminal acts committed by members of the Croatian Army during Operation Storm are cited, with an increasingly noticeable exaggeration in the number of such acts over time. It is not mentioned that the Republic of Croatia and the International Criminal Tribunal for the former Yugoslavia have, in the meantime, prosecuted the perpetrators of these shameful criminal offenses. Also, the entire historical context is not mentioned at all, for example, the years of illegal occupation of Croatian territory or crimes committed against the Croatian population years earlier – which even today is still considered to be one of Europe's deadliest conflicts since WWII (DellaVigna et al., 2014). These disinformation campaigns aim to devalue the Homeland War's success and the Croatian army's victory, weaken national enthusiasm, and divide Croatian society. These information warfare techniques are well covered in (Burwell, 2000) or (Johannesson, 2020). An additional goal is to permanently maintain discontent and a desire for revenge among those who were dissatisfied with the outcome of the Homeland War, which is also a well-known technique of information warfare, described, for example in (Noor et al., 2017) and (Jensen, Atwell Seate

& James, 2020). Multiple social network profiles and internet sources cite anti-Croatian articles originating from certain Serbian media outlets, a phenomenon that has been identified and corroborated by international institutions' analyses (RSF, 2021) and (Duffy & Green, 2020). The assessment of the "alternative history" campaign is shown in Table 2.

Table 2. Analysis of the "alternative history" disinformation campaign

Awake strong emotional response?	Yes (positive and negative)
Authors of disinformation (attackers)	Mostly Serbian tabloids (RSF, 2021)
Real motives of attackers	Impeding the normalization of relations between neighboring countries
Potential threats (if the campaign became successful)	Undermining national unity and relations between two countries
Represents a threat to national security?	Probably not unless there is further tightening of the vocabulary
Assessment of the campaign success:	Medium; affects only people dissatisfied with the outcome of the Homeland War

4.3. Accepting the Pro-Kremlin Narrative – the Analysis

Since the beginning of the Russian aggression against Ukraine, some Croatian media have reported on conflicts with genuine sympathy for the Russian side or antipathy for the Ukrainian government and fighters. So, for example, we have read about "Ukrainian neo-Nazis" fighting against the Russian army. We have also read that President Putin is only sending special forces to protect the pro-Russian population in Ukraine. Russian claims were uncritically accepted, and all of this at a time when the Kremlin government openly talks about Ukraine as a fictitious state and then calls for its "complete denazification". How Russian propaganda directs even everyday language in Ukraine can be found in (Fortuin, 2022). Therefore the uncritical acceptance of the propaganda terms "neo-Nazis", "genocide", etc., is politically irresponsible (Yurkova, 2018). Especially should Croatian media be able to see through this kind of rhetoric because Croatian people also heard proclamations about the "necessity of occupation of Croatian territory in the name of protection of the endangered people", as well as claims about the "neo-Nazi character of the Croatian state". All stories that directly or indirectly relativize guilt for Russian aggression (such as in the nineties, which were supposed to justify the aggression of the Serbia-

governed army) should be called by their proper name: the malicious spread of disinformation. Table 3 shows the assessment of the "pro-Kremlin" campaign.

Table 3. Analysis of the "pro-Kremlin" disinformation campaign

Awakes strong emotional response?	Low or medium
Authors of disinformation (attackers)	Unknown
Real motives of attackers	Causing indifference to unjust Russian aggression
Potential threats (if the campaign became successful)	Undermining national unity, moving Croatian society away from NATO and EU values
Represents a threat to national security?	Probably not unless there is further tightening of the vocabulary
Assessment of the campaign success:	Low

5. CONCLUSION

Given the multitude of threats inherent in disinformation campaigns, it is evident that they should not be ignored. Learned lessons show that the spread of disinformation needs to be limited before it causes irreparable damage.

We examined the spread of disinformation and countermeasures according to two criteria: consumption of resources and possible threats. We found a significant disparity between the costs incurred by authors of disinformation campaigns, who often operate under modest conditions but with a strong motivation to promote their goals and the cost incurred by those who fight against disinformation (commercial, governmental, and non-governmental organizations). While the spending of the campaign starters often does not exceed a few hundred or thousand dollars, the abovementioned organizations' expenditures reach multimillion-dollar. In this disparity, we found a plausible explanation for why it is exceedingly difficult to eradicate disinformation from the public communication sphere.

Authors of disinformation also use artificial intelligence, which gives them new possibilities, including the automatic creation of multiple contents with the same (false) message and the low-cost emulation of a larger sympathizers group. Fortunately, AI can also be used to help control the spread of disinformation. New, cutting-edge technologies enable researchers to visualize the trail of false narratives, tracing it to the source.

To demonstrate these theoretical concepts, we employed Croatia as a case study. We find the high susceptibility of the Croatian public to disinformation campaigns, based on the prevalent reliance on new media platforms, such as websites and social networks, as the primary source of information. Numerous studies show that information shared on social networks is inadequately controlled and can reach a broad audience, providing malicious actors with an opportunity to spread large volumes of disinformation.

The findings of the recent surveys indeed reveal that a considerable portion of the Croatian public is exposed to disinformation, significantly more than the EU27 average. Despite these undeniable risks, most Croatian respondents still express confidence in recognizing disinformation. Additional research that we plan for the future will test the validity of such confidence.

Three disinformation campaigns aimed at the Croatian public were analyzed in this paper, each according to six criteria: 1) does the campaign evoke a strong emotional response; 2) who are the most likely authors of disinformation (attackers); 3) what are the true motives of the attackers; 4) what are the potential threats (if the campaign was successful); 5) does the campaign represents the threat to the Croatian national security; 6) what is the assessment of the success of the campaign. Regarding the threats associated with the campaigns, we recognize the undermining of national unity, deterioration of the nation's health status, financial losses, erosion of trust in government institutions, and distancing Croatian society from NATO and EU values.

By applying the six listed criteria, we found that the effectiveness of each campaign varies and is heavily reliant on the level of emotional engagement induced in the target audience. For instance, the pro-Kremlin narrative campaign did not succeed due to the relatively low emotional engagement of the Croatian public. Conversely, the campaign aimed at disseminating disinformation related to the COVID-19 pandemic has been notably more successful, attributable to the arousal of intense emotions, such as hatred towards the pharmaceutical companies that draw profit from producing vaccines and from imposing the mandatory vaccination.

Based on all three campaigns, we found evidence that the fight against disinformation remains an ongoing (and resources-demanding) challenge. However, the threats associated with not taking adequate countermeasures are too severe.

AI and other modern technologies could be useful in detecting and countering disinformation, but they are not a panacea. Only with a collaborative and multi-faceted approach it is possible to mitigate the harmful effects of disinformation and safeguard national security and integrity.

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SOCIALLY RESPONSIBLE BUSINESS AND MARKETING: THE INITIATORS OF POSITIVE CHANGES IN CONSUMER BEHAVIOR

Marina GUZOVSKI, Ph.D.
Libertas International University

E-mail: mguzovski@libertas.hr

Mirko SMOLJIĆ, Ph.D.
University North

E-mail: msmoljic@unin.hr

Sanja BIRAČ
Libertas International University

E-mail: sbirac@libertas.hr

Abstract

Socially responsible business is an integral part of the company's business strategies, which are applied through certain activities in achieving long-term business goals to achieve a competitive advantage and positive effects related to caring for the community and the environment in which they operate. They try to point out as many benefits of socially responsible business as well as the change in behavior of individuals to contribute to the betterment of the environment in which they are through various marketing communication activities in building relationships with stakeholders from consumers, suppliers, investors and others; via educating, informing, through sponsorships, scholarships, pointing out various problems in the environment etc. The task of socially responsible marketing is not easy since it requires a change of behavior in individuals, and each change requires effort, easier or harder to accept or reject.

The paper presents the concept of socially responsible business and socially responsible marketing through synergistic action and the impact on the environment in which the activities are carried out. The research results on the impact of socially responsible business and socially responsible marketing on changes in consumer behavior, habits and attitudes, the application of green marketing and changes in socially responsible behavior are also presented.

Keywords: *socially responsible business, socially responsible marketing, relationship marketing, consumer behavior*

JEL Classification: *M31*

1. INTRODUCTION

Socially responsible businesses, through internal and external dimensions and social marketing together, can influence the improvement of the community. The activities affect a change in consciousness, emphasizing values, rational use of resources, environmental preservation, nature protection, influencing the quality of life, sustainability and more. Every change, even a small one, in an individual's behavior is significant for preserving the environment.

In this entire process of joint action, on the one hand, they strive to satisfy the interests of consumers in satisfying their needs, and on the other hand, companies with as little harmful impact on the environment as possible. By implementing various activities of socially responsible business, numerous benefits are realized for the company, society, and the community in which it operates. The environment and the public are informed, problems within the community are pointed out, financial aid is collected for charitable purposes, various events are sponsored, students and pupils receive scholarships, employees are provided with opportunities for growth and development in the company, their ideas and opinions are respected, care is taken about the rational use of resources, quality of life and preservation of the environment along with economic growth and the achievement of competitive advantage.

In addition to numerous activities and opportunities through all marketing mix elements, companies carry out socially responsible business activities and thereby influence environmental changes. The entire processes are oriented towards planning and implementing all elements of the marketing mix to reduce the harmful impact on the environment to achieve a competitive advantage.

Competitive advantage is gained in a way that the company is more effective and successful in attracting customers and gaining trust in the chosen product, affecting satisfaction and, consequently, loyalty and repeat purchases. Innovations are one of the primary sources of competitive advantages, and it is precisely in the field of green marketing and socially responsible activities that companies can be innovative and influence consumer trust.

The purpose of this paper is to show that the concept of socially responsible business and socially responsible marketing through joint action can be the initiators of positive changes in the behavior and habits of consumers. The research aims to determine to what extent changes in consumer behavior and thinking for the betterment of the community in which they live are encouraged through certain activities of socially responsible business and socially responsible marketing. Based on the results of the research and analysis, certain conclusions and reflections were made, as well as recommendations for additional activities and research, taking into account the limitations of the research.

2. LITERATURE REVIEW

Socially responsible business as a concept is not a new concept. It experienced its most significant development and application between 1960 and 1970 (Vrdoljak Raguž & Hazdovac, 2014). The application itself leads to a strengthening of awareness of social responsibility as a basis for achieving success and protecting the community due to various influences such as globalization, the influence of technology, educated and informed consumers, innovations, an informed citizenry as well as the growth of demand for socially sensitive investments (Lacković Vincek, Dvorski & Novak, 2017). According to Petričević (2014), socially responsible business is a concept that companies use to demonstrate social responsibility towards all stakeholders involved in their business. They use this concept as their strategy and promote care for society and the environment in their business.

Glavočević et al. (2013) state that socially responsible operations of companies affect competitiveness through higher market shares, free advertising, increased productivity and satisfaction of employees, and loyal customers. At the same time, they do something good for society. Kotler and Lee (2009) state that companies that participate in socially responsible activities achieve various benefits, some of which are higher sales and the creation of a larger market share,

the established brand is strengthened, and the image in society is strengthened. According to Krkač (2007), the key questions that companies should work out when defining their social responsibility policy relate to: the existence of ethical (business) codes, workplace relations, the environmental protection component, community involvement, the impact of activities on health and safety, respect for the right to diversity as well as the impact of business on the development of the local economy. According to Matešić et al. (2015), it is a form of behavior accepted as a way of communicating and practicing responsibility towards scarce global resources and the expectations of society and civil society organizations towards the business sector. Pavić-Rogošić (2014) states in his work that socially responsible business does not apply only to the company but also outside the company to the local community and various stakeholders (in addition to employees and shareholders): business partners and suppliers, consumers, public administration, local associations etc., that is, that it implies an internal and external dimension. All activities related to employees, which include investing in human capital, health, safety, adaptation to changes, positive impact on the environment and natural resources, and relations with partners, suppliers and consumers, refer to the internal dimension of socially responsible business. The external dimension includes the local community, relationships with consumers, suppliers and partners, human rights, and care for the environment on a global level. In their work, Tolušić et al. (2014) state that the internal dimension of social responsibility, which refers to technologies that do not pollute the environment, better working conditions and employee education, as well as building good relations with employees, will contribute to greater productivity and competitiveness.

Applying the concept of social responsibility and behavior affects recognition, image, positioning, brand promotion, and differentiation concerning the competition (Guzovski, 2021). Responsible business behavior encourages responsible consumer behavior and demand for products that pollute the environment less. By working together, they contribute to the betterment of the surrounding community. Guzovski and Smoljić (2019) state in their work that through the application of socially responsible business and green marketing, companies can achieve a competitive advantage in the differentiation of products and services in the competitive market, and with these activities, raise awareness of environmental protection, responsible behavior, environmental sustainability, etc. Ham et al. (2016) state that socially responsible business is a

concept of sustainable development by which business entities contribute to the sustainable development of the community, where the concept of social responsibility refers to a model of behavior that includes four dimensions: economic, legal, political, voluntary and discretionary responsibility. Legal norms regulate the issue of environmental protection as well as sustainability. They prescribe the principles of environmental protection from various impacts, the entities that implement them, documents and instruments for monitoring the situation and reporting, the information system and access to information, participation and information the public, as well as responsibility for adverse impacts, administrative and inspection supervision, and others. A prerequisite for sustainable development is knowledge and education, i.e., education of residents through a formal or informal system of education through the media so that education for sustainable development is an integral part of everyday life. The socially responsible business opens numerous ideas for innovation, new perspectives and experiences, new clients, new product needs, etc.

The modern way of life, climate change, industrialization, water and air pollution, biodiversity, uncontrolled waste disposal and other factors are increasingly affecting the population, flora and fauna, and the environment we live in. All these influences have negative consequences on the quality of life, leading to changes in thinking about activities that will reduce the negative impacts on the environment in which we live. On the one hand, socially responsible operations of business entities are needed, and on the other hand, a change in the behavior of individuals. Only by working together can positive changes be achieved and negative impacts on the environment reduced, as well as changing awareness regarding green thinking and influencing sustainability. According to Nefat (2015), sustainable marketing refers to all those activities that work to preserve the natural environment and human well-being, where the power of marketing is used to achieve a global culture of sustainability, thereby creating profit, as well as a prerequisite for achieving a sustainable society, not just competitive advantages.

Papadas et al. (2017) talk about the importance of green marketing in sustainable business strategies of companies within three dimensions: strategic, tactical and internal for achieving better business results. Polonsky (2011) emphasizes a helpful definition of green marketing that creates value for individuals and society by restoring and improving the environment, thereby improving the quality of life.

According to Previšić (2007), green marketing is one in which all marketing activities are designed and implemented in such a way that they take into account how they will affect society and the environment, that is, that products and services that satisfy the needs and wishes of consumers have a minimal harmful impact on the environment. The ability to maintain a balance with the ability to meet the needs of today without endangering future generations, is sustainable development. Sustainable development implies an economic dimension in terms of improving the quality of life, a social dimension in terms of preserving natural resources for future generations, and an ecological dimension in terms of preserving natural resources and the environment (Guzovski, 2022). Systematic planning of green marketing activities refers to rational consumption, more accessible and technologically equipped production, distribution, product promotion, environmentally friendly packaging and product improvement to minimize environmental harmful effects.

Pujari et al. (2003) discuss the effective development of new, environmentally improved (or more environmentally friendly) products that will be key in creating successful environmental protection strategies and help move companies and economies towards environmental sustainability. They cite other positive effects that include: increased sales, customer feedback, development of customer relationships, increased competitiveness and improved company image. Gleim et al. (2023) discuss socially responsible business as a strategic marketing perspective for consumption in a more socially or environmentally acceptable way. Sustainable marketing strategies also improve the company's image and are effective if consumers consider them valuable and essential for them and the environment.

Green products have a less harmful effect on the overall environment and human health, for the production of which natural resources are rationally used, products from recycled materials, energy saving, etc., are friendly to the environment in all processes, from production, use and disposal. Mishra et al. (2019) state that buying a green product is similar to purchasing any other product in which consumers are informed about the product, its composition, and its effect on the environment. Consumers who choose organic products, in addition to preserving nature, also think about preserving their health. Today, consumers are becoming more aware of certain products' harmfulness to their health and the environment. The packaging of ecological products has a reduced harmful impact on the environment, ensures environmental sustainability and develop-

ment, is practical, can be recycled or reused, is degradable, does not contain toxic and environmentally harmful substances, etc.

Green communication is an attempt to positively influence the change in consumer behavior and get everyone to behave responsibly. In promotional messages, i.e., green communication, some forms of communication with consumers are connecting products and environmental protection, promoting a healthy lifestyle without direct connection with the product, and creating an image of socially responsible behavior and environmental protection. Nakić (2014) states in his work that attitudes are a complex psychological category that can be influenced to a certain extent through elements of promotion. Therefore, if attitudes are influenced, consumer behavior is also influenced. It is essential to understand the consumer and choose the right approach. Through integrated marketing communication, the goal is to influence or direct the behavior of consumers (targets), which implies communication with potential customers at a particular time in such a way as to influence behavior, use one or more forms of communication, build long-term relationships, communication starts from the consumer or potential customer, the realization of synergistic effects (Kesić, 2003).

Information and education are essential factors influencing the level of knowledge, support and understanding of the public about the importance of protecting nature and the environment and raising the quality of life through direct or indirect activities of all community stakeholders. Marketing communication should be directed toward specific target groups. The key is a good knowledge of consumers, their interests and preferences to encourage responsible behavior for preserving the environment through education, information, and pointing out the benefits of changed behavior.

3. METHODOLOGY

The methodology used in the work explains in more detail the work's purpose, goal and structure. In the first part of the paper, through a literature review, the concept of socially responsible business and the impact on the environment in which it is applied is presented. This part also discusses the impact of socially responsible marketing on changes in consumer behavior.

The results of the research on the influence of socially responsible business and socially responsible marketing on changing habits, behavior and attitudes of consumers are presented in the third part of the paper and refer to the research questions: Does socially responsible business affect the improvement of the community in which it is carried out? Does corporate social responsibility influence the change in consumer habits and behavior? Does the message of socially responsible marketing influence thinking about changes in behavior? Which are the messages of socially responsible marketing the most noticeable through media?

Research on the impact of socially responsible business and marketing on positive changes in consumer behavior was conducted through a survey questionnaire for one month, in March 2023, to obtain answers to research questions and confirm or refute hypotheses. The questionnaire was conducted online using a Google Forms form and was sent to 180 addresses. The response rate is 77.77%, i.e., 140 correctly completed questionnaires were returned. The survey questionnaire contained questions related to research questions and stated claims. Respondents agreed or disagreed with the statements from 1 to 5, where 1 indicated complete disagreement, and 5 indicated complete agreement with the statement. The research was conducted on a random sample in the territory of the Republic of Croatia. The results are presented graphically, followed by an interpretation of the results.

In the final part of the work, the main conclusions are presented concerning the research questions based on the conducted research, the research limitations are presented, and further recommendations are given.

4. RESEARCH RESULTS AND ANALYSIS

One hundred forty respondents participated in the research, of which 65% were women and 35% were men. Between the ages of 18 and 25, 25 respondents participated (18%); from 26 to 33 years, 36 respondents participated (26%); from 34 to 41 years, 40 respondents participated (29%); from 42 to 51 years participated was 23 respondents (16%), ten respondents (7%) from 52 to 61 years of age participated, six respondents (4%) from 62 and older participated.

Concerning the level of education, most of the respondents have completed higher and higher vocational education (34%), followed by respondents with

secondary vocational education (31%), following are respondents who obtained a master's degree in profession or science, 26% of them and 7% of the respondents have completed a doctorate in science, and only 1.42% of respondents have completed elementary school. According to the employment structure, 48.5% of the respondents are employed, 32.9% are unemployed, 14.28% are students, 2.9% are retired, and 1.42% indicated other.

In the continuation of the questionnaire, respondents were asked What the concept of socially responsible business means to them? For 33.57% of respondents, socially responsible business is caring for the environment; for 30% of respondents, it refers to caring for the community, society, and people; for 17.86% of respondents, it is caring for employees; for 11.43% of respondents it is successful business, and 7.14% stated none of the above. The structure of the answers is shown in Figure 1.

Figure 1. Understanding the concept of socially responsible business Source: author's research
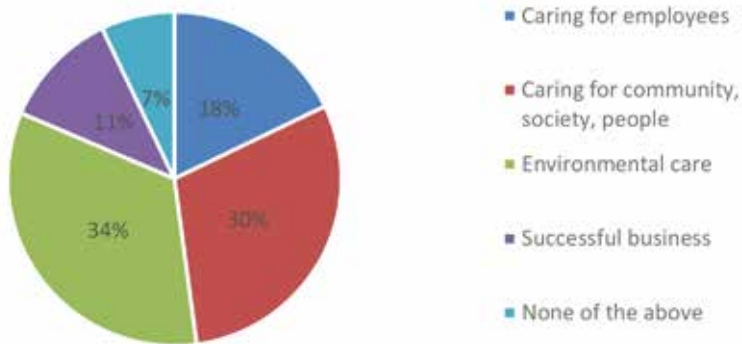
Based on the answers collected, it is evident that respondents associate the concept of socially responsible business mainly with the external dimension related to the environment and the company's activities related to the betterment of the community (a total of 63.57% of respondents). Every built facility, manifestation, student scholarship, waste recycling for a more beautiful city and nature conservation contributes to the quality of the community and the betterment of each individual's life. A third of the respondents understood the term socially responsible business to include activities related to the internal dimension, which includes taking care of employees and successful business operations.

When asked in the questionnaire through which media they most noticed ads related to ecological products and socially responsible behavior (and to choose one predominant answer), the respondents gave the following structure of answers: television 26.43% of respondents, radio 12.86% of respondents, newspapers 17.86%, digital media 32.86% and other 10.00%. The structure of the answers is shown in Figure 2.

Figure 2. Media through which consumers received messages about ecological products and socially responsible behavior
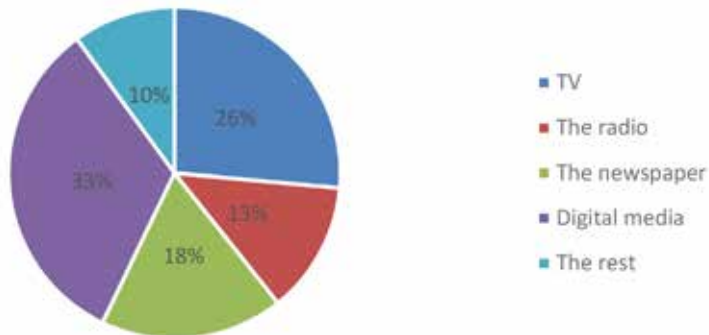
Source: author's research

Messages that inform and educate consumers about the benefits and values of socially responsible behavior and ecological products are transmitted through different media. Most respondents noticed these messages through digital media in various forms. Communication messages encouraged 30.71% of respondents to reflect and change their behavior completely, while 35.71% partially changed their behavior. 28.57 % of the respondents declared that the media had no influence on them in this sense, while 5% declared that they had none of the above.

From the given answers, we can conclude that the messages of socially responsible marketing encourage thinking and changing behavior. Pointing out the benefits and values of the changed behavior is critical to these messages. Any change in the behavior of an established habit in the consumer requires his involvement and time to adopt the new behavior. Adopting a new habit and responsible behavior is, in fact, a renunciation of previous habits, which causes discomfort, renunciation, and a change in the established habit in the consum-

er. That is why persistence in communication and pointing out the benefits of changed behavior are essential.

Furthermore, in the questionnaire, the respondents declared themselves concerning the statements made. The table shows the results of agreement or disagreement with the statement, where 1 means - I completely disagree, and 5 - I completely agree. The results in the table are expressed as a percentage. The statements in the table refer to some activities that are carried out within the framework of corporate social responsibility, which can influence a positive change in consumer behavior, such as participation in events, acceptance of digital documentation, invoices, statements, etc. instead of paper ones, use of cloth and reusable bags when going to the store instead of buying plastic bags, separating waste, buying products in packaging that is less harmful to the environment, and more. The media also covered the activities and showed how a small change in individual behavior could positively affect changes in the environment and, thus, the community where consumers live. The structure of the answers is shown in Table 1.

Table 1. Agreeing/disagreeing with the statements

Claims	1	2	3	4	5
The application of socially responsible business (participation in the organization of events, humanitarian purposes, scholarships for pupils or students, waste recycling, care for employees, etc.) affects the betterment of the community in which it is carried out	15.71%	8.57%	18.57%	30.00%	27.14%
The introduction of paper bags (instead of plastic) when shopping has an impact on consumers and changes their behavior	12.86%	15.00%	25.00%	25.71%	21.43%
I separate waste because it contributes to reduced environmental pollution	9.29%	10.71%	15.71%	25.71%	38.57%
Digitization of business (e-invoices, documentation, statements, etc.) is a positive example of unnecessary use of resources	5.71%	7.86%	25.00%	26.43%	35.00%
When buying, I choose products with ecological labels	11.43%	20.00%	24.29%	25.00%	19.29%
I support actions that have a positive impact on the betterment of the community	23.57%	20.00%	23.57%	19.29%	13.57%

Source: author's research

Concerning the statement, 57.14% of respondents mostly or completely agree that the application of socially responsible business (participation in organizing events, humanitarian purposes, student scholarships, waste recycling, caring for employees, etc.) affects the community's improvement. 47.14% of respondents believe that the introduction of paper bags (instead of plastic) in some stores has influenced their behavior and that they have started using reusable bags more often, as well as choosing products with ecological labels when shopping (44.29%) because they have a positive impact on the environment. 61.43% of respondents consider digitizing business as unnecessary use of resources and sending invoices and other documentation in paper form as a positive, socially responsible practice. When shopping, 44.9% of respondents choose products with ecological labels, while 64.28% of respondents separate waste because it contributes to reducing environmental pollution. 32.86% of respondents support actions that positively influence community improvement.

It is evident from the results that the respondents support the mentioned activities. Through communication messages about socially responsible behavior and these activities, more than half of the respondents were encouraged to reflect on and change their behavior (shown in the analysis of the previous question).

4.1. Research analysis

Some people have strong views and do not want to change them, but still, more are ready to change their habits with quality education and training. Numerous problems in the environment and negative influences lead to changes in thinking towards nature and a change in consciousness in terms of green thinking. Consumers who choose organic products, in addition to preserving nature, also think about preserving their health. Today, consumers are becoming more aware of certain products' harmfulness to their health and the environment. Changing attitudes is most often influenced by quality communication, which should be directed as much as possible to those groups of consumers who need to change their behavior in terms of separating waste, supporting various actions, buying products with ecological labels, and the like, and who do so occasionally or never.

After the research, it is evident that socially responsible business, according to the respondents, affects the improvement of the community in which it

is implemented, both in external and internal dimensions. The activities carried out affect changes in the behavior of the respondents. Socially responsible marketing that points out the benefits and values of changed behavior impacts consumers and drives them to change.

Based on the conducted research and obtained results, the main recommendations and conclusions of the work were given:

- Socially responsible business operations of companies influence the change in habits, attitudes and behavior of consumers
- Consumers consider activities carried out within the framework of socially responsible business to be positive because this affects the improvement of the community in which they live.
- It is necessary to intensify the activities of socially responsible marketing through education and information about the positive effects of changed behavior.
- Direct marketing communication to specific target groups sometimes changes their behavior or never adopts the message transmission medium.
- Educate young generations about responsible behavior.
- Encourage the involvement of consumers in actions that will improve their environment.

As consumers are increasingly aware of the consequences of irresponsible behavior, they are ready to change their behavior, thus protecting the environment in which they live and its environment, thinking of their health as well.

5. LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

When interpreting the research, the research's limitations should be considered, considering that the research was conducted on a random sample of 140 respondents who voluntarily wanted to fill out the survey questionnaire. Descriptive statistics were used in the paper. An additional limitation is that the research was conducted once. For the research to be representative, it needs to be conducted in more and longer time series so that specific changes can be correlated and further examined.

This research can be the basis for future repeated research after the intensification of marketing activities with the application of appropriate variables and appropriate statistical methods. It is possible to monitor individual socially responsible activities of companies and their promotion on the impact on changes in consumer behavior.

6. CONCLUSION

Socially responsible business and socially responsible marketing play an increasingly important role in encouraging changes in consumer behavior. Positive changes are directed towards activities with a reduced negative impact on the environment, and thus also towards improving the community where companies operate, and the population lives.

In the long term, profit is not the only and most important measure of success. However, socially responsible activities in the internal and external dimensions of companies that communicate with the public or that achieve a competitive advantage. Every company has some of its responsible activities, with which it has a positive effect on the environment. Socially responsible business is an essential factor in implementing strategic activities that achieve long-term prosperity, positive influence, and influence the very reputation of the company in all its marketing activities.

The results from socially responsible activities largely depend on the company, its capabilities and the environment in which it operates. Every company, through the influence of social activities, can achieve a positive, neutral or negative effect. The competitive environment imposes a complex and challenging task on companies because consumers are increasingly demanding the choice of products that satisfy their needs, and the criteria are different: from price, quality, packaging, features and other market characteristics of the products with which the providers try to win the consumer's trust. Individual suppliers and their products stand out through socially responsible activities. In this way, consumers can better manage their purchases and become more aware of the importance of socially responsible businesses.

To implement socially responsible businesses, it is necessary to constantly communicate with consumers to understand the message they want to convey. In this sense, marketing communication should be intensified to be educational,

informative and persuasive. It encourages consumers who sometimes or never carry out certain activities to move towards positive changes, pointing out the usefulness of changed behavior for health and the environment in which they live. Every small behavior change ultimately gives a significant result.

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ARTIFICIAL INTELLIGENCE AND BLOCKCHAIN TECHNOLOGY IN MARKETING TRENDS: EXPLORING THE ROLE IN BRAND VALUE CREATION

Mladen PANCIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: mladen.pancic@efos.hr

Drazen ĆUĆIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: drazen.cucic@efos.hr

Dora DUJAK
Divmar d.o.o.

E-mail: dora.dujak@gmail.com

Abstract

Artificial intelligence (AI) and blockchain technology have been two major emergent trends with significant attraction across various fields, with marketing no exception. There is an increased interest in understanding the application of blockchain technologies in digital advertisement and marketing. Nonetheless, the complete transformation into automation and digitalization has somehow remained slow-paced.

The research aims to examine emerging trends pertinent to the application of AI and blockchain technology in marketing and advertising and investigate the impact of the two technologies on brand value creation.

A sequential exploratory research design was conducted to determine the emerging trends pertinent to applying AI and blockchain technology in mar-

keting and advertising and to examine the impact of the two technologies on brand value creation.

The findings demonstrate the tremendous role of AI and blockchain technology in creating brand value. AI and blockchain technology contribute to greater reach and awareness, enhancement of customer lifetime value, increased share of voice and efficient ad spending, greater sales and financial value and increased customer loyalty retention.

The integration of AI and blockchain technology contributes to the creation of brand value and increases the effectiveness and efficiency of marketing.

Keywords: Artificial intelligence, blockchain technology, brand value creation

JEL Classification: O32, M31

1. INTRODUCTION

A paradigm change has occurred in the ever-changing marketing environment due to the growing prevalence of digital technologies. In today's business world, innovative tools and technologies are being leveraged by companies in order to build brand value, improve the whole customer experience, and gain a competitive edge in the market (Chui, 2017). Artificial intelligence (AI) and blockchain technology have emerged as transformative forces that are changing the future of marketing. Among these technological developments, AI and blockchain technology have emerged as some of the most important. According to Oosthuizen et al. (2021), integrating these technologies presents marketers with many opportunities and benefits, including making data-driven decisions, improving campaigns, and establishing customer trust. This study intends to investigate AI and Blockchain Technology's role in current marketing trends, particularly emphasizing how these technologies contribute to brand value development (Oosthuizen et al., 2021).

Artificial intelligence, an umbrella term encompassing machine learning, deep learning, and natural language processing, has shown its potential in various marketing applications (Sharma, Mithas & Kankanhalli, 2014). This potential can be proven via artificial intelligence. Marketers can understand consumer behavior, foresee trends, and modify their plans accordingly thanks to AI-powered systems that can analyze large volumes of data, discover patterns, and generate insights (Huang & Rust, 2021). In addition, artificial intelligence

can automate monotonous jobs, improve customer interactions, and increase marketing operations' effectiveness (Mustak et al., 2021). On the other hand, blockchain technology is a decentralized and distributed digital ledger well-known for its transparency, security, and inalterability (Zohar, 2015). In the marketing context, blockchain has the potential to make the sharing of confidential data easier, safeguard intellectual property, and make financial transactions more auditable and resistant to manipulation (Swan, 2015). According to Yli-Huumo et al.'s research from 2016, implementing blockchain technology in marketing can also assist in reducing instances of ad fraud, guarantee proper attribution, and build trust among various stakeholders.

Several studies have acknowledged the potential of artificial intelligence (AI) and blockchain technology in marketing, highlighting their capacity to revolutionize advertising (Wang et al., 2022), customer relationship management (CRM) (Mariani, Perez-Vega & Wirtz, 2022), and content marketing (Chui, 2017). Specifically, this research has focused on the potential of AI and blockchain technology to revolutionize advertising, CRM, and content marketing. On the other hand, a paucity of research investigates their combined effect on the production of brand value, mainly when seen in developing marketing trends. This study fills this research vacuum by investigating the synergy between AI and blockchain technology and their role in influencing the future of marketing and brand value generation. Specifically, the paper focuses on AI and blockchain technology's role in designing the future of marketing.

According to the study by Adigüzel (2021), blockchain is considered the most prominent technology in IT that can involve multiple parties in a transaction. The increasing use and acceptance of cryptocurrency have led to the market's growth, while commercial banks have opted to use blockchain technology for processing their payments and issuing digital currencies. AI and blockchain technology have altered marketing tactics by excluding intermediaries and developed absolute record sharing (Antoniadis, Kontsas & Spinthiropoulos, 2019). AI and blockchain technological developments have revolutionized the generations by Industry 4.0. Still, a complete transformation into automation and digitalization has somehow remained slow-paced in some areas of industrial processes, which is among the main problems in the industry.

Moreover, due to a lack of acceptance among consumers for security threats and privacy issues, people have been using these technologies on a smaller scale.

Furthermore, companies feel unsafe using digital marketing tactics due to a lack of governmental efforts toward policymaking and law enforcement (Kumar et al., 2022). Therefore, this research aims to analyze the latest trends of artificial intelligence and blockchain technology in marketing to check the impact on brand value creation.

Therefore, this research examines the critical areas of AI and blockchain technology influencing recent marketing trends to enhance customer value-creation. The study covers the aspects of marketing and issues yet addressed and to be addressed by this piece of research. Further, the study involves crypto-currency and transactions leading to easy payments to prevent extra fees, ultimately leading users to make payments securely by blockchain technology integration. Moreover, the creation of digital ads by analyzing consumer behavior and other uses of AI to create value among consumers for a brand. Therefore, the critical areas of marketing and brand value-creation are analyzed. The research background and problem, the following aims and objectives, are derived from achieving this study:

1. To explore the emerging trends of blockchain technology in marketing.
2. To explore the emerging artificial intelligence (AI) trends in marketing/ advertising.
3. To examine the impacts of AI and blockchain technology on brand value creation.

2. LITERATURE REVIEW

2.1. Diffusion Of Innovation Theory

The Diffusion of Innovations theory, developed by Everett Rogers (1962), explains how new ideas, technologies, or practices spread within a social system over time. This theory has been widely applied to study the adoption and diffusion of emerging technologies, including AI and Blockchain, in marketing trends. The theory identifies five factors influencing the adoption of innovations: relative advantage, compatibility, complexity, trialability, and observability (Bharadwaj & Deka, 2021). This literature review will explore the role of AI and Blockchain technology in marketing trends within the Diffusion of Innovations theory context. AI and Blockchain technologies offer several advantages over traditional marketing methods, including cost reduction, increased efficiency,

and improved decision-making (Lampo, 2022). AI algorithms enable marketers to analyze large datasets, identify patterns, and optimize their strategies accordingly (Huang & Rust, 2021). Blockchain ensures secure data sharing and transparent transactions and reduces ad fraud, which can lead to increased trust among stakeholders (Yli-Huumo et al., 2016). These advantages have led to increasing number of organizations adopting AI and Blockchain technologies in their marketing efforts (Polyakov & Kovshun, 2021). Therefore, the diffusion of innovations theory supports AI and blockchain technology in marketing trends and creates brand value.

2.2. Artificial Intelligence In Marketing Trends

In recent years, there has been a substantial increase in attention focused on artificial intelligence (AI)'s role in marketing trends. Numerous studies have highlighted the revolutionary potential of AI in the field of marketing. A strategy framework for the application of artificial intelligence (AI) in marketing was developed by Huang and Rust (2021). The authors emphasized that marketers should focus on harnessing AI to boost consumer interaction, personalization, and decision-making. According to the study's findings, having a solid understanding of consumer behavior and using AI algorithms to deliver individualized experiences is critical. This, in turn, will increase customer loyalty and happiness. Huang and Rust (2021) also identified significant areas where AI might contribute to marketing. These areas include client segmentation, targeting, content development, and performance evaluation. Verma et al. (2021) conducted a comprehensive analysis of the uses of artificial intelligence (AI) in marketing. They uncovered four primary themes: consumer involvement, marketing operations, decision-making, and ethical considerations. According to the study, AI-driven chatbots, recommendation systems, and personalized marketing techniques can increase consumer engagement, while AI-driven automation and data analytics can improve marketing operations.

In addition, Jarek and Mazurek (2019) investigated AI's impact on several aspects of marketing, such as product development, price, promotion, and distribution. The authors stated that artificial intelligence might make it possible for marketers to better understand customers' demands and preferences, leading to more successful product invention and adaption. In addition, Jarek and Mazurek (2019) theorized that AI might facilitate real-time inventory man-

agement and optimize supply chain operations, both of which would simplify distribution procedures. The role of artificial intelligence (AI) in redefining the purchasing function was investigated by Allal-Chérif et al. (2021). The authors highlighted the potential of AI in improving procurement processes and supplier relationships. According to the study's findings, artificial intelligence may be used to examine supplier performance, evaluate risks, and locate chances for collaboration, ultimately improving supply chain efficiency and stimulating innovation. Allal-Chérif et al. (2021) emphasized the significance of considering the ethical repercussions that could result from deploying AI in the purchasing function. These repercussions include the possibility of job displacement and issues regarding data protection.

Vlaic et al. (2021) presented a comprehensive analysis of the expanding role that AI is playing in marketing. They outlined significant application areas and proposed a research agenda for subsequent studies. The writers explored the applications of artificial intelligence in various fields, including customer relationship management, marketing analytics, and marketing via social media. Vlaic et al. (2021) also noted problems and possibilities related to using AI in marketing. They emphasized the necessity for multidisciplinary research and collaboration among academia, industry, and policymakers to maximize AI's benefits while addressing potential hazards.

2.3. Blockchain Technology In Marketing Trends

Researchers are investigating the potential for Blockchain technology to change numerous marketing elements, and the question of the role of Blockchain technology in marketing trends has emerged as a subject of substantial interest. In their analysis of recent research on Blockchain technology, Zheng and Lu (2022) found various uses across various industries, including marketing. The authors emphasized the potential of Blockchain technology to improve transparency, traceability, and confidence in the procedures involved in marketing. They stressed the role that Blockchain might play in reducing ad fraud, assuring correct attribution, and cultivating trust among the many parties. The study also investigated potential developments in Blockchain research in the future, such as how it might be combined with other new technologies, such as the Internet of Things (IoT) and artificial intelligence (AI), to broaden its influence on marketing further. The potential of Blockchain technology in power sys-

tems was investigated by Di Silvestre et al. (2020), and the researchers looked at its implications for marketing in the energy sector. According to the study, Blockchain technology has several potential uses in the energy industry. These applications include energy trading, distributed energy resource management, and supply chain traceability. The authors stressed the capacity of Blockchain to provide transparent transactions, improve security, and streamline operations in the energy industry, ultimately leading to more efficient marketing methods and improved customer trust.

Wustmans et al. (2021) utilized a variety of data sources, such as trends and patents, to analyze the many innovation domains in Blockchain technology. According to their research findings, marketing-related applications of Blockchain technology, such as supply chain management, protection of intellectual property, and digital identity verification, have garnered growing attention over the past few years. The authors highlighted the potential of Blockchain technology to support secure data exchange, preserve intellectual property rights, and enable transparent transactions in marketing. This can lead to greater stakeholder trust, enhancing brand value generation. Mannaro et al. (2017) investigated the potential applications of Blockchain technology in the energy market. More specifically, the authors concentrated on crypto-trading as an innovative strategy for trading energy. Blockchain might make it possible to have decentralized energy markets in which customers could sell energy directly to one another and avoid using existing intermediaries. This new paradigm has repercussions for marketing in the energy industry because it can lead to more customer-centric tactics, allowing customers to make educated decisions and fostering trust in the market.

2.4. Role Of Artificial Intelligence And Blockchain Technology In Brand Value Creation

A growing number of academics are focusing on the potential of artificial intelligence and blockchain technology to revolutionize many facets of branding and marketing as they investigate how these technologies create value for brands. In their study on corporate innovation based on AI and Blockchain technology, Wang et al. (2022) highlighted the synergistic impacts of both technologies in increasing brand value generation. The authors identified significant applications like supply chain optimization, targeted marketing, and data-driv-

en decision-making as having the potential to contribute to improved customer experiences and more substantial brand equity, respectively. Cao (2021) focused on the retail industry and discussed how AI applications, such as chatbots, recommendation engines, and inventory management systems, might support value creation by optimizing customer experiences, streamlining processes, and enabling more efficient targeting. Cao included examples from the retail industry to illustrate his points.

The research conducted by Abdollahi et al. (2023) utilized a multiple case study methodology to investigate Blockchain technology's function in producing value. The authors focused on the technology's ability to improve trust, increase transparency, and safeguard data across various business sectors. The authors stated that these characteristics could contribute to establishing brand value by providing better customer experiences and boosting stakeholders' confidence. Markopoulos et al. (2020) researched the application of artificial intelligence and blockchain technology in human resources, particularly team management. The authors demonstrated that combining these technologies might lead to more effective team management and decision-making, which would eventually impact the production of brand value by encouraging a more creative and productive staff.

3. RESEARCH METHODOLOGY

3.1. Research Design

A research design is the study's structure to attain the study's goals and aims. The focus of this study is to collect information to minimize errors and bias in the research subject. The study by Bloomfield and Fisher (2019) states that research design comprises four elements to gain valuable data: collection, analysis, interpretation, and suggesting output usage. The research designs can be of the following types, review-based, experimental, correctional, semi-experimental, interpretive, and exploratory. However, this study uses exploratory research design (i.e., mixed-method research) to analyze the AI and blockchain marketing tactics influencing brand value. As the study uses primary data collection, the study by Luijken et al. (2022) shows that exploratory research aids in efficient data collection for primary research.

3.2. Research Approaches

The research approach is a road map to reach targeted groups for accessing quantifiable and quality data; research design approaches are of three types qualitative, quantitative, and mixed methods. Qualitative studies rely on individuals' ideas, concepts, and perceptions to gain valid and reliable results (Hayashi, Abib & Hoppen, 2019), whereas quantitative design is based on numeric data collected by survey responses; therefore, numeric data gives accurate results derived from mathematical calculations. A mixed Method is a design approach incorporating qualitative and quantitative data to get more accurate and reliable results to support the study objectives via a sequential exploratory research design. This study uses a mixed method approach as the study results are generated by evaluating people's ideas, knowledge, and perceptions about AI and Blockchain related to marketing and impacts on business value creation. On the other hand, the research data is driven by qualitative responses gathered from interviewing the participants (Turtle, 2020). Qualitative and quantitative data help in identifying the relation and impact of variables. Therefore, the study employed qualitative and quantitative designs to explore the role of AI and blockchain in marketing trends.

3.3. Data Collection Procedure

Data collection can be of two types such as primary and secondary data. Primary researches include direct data collection from the participants of a targeted group. In contrast, secondary data collection targets the published data from peer-reviewed articles, websites, and databases through internet sources. This study collects secondary data from previous studies to qualitatively analyze primary data from survey respondents. The data is in numbers and text, interpreted to provide meaningful insights. The primary data collection method is suggested in the study by Hammer and Wildavsky (2018). It enhances the interaction between the researcher and study participants to help explore the research spectacle. The content analysis assesses the trends in AI and BCT, while surveys follow the close-ended structure to make an adequate data set. The study collected data from previous research published in the last ten years. It focused on using artificial intelligence tools and techniques and blockchain technology to enhance the security of its systems. The data collected from participants included their demographic information, followed by a questionnaire compris-

ing five open-ended questions to be answered by the three MNCs. In contrast, the survey participants responded to 10 close-ended questions designed on a 5-point Likert scale. The study by DeJonckheere and Vaughn (2019) suggests that using open-ended questions allows better interaction to gain valuable data.

The data collected through secondary literature is interpreted based on the concepts used by various researchers and is cited in this study as supporting literature. The numerical data collected from surveys is analyzed through mathematical and statistical calculations to evaluate the impact of AI and blockchain technology marketing strategies on brand value creation. The study by Leech (2021) states that SPSS is an open-source platform for extracting relationships and influences among variables through statistical methods. Therefore, this study also used SPSS (Statistical Package for Social Sciences) to derive the results of primary survey data responses. The results are interpreted based on findings and contrasting literature to provide evidence-based results.

Furthermore, the ethical considerations of the research roots in the element that the research complies with all the ethical standards issued by the ethical committee. Arifin's (2018) study suggests that the study must be free from harmful activities violating environmental and human standards. The research aims to protect the privacy of respondents by publishing the responses anonymously. The participants sign a consent form clarifying the study's objectives, and participants are not allowed to withdraw from the study before publishing the results. Moreover, the study is free from racial and cultural biases to maintain the credibility of the research. The data collected from the participants were kept in a locked folder accessible by the researcher. At the same time, the study only uses the data to check the impact of AI and blockchain technology on brand value creation.

4. RESULTS

4.1. Qualitative Results

4.1.1. Emerging Trends Of AI In Marketing And Advertising

The qualitative outcomes from the research conducted by Dimitrieska, Stankovska, and Efremova (2018) determine that artificial intelligence (AI) shares a long-term role in the contemporary marketing aspect of various busi-

nesses. With the help of AI, businesses can predict the purchasing behaviors of their target customers, which helps in reshaping their advertising campaigns. The findings suggested that the core powers of AI tools lie among two chief elements, including 1) machine learning and 2) big data. Big data analytics help businesses gather and segment a large amount of customer behavior data, whereas machine learning helps marketers learn about the purchasing behaviors and trends of potential customers regarding specific products by analyzing the big data. The outcomes also implicated that business marketers and advertisers will witness a significant impact of AI in the coming few years with new AI aspects, including smarter advertisements, image, voice, face, and language recognition, relying on bots, and systematic learning.

Qualitative findings obtained from the research conducted by Peyravi, Nekrošienė and Lobanova (2020) critically explain the role of artificial intelligence in the marketing and advertisement industry. It has been reinforced by the literature that the Internet and digital marketing revolutionized the traditional norms of marketing and advertising. Notwithstanding, artificial intelligence technology has now revived digital marketing practices with the introduction of customization, automated advertisement, neuromarketing, voice and facial recognition, and optimization techniques. The study's implications have suggested artificial intelligence as a remarkable phenomenon in business advertisement and marketing due to its emerging and unending characteristics. The findings further stated that AI has a preexisting grabbing nature in the advertisement industry. However, the future implications of the technology are undefined because, with each feature of AI, marketing and advertising is getting unending benefits.

Verma et al. (2021) also explored artificial intelligence's role in business marketing and advertising strategies. It was believed by Verma et al. (2021) that digital technologies, including the Internet of Things, big data analytics, BCT, and AI, have revolutionized the concepts of digital marketing and advertisement. However, AI's role is considered the most significant of all. The findings indicated that AI is emerging as a technological giant that encompasses minor to major marketing industries that revolve around diverse sectors including, but not limited to, agriculture, health and pharmaceuticals, logistics, manufacturing, and logistics. The outcomes also entail those different businesses now looking to adopt and implement marketing solutions that are typically the best fit for AI techniques.

4.1.2. Emerging Trends Of Blockchain In Marketing And Advertising

The study by Stallone, Wetzels and Klaas (2021) particularly highlighted the emerging trends of BCT in the marketing sector of several businesses. The findings claimed that BCT has dramatically impacted the relationship between companies and their customers. The impact was investigated by mapping, selecting, and then analyzing the existing companies already using blockchain technology in their marketing procedures. It has been explained that the contemporary business world observed an expansion in advertising with the outgrowing of e-commerce and related fields. It emphasized strengthening the developmental tools that can further enhance the emerging applications of BCT in marketing.

The results obtained from the study by Rejeb, Keogh and Treiblmaier (2020) demonstrate that the rapid emergence of technological innovations in the e-commerce platforms, such as blockchain technology, has increasingly influenced business-to-customer commerce and business marketing. With the help of BCT, the marketing tactics of businesses are now more prone to achieve extensive reach and set customized targeting goals that eventually enhance the trusting bond between the business and its customers. The literature indicated six key emerging features of BCT on marketing aspects of businesses that include 1) fostering disintermediation, 2) supporting the fight against click fraud, 3) strengthening trust, loyalty, and transparency, 4) empowering greater privacy protocols, 5) fostering security, and 6) establishing loyalty programs. By using these identified propositions, researchers in future work can achieve immense support regarding the blockchain's influence on marketing.

The findings of the literature by Harvey, Moorman and Toledo (2018) explored the definitions of blockchain technology and its impact on the marketing tactics of businesses. The results claimed that blockchain technology is an innovative database in which hackers cannot manipulate and damage the data. Using blockchain technology, the databases are divided into segments called blocks or sheets, and each of these blocks holds a unique signature that involves all the relevant information in it. Any change in the data results in a complete change of the signature that helps prevent the actual data. The results implicated its significance in the marketing field and broader scope for the fundamental future of marketing practices. It is also claimed by the result outcomes that businesses that are adopting blockchain in their operations on time will get a huge benefit.

On the other hand, the other businesses will face a critical cost to pay for leaving the BCT behind their business marketing protocols.

4.2. Quantitative Results (Survey)

4.2.1. Descriptive Statistics

The descriptive statistics are conducted to determine the extent to which the marketing managers in the survey affirm the given statements demonstrating their agreement with the contribution of AI and blockchain technology. The results in the before mentioned table 1 show that the mean scores of all the items for each variable are higher than the standard deviation values showing that the responses were consistent, without any variation and closer to the mean. As the mean values are found to be greater than 4, this implies that the data is skewed at the right side of the Likert scale and managers have marked higher points (4; agree and 5; strongly agree), demonstrating high agreement with the statements in the questionnaire (Appendix). Thus, all the managers in the survey agreed with the effect of AI and blockchain technology on their marketing and advertising, demonstrating that with AI and blockchain technology, they are better able to execute their marketing campaigns with actionable customer insights, offer personalized offers, better target and engage with customers, use ad spend on legitimate users, optimize advertising to use most effective channels, increase awareness etc. In the context of brand value creation, the managers agreed that they could create the desired value in the minds of their customers. They demonstrated that their brand has grown on various financial, customer and market-based value metrics such as market share, Net Promoter Score, Customer lifetime value, the share of voice, price premium, local stores sales and customer loyalty.

Table 1. Descriptive Statistics

Blockchain Technology		Min	Max	Mean	SD
1	BCT1	1.00	5.00	4.9863	.67162
2	BCT2	1.00	5.00	4.9407	1.0971
3	BCT3	2.00	5.00	4.5670	.78911
4	BCT4	1.00	5.00	4.8898	1.89614
5	BCT5	2.00	5.00	4.9831	1.09613
6	BCT6	2.00	5.00	4.5373	.78812
Artificial Intelligence					
7	AI1	1.00	5.00	5.5763	1.89616
8	AI2	2.00	5.00	4.7712	1.90861
9	AI3	1.00	5.00	4.7635	.87912
10	AI4	1.00	5.00	4.9434	1.99781
11	AI5	2.00	5.00	4.5981	.99762
12	AI6	1.00	5.00	4.7561	1.89652
Brand Value Creation					
13	BVC1	1.00	5.00	4.5681	.87293
14	BVC2	1.00	5.00	4.4891	.82927
15	BVC3	2.00	5.00	4.6581	.78612
16	BVC4	1.00	5.00	4.9617	1.89739
17	BVC5	2.00	5.00	4.5571	.90862
18	BVC6	1.00	5.00	4.8951	1.78913
19	BVC7	2.00	5.00	4.7565	1.96728

Source: authors

4.2.2. Correlation Analysis

A correlation test was conducted to analyze the relationship between the variables in Table 2. The correlation test results showed that a significant correlation exists between the variables as the p-value is greater than 0.05 showing less than 5 percent error probability and over 95 percent significance at -1 < r > 1. The positive value of r demonstrates that the direction of the relationship is positive, whereby the increase in the value of one variable contributes to the increment in the value of the other. Thus, this shows that integrating AI and BCT in marketing and advertising can contribute to increasing brand value across various financial, customer and market-based metrics.

Table 2. Correlation Analysis

Correlations		AI	Blockchain technology	Brand value creation
AI	Pearson Correlation	1	.549*	.675**
	Sig. (2-tailed)		.034	.000
	N	500	500	500
Blockchain technology	Pearson Correlation	.549*	1	.397**
	Sig. (2-tailed)	.034		.001
	N	150	150	150
Brand value creation	Pearson Correlation	.675**	.397**	1
	Sig. (2-tailed)	.000	.001	
	N	500	500	500
	N	500	500	500
**. Correlation is significant at the 0.01 level (2-tailed)				

Source: authors

4.2.3. Regression Analysis

A regression test was conducted to measure the strength of the relationship between the integration of AI and BCT and brand value creation. The results are presented in the following table 3. The coefficient of determination, R-square, is used for predicting the extent of the relationship between the variables that predicts how much variation the model can explain in the criterion variable. In the present case, the value of R square for the relationship between predictors and brand value creation is 0.80. This implies that integrating AI and blockchain technology can explain an 80 percent variation in brand value creation. Thus, a significant and robust relationship exists between integrating AI and blockchain technology in marketing and advertising and creating brand value. Assessing the mode fit, it is observed that the p-values are less than 0.05, which shows that there is a significant relationship between the variables. The non-standard coefficient, beta value, indicates the value of the regression equation to predict the change in the criterion variable from the predictor variable, which is 0.155 and 0.134. The constant represents the regression intercept at no interaction with the independent variables, which is 2.544. The favorable price coefficient indicates a positive relationship: the more AI and blockchain

technology capabilities are incorporated into marketing, the more significant the impact on brand value creation. The regression equation for the relationship is as follows:

Table 3. Regression Analysis

Coefficients							
Model		**Unstandardized Coefficients**		**Standardized Coefficients**		**t**	**Sig.**
		B	Std. Error	Beta			
1	(Constant)	2.544	.405			8.754	.000
	AI	.155	.089	.146		1.745	.033
	Blockchain technology	.134	.111	.111		1.567	.000
a. Dependent Variable: Brand value creation							
Model	**R**		**R Square**		**Adjusted R Square**		**Std. The error in the Estimate**
1	.146[a]		.021		.014		.60109
a. Predictors: (Constant), AI, BCT							

Source: authors

5. DISCUSSION

The research findings demonstrate that AI and blockchain are the new era of marketing and contribute to the company's effectiveness and efficiency of marketing and advertising efforts. It was found from the results that companies in marketing and advertising are incorporating AI to obtain valuable insights about customers. This enables companies to leverage data to tailor personalized marketing messages that appeal to individual customers. It is asserted that in the present customer-centric market, the complexity of decision-making has increased, which requires an understanding of the needs and preferences of the customers and tailoring the marketing message and products to meet these needs and preferences. In this regard, the incorporation of AI optimizes customer communications. It delivers timely and customized messages to ensure maximum efficiency and that the messages appeal to the customers' preferences (Conick, 2017). AI works intelligently by integrating businesses and marketers to develop, integrate, organize, and use marketing knowledge to promote brands globally (Davenport & Ronanki, 2018). This enhanced understanding of consumer preferences and behavior contributes to a rise in sales (financial value) (Syam & Sharma, 2018). It is also found that this ability to leverage the

vast amount of consumer insights over a customer's lifetime enables the brands to make metrics-driven decisions and adjust strategies to help customers convert faster and buy more. This ultimately increases loyalty and converts customers into promoters (Libai et al., 2020). This demonstrates the contribution of AI to the customer lifetime value, a significant metric of brand value creation (Verhoef & Lemon, 2013).

It is also found that companies can automate their interactions with customers with a chatbot. The literature supports this finding as it is asserted that AI technology, with its natural language processing, facilitates customer communication in an effective and time-efficient manner (West, Clifford & Atkinson, 2018). For instance, it is suggested that an AI-powered chatbot developed by Bookings.com offers 24/7 customer service support in 43 languages and offers immediate responses to travel-related queries by customers (Cross, Davenport & Gray, 2019). With their sophisticated language processing capabilities, these chatbots facilitate customer communication and provide customized recommendations that enable the platform to increase its user base and revenue (financial value) (Cross, Davenport & Gray, 2019). Thus, this improves customer communications, delivering improved customer services and experience (West, Clifford & Atkinson, 2018). Thus, the enhancement of customer services and customer experience directs attention toward the creation of brand value from the perspectives of the customers. In this context, the notion of brand love is also found to be relevant that helps in understanding the relationship between consumers and brands (Huber, Meyer & Schmid, 2015). This is the level at which a satisfied consumer becomes passionately and emotionally attached to a particular brand through an interactive agent. These interactive agents help brands communicate with consumers without requiring staff to perform the task (Xu et al., 2017). Virtual agents provide customers with data, coordination, and purchasing decisions. Thus, brand love entails attitudes, trust, self-expression, the highest customer satisfaction and emotional attachment generated by virtual agents (AI) (Sarkar, Sarkar & Phau, 2016).

The results also demonstrated that the integration of AI in advertising enables the brand to determine the relative effectiveness of all the marketing channels. Thus, marketers can determine which channel works best to optimize and adjust their ad spending and invest in the most effective channels. The literature well supports this as it is found that AI allows the brand to target the proper channels making advertising and marketing cost-efficient. Machine learning

improves response to changing customer preferences as customers react to different messages across channels. Emotional messages appeal to some customers, while some customers are intrigued by humor etc. Content analysis allows the brands to optimize the value and effectiveness of the messages (Chatterjee et al., 2020; Basri, 2020). Emotional AI algorithms can track customer likes and dislikes in real time (Verma et al., 2021). Thus, AI facilitates tracking the messages and channels that the customers respond to and creating a more comprehensive user profile (Basri, 2020). Using the most effective channels enables the brand to increase its share of voice as it can use all the channels that would better reach the customers and garner more significant traffic (Sterene, 2010). This was demonstrated by the results as well.

All in all, the use of customer data and predictions from AI enhances both customer experience and loyalty. In the short term, AI will create superior brand experiences and value, supporting product personalization by providing relevant promotions and marketing messages, dynamic pricing and quality service to customers resulting in positive sentiments. Similarly, long term, it improves customer relationship management and sustains and enhances brand and customer value (Kumar et al., 2019). Thus, integrating AI in marketing and advertising creates brand equity in global markets by implementing predictive analytics in companies that can facilitate interaction, recommendations, and real-time optimization (Ma & Sun, 2020). Thus, brand value creation is improved with the integration of AI in marketing.

Like AI, blockchain integration has enhanced overall marketing effectiveness and brand value creation. From the results of the study, it was found that blockchain is a relatively new and emerging phenomenon in marketing. It was also found that integrating blockchain enhances information transparency, making consumers aware of whom they share their data. In this context, it is posited that as blockchain technology is built upon peer-to-peer communication, this changes the market structure by facilitating the elimination of intermediaries. In other words, it processes and filters data streams, removing any intermediary that incurs additional costs. Thus, the creation of immutable shared data sets can facilitate the improvident of data quality and enhancement of accessibility to data (Rejeb, Keogh & Treiblmaier, 2020). Thus, this will transform the relationship with consumers by improving data and information transparency and ultimately improving data security. Ultimately, this enhances customer loyalty, which adds value to the brand (Rejeb, Keogh & Treiblmaier, 2020; Ghose,

2018). These findings show how marketing and adverting intelligence are improved with the use of blockchain, ultimately leading to the creation of brand value and enhanced customer loyalty.

The study's results also demonstrated that blockchain enhances customer targeting by enabling marketers to track every interaction with the customers and identify the customers who might be interested in the brand's offerings. In line with this finding, it is asserted that blockchain technology facilitates scaling the marketing campaign, improving the ability to target customers, and improving the responsiveness of their services. The interactive capabilities of blockchain enable brands to efficiently communicate the marketing message, bypass intermediaries and reduce the marketing cost (Jain et al., 2021). Furthermore, the results also found that blockchain facilitates accurate data collection. This is supported by the findings of Deighton and Kornfeld (2008), that suggested that brands can encourage customer disclosure and information sharing via loyalty rewards, cryptocurrency and cashback incentives, etc. This implies that it can potentially enhance the brand's direct relationship with customers. Thus, customers can directly reach out to the brands. This shows that using blockchain technology enhances customer engagement, enabling the brands to enhance customer reach and brand awareness, two essential components of brand value (Huang & Sarigöllü, 2014). This demonstrates the role of blockchain technology in the context of brand value creation.

It is worth noting that online advertising and marketing are characterized by various frauds and deceptive tactics that negatively affect the advertising expenditure of the brand (Hongwei & Peiji, 2011). With online sponsored searches dominating marketing campaigns in the digital environment, click fraud significantly clouds the authenticity and reliability of digital marketing campaigns (Jain et al., 2010). In this regard, it was found from the results that the integration of blockchain in marketing enables the marketer to prevent the click-fraud and ensure that advertising and marketing expenditure is being spent on legitimate customers. Thus, by creating a more trustworthy digital marketing environment for consumers and brands, blockchain technology can prevent the threat of the potentially devastating effects of click fraud. Blockchain-based platforms can enable brands and marketers to promote their brands in an open and collaborative environment (Chartier-Rug and Zweifel, 2017). Thus, this enables the brand to ensure the optimal spending of its marketing budget, contributing to its financial value.

6. CONCLUSION

The article demonstrated the role of the integration of AI and blockchain in the domain of marketing and advertising and, ultimately, its contribution to the creation of brand value. It can be well-established from the findings of the study that both AI and blockchain technology have tremendous potential applications for transforming the marketing and advertising of the brand. The two technologies' data mining and extraction capabilities can enable the brand to leverage actionable consumer insights, thereby enhancing the marketing appeal, targeting capabilities, message tailoring, reach and overall awareness. Furthermore, blockchain integration is found to be valuable for collecting customer data, enhancing information transparency and privacy and making ad spending more efficient. This way, the brand can enhance the overall customer experience and service, contributing to customer loyalty and retention and more fabulous sales. This adds to the brand's financial, market and customer-based values. Despite these findings, the study has some limitations. It is important to note that although the study has been able to highlight the potential application of AI and blockchain on marketing and brand value creation, the study has not been able to fully explore the intricacies and subtleties of the two techniques in the context of brand value that shall be investigated in future research.

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WELCHE EFFEKTE HABEN REALE UND VIRTUELLE INFLUENCER AUF DIE EINSTELLUNG ZUR MARKE?

Ulrich FÖHL, Ph.D.
Pforzheim University, Business School

E-Mail: ulrich.foehl@hs-pforzheim.de

Nina-Marie HEIL
Pforzheim University, Business School

E-Mail: ninamarie.heil@gmail.com

Abstract

Neben realen Personen werden seit einigen Jahren im Influencer Marketing auch virtuelle Influencer eingesetzt. Dabei handelt es sich um Computer-generierte Figuren, die auf Social-Media-Kanälen Produkte bewerben. Während die Wirkungsweise von menschlichen Influencern bereits gut untersucht ist, existiert noch wenig insbesondere quantitativ-experimentelle Forschung zu virtuellen Influencern. Die vorliegende Arbeit vergleicht im Rahmen einer experimentellen Online-Studie die Effekte von virtuellen mit realen Influencern auf gängige Erfolgsindikatoren wie die Einstellung gegenüber einer beworbenen Marke. Zudem wird untersucht, inwieweit zwei potentielle Mediatoren diese Beziehung zwischen der Art des Influencers und der Einstellung beeinflussen. Neben der Glaubwürdigkeit des Influencers wird dabei die wahrgenommene Kongruenz zwischen dem Selbstbild der Rezipienten und dem Image der Influencer betrachtet. Die Ergebnisse zeigen eine generelle Überlegenheit menschlicher gegenüber virtuellen Influencern bei der Einstellung zur Marke sowie bezüglich der Glaubwürdigkeit. Darüber hinaus konnte die Glaubwürdigkeit des Influencers als Mediator bestätigt werden. Lediglich für die Kongruenz blieben entsprechende Effekte aus. Beim Einsatz von virtuellen Influencern im Marketing sollte folglich insbesondere der Aspekt der Glaubwürdigkeit berücksichtigt werden. Künftige Studien sollten klären, was bei virtuellen Influencern Glaubwürdigkeit erzeugt und welche weiteren Faktoren die Akzeptanz der künstlichen Figuren beeinflussen.

1. EINLEITUNG

Internet, neue Technologien und die zunehmende Verbreitung von Social Media haben zu deutlichen Veränderungen des Mediennutzungsverhaltens geführt. So zeigt sich gerade bei jüngeren Zielgruppen eine Abwendung von klassischen Medien wie TV und Hörfunk hin zu Onlinemedien und sozialen Netzwerken (NDR, 2019). Durch diese umfassenden Veränderungen haben sich neue Werbeformen wie das Influencer Marketing etabliert. Dieses ist inzwischen fester Bestandteil des Marketings vieler Unternehmen und zeigt sich auch in einer deutlichen Budgetsteigerung in den letzten Jahren (Kim, 2022; Linqia, 2019).

Bei Influencern handelt es sich um Personen, die ein umfangreicheres soziales Netz von Personen aufgebaut haben und als „trusted tastemaker in one or several niches" (De Veirman et al., 2017) gesehen werden können. Zu den Wirkmechanismen und Erfolgsfaktoren des Marketings mit unterschiedlichen Arten von Influencern liegt bereits umfassend Forschung vor (siehe Überblick bei Fowler & Thomas, 2023). Wie bereits bei Forschung zu Celebrities konnte gezeigt werden, dass die Glaubwürdigkeit von Influencern einen wichtigen Prädiktor für Erfolgsgrößen wie Einstellung oder Kaufabsicht gegenüber einem von Influencern beworbenen Produkt darstellt (Belanche et al., 2021, Schouten et al., 2020). Auch die wahrgenommene Ähnlichkeit zwischen Influencer und Rezipient trägt zur Wirkung des Influencer Marketings bei (Naderer et al., 2021; Schouten et al., 2020).

Durch technologische Fortschritte insbesondere in den Bereichen IT und der künstlichen Intelligenz fand in den letzten Jahren eine neue Form von Influencern zunehmend Verbreitung. Bei diesen sogenannten virtuellen Influencern handelt es sich um „digitally created artificial human(s)" (Thomas & Fowler, 2021, S. 12) mit einer großen Zahl an Social-Media-Followern (Moustakas et al., 2020). Sie gehören nach Burden und Savin-Badin (2019) zur Kategorie von „virtual humans", zeigen menschliches Verhalten und können weitere menschliche Merkmale wie eine Persönlichkeit aufweisen (Franke et al., 2023).

Zur Wirkungsweise von virtuellen Influencern im Marketing liegen bislang noch wenige Befunde vor (siehe Überblick bei Conti et al., 2022; Batista da Silva Oliveira & Chimenti, 2021). Studien mit netnographischen, qualitativen und vereinzelt quantitativen empirischen Ansätzen haben erste Erkenntnisse und Hypothesen zu Wirkmechanismen geliefert. So konnten unterschiedliche Motive identifiziert werden, die bei der Interaktion mit virtuellen Influencern relevant sein könnten (Lou et al., 2022). Demnach spielen im Kontakt mit virtuellen Influencern unter anderem die Bedürfnisse nach Information, Ästhetik, Unterhaltung und sozialer Interaktion eine Rolle. Insbesondere der Vergleich zwischen menschlichen und virtuellen Influencern ist bislang jedoch weitestgehend unerforscht. Franke et al. (2023) konnten quantitativ-experimentell zeigen, dass menschliche Influencer positiver bewertet werden als virtuelle, wobei die virtuellen als neuartiger wahrgenommen wurden. In einer Analyse der Reaktionen auf menschliche beziehungsweise virtuelle Influencer zeigte sich, dass menschliche Influencer mehr positive Reaktionen auf ihre Beiträge erhielten als virtuelle, menschenähnliche Influencer (Arsenyan & Mirowska, 2021).

Daran anknüpfend stellt sich die Frage, wodurch Unterschiede in der Bewertung zwischen menschlichen und virtuellen Influencern beeinflusst werden. Dazu wurden im Rahmen der vorliegenden Studie die beiden potentiellen Mediatoren Glaubwürdigkeit und Kongruenz zwischen Rezipienten und Influencern untersucht, für die sich in Studien zu menschlichen Influencern immer wieder eine zentrale Rolle nachweisen ließ. Ein besseres Verständnis von Erfolg und Wirkungsweise virtueller Influencer trägt dazu bei, Handlungsempfehlungen für die Influencer-Strategie von Unternehmen abzuleiten, die sich zunehmend auch mit diesen neueren Formen von Influencern befassen.

2. THEORETISCHER HINTERGRUND

2.1 Influencer-Erfolg

Um den Erfolg von Marketingmaßnahmen mit Influencern zu messen, werden in der Regel Einstellungen und verhaltensnahe Größen gemessen, die auch bei Studien zur Wirkung von Celebrities und anderen Formen von Werbung genutzt werden (z. B. Graham & Wilder, 2020; Lee et al., 2017). Psychologische Modelle (z. B. Theory of Planned Behavior, Ajzen, 1991) gehen davon aus, dass die Einstellung, also die positive oder negative Bewertung eines bestimm-

ten Einstellungsobjekts (z. B. eine Celebrity oder ein Werbereiz), zunächst die Absicht beeinflusst, ein bestimmtes Verhalten zu zeigen (z. B. ein Produkt zu kaufen). Die Absicht stellt wiederum einen Prädiktor für konkretes Verhalten dar (den Kauf oder die Weiterempfehlung eines Produkts).

Bei der Forschung zu Celebrities und Influencern kann nach verschiedenen Formen der Einstellung differenziert werden. So lässt sich die Einstellung gegenüber einer Celebrity nach Bergkvist et al. (2016: 172) definieren als „someone's positive or negative evaluation (like or dislike) of the celebrity in question". Diese Definition lässt sich auf den Influencer-Kontext übertragen. Unter Einstellung gegenüber einem Influencer kann somit die positive oder negative Bewertung gegenüber dem jeweiligen Influencer verstanden werden. Franke et al. (2023) sowie De Veirman et al. (2017) nutzen ähnliche Konzeptualisierungen von Einstellungen als Erfolgsgröße im Kontext von Influencer Marketing. Daneben wird unter der Einstellung zur Marke die Beurteilung der Marke hinsichtlich produktbezogener sowie produktunabhängiger Eigenschaften verstanden (vgl. Ansary & Nik Hashim, 2018) und stellt eine weitere Erfolgsgröße im Influencer Marketing dar. Einstellungen können sich schließlich positiv auf die Kaufabsicht auswirken (vgl. z.B. Chetioui et al., 2020; Trivedi & Sama, 2020).

2.2 Rolle der Glaubwürdigkeit

Neben diesen allgemeinen Erfolgsgrößen des Influencer Marketings wurden für menschliche Influencer verschiedene Wirkfaktoren herausgearbeitet, die Einfluss auf Einstellungen oder Kaufabsicht ausüben. So spielt das bereits im Celebrity Marketing gut untersuchte Konzept der Glaubwürdigkeit des Kommunikators (z. B. Moraes et al., 2019) auch im Influencer Marketing eine wichtige Rolle.

Ein Konzept der Glaubwürdigkeit, auf das in Studien zum Influencer Marketing immer wieder Bezug genommen wird, stammt von Ohanian (1990), der auch eine Skala zur Messung des Konstrukts (Source Credibility) entwickelte und insbesondere auf Arbeiten von Hovland et al. (1953) aufbaute. Ohanian (1990) betrachtet Glaubwürdigkeit als Konzept, das positive Eigenschaften einer Quelle beschreibt, die die Akzeptanz einer Botschaft beim Empfänger beeinflussen. Sein Konzept geht davon aus, dass sich Glaubwürdigkeit aus drei Dimensionen zusammensetzt, der Vertrauenswürdigkeit (Trustworthiness),

Expertise und Attraktivität. Vertrauenswürdigkeit bezieht sich darauf, zu welchem Grad ein Zuhörer einer gesendeten Botschaft Glauben schenkt. Expertise beschreibt das Ausmaß an Kompetenz und Erfahrung der Kommunikationsquelle. Die dritte Dimension, Attraktivität, bezieht sich in erster Linie auf die physische Attraktivität der Quelle.

Das Konzept der Glaubwürdigkeit sowie ihre Teildimensionen wurden wiederholt im Influencer Marketing untersucht. So stellten Martensen et al. (2018) im Rahmen qualitativer Untersuchungen fest, dass eine hohe Glaubwürdigkeit den Einfluss von Influencern grundsätzlich verstärkt. Auch die Arbeiten von Sokolova und Kefi (2020) sowie Pick (2020) bestätigen den Einfluss der Glaubwürdigkeit eines Influencers auf die Kaufabsicht des Konsumenten. Belanche et al. (2021) konnten einen Einfluss der Glaubwürdigkeit auf die Einstellung gegenüber Influencern und die Absicht, ihnen zu folgen, nachweisen. In einer Studie von Dhun und Dangi (2023) zeigte sich ein Einfluss der Expertise auf die Einstellung gegenüber der Marke. Schouten et al. (2020) verglichen Influencer und Celebrities hinsichtlich ihrer Wirkung auf Einstellungen und Kaufabsicht. Dabei erwies sich im Kontext von Beauty-Produkten Vertrauenswürdigkeit als Mediator der Beziehung zwischen Kommunikatortyp (Influencer vs. Celebrity) und den Erfolgsgrößen Einstellung gegenüber dem beworbenen Produkt sowie Kaufabsicht.

Inwieweit Glaubwürdigkeit bei virtuellen Influencern eine Rolle spielt, ist bislang weitestgehend ungeklärt. Im Rahmen einer qualitativen Expertenstudie wurde Skepsis geäußert, ob virtuelle Influencer Glaubwürdigkeit und Vertrauen vermitteln können, da Transparenz besteht, dass sie Produkte, die sie bewerben, nicht selbst testen können (Moustakas et al., 2020). De Brito Silva et al. (2022) gehen davon aus, dass Glaubwürdigkeit auch bei Influencern eine Rolle spielen könnte. Glaubwürdigkeit virtueller Charaktere entstehe dabei insbesondere durch eine hohe Übereinstimmung zwischen den Posts der Influencer und ihrer persönlichen Story, ihrer Persönlichkeit sowie ihrem dargestellten Lebensstil. So zeigte sich in ihrer Studie, dass Posts virtueller Charaktere mit einer besseren Passung dieser Bereiche zu mehr Engagement und Reaktionen der Nutzer führten.

Als zweiter Faktor, der als möglicher Mechanismus bei der Wirkung von virtuellen Influencern betrachtet werden soll, dient die Kongruenz zwischen dem idealen Selbst der Rezipienten und dem Image des jeweiligen Influencers.

Das Selbstbild wurde bereits intensiv im Kontext der Konsumentenpsychologie untersucht und stellt einen wichtigen Prädiktor des Verhaltens von Konsumenten dar (z. B. Onkvisit & Shaw, 1987; Sirgy, 1982). Mit Selbstbild ist die Gesamtheit aller Gedanken und Gefühle gemeint, die eine Person bezogen auf sich selbst besitzt (Onkvisit & Shaw, 1987), wobei oft eine Differenzierung zwischen einem idealen, gewünschten und einem realen, tatsächlichen Selbstbild vorgenommen wird (Sirgy, 1982). Die Self-Congruity-Theorie oder Image-Congruency-Theorie geht davon aus, dass eine Übereinstimmung zwischen Selbstbild von Konsumenten mit einem Produkt oder einer Marke die Kaufentscheidung positiv beeinflussen kann (Onkvisit & Shaw, 1987).

Choi und Rifon (2012) haben die Kongruenz zwischen Konsument und Kommunikator im Kontext des Celebrity Marketings untersucht und fanden heraus, dass eine hohe Übereinstimmung zwischen Merkmalen des Konsumenten und Persönlichkeitseigenschaften der Celebrity zu einer positiven Wirkung auf die Kaufintention führte. Eine Auswirkung auf die Einstellung zur Marke konnte hingegen nicht nachgewiesen werden. Das Konzept der wahrgenommenen Ähnlichkeit zwischen Konsumenten und Celebrities oder Influencern wurde zwischenzeitlich mehrfach untersucht, wobei die Befunde unterschiedlich ausfielen. So konnten Albert et al. (2017) nur schwache Effekte der Kongruenz zwischen Celebrities und Konsumenten auf die Verhaltensabsicht nachweisen. Xu und Pratt (2018) hingegen konnten die Ergebnisse von Choi und Rifon (2012) bestätigen. Shan et al. (2020) fanden in ihrer Studie zur Influencerwirkung zudem einen Einfluss der Kongruenz auf die Einstellung gegenüber der Marke. Einen positiven Effekt der Kongruenz auf die Einstellung gegenüber einem Influencer konnte von Chetioui et al. (2020) nachgewiesen werden. Schouten et al. (2020) untersuchten in ihrer Studie zum Vergleich der Wirkung von Celebrities und Influencern ebenfalls die Rolle der Ähnlichkeit zwischen Rezipient und Kommunikator. Bei einer der untersuchten Produktkategorien konnte die wahrgenommene Ähnlichkeit als Mediator der Beziehung zwischen Kommunikatortyp (Celebrity vs. Influencer) und den Größen Kaufabsicht sowie Einstellung gegenüber dem Produkt identifiziert werden. Für eine andere

Produktkategorie zeigte sich eine Mediatorwirkung bezüglich der Beziehung zwischen Kommunikatortyp und der Einstellung gegenüber dem präsentierten Werbereiz, nicht aber bezüglich der Kaufabsicht oder der Einstellung gegenüber dem Produkt.

Insgesamt konnte somit in Studien mit menschlichen Celebrities oder Influencern immer wieder gezeigt werden, dass die wahrgenommene Übereinstimmung des idealen oder realen Selbstbildes von Konsumenten mit Eigenschaften des jeweiligen Kommunikators einen Einfluss auf gängige Erfolgsmessgrößen wie Kaufabsicht oder Einstellungen ausüben kann, wenngleich die Befunde nicht einheitlich sind und teilweise in Abhängigkeit von Produktkategorien, Messmethoden und untersuchten Erfolgsgrößen variieren. Im Kontext von virtuellen Influencern liegen bislang nur vereinzelt Befunde zur Bedeutung der Kongruenz vor. Stein et al. (2022) verglichen menschliche und virtuelle Influencer hinsichtlich der sogenannten parasozialen Interaktion (PSI), welche die einseitigen Reaktionen von Rezipienten gegenüber Charakteren in den Medien beschreibt. Die Autoren konnten wahrgenommene Ähnlichkeit als Mediator der Beziehung zwischen der Art des Influencers (menschlich vs. virtuell) und dem Ausmaß an parasozialer Interaktion identifizieren. So wurde die Ähnlichkeit von virtuellen Influencern geringer eingestuft als die von menschlichen. Dieses höhere Niveau an wahrgenommener Ähnlichkeit bei menschlichen Influencern vergrößerte auch das Ausmaß an parasozialer Interaktion im Vergleich zu virtuellen Influencern. Auch in einer Studie von Lou et al. (2023) wird die wahrgenommene Ähnlichkeit als Faktor diskutiert, der mitbeeinflusst, in welchem Ausmaß mit virtuellen Influencern interagiert wird. In ihrer qualitativen Studie ergaben sich Hinweise, dass bei geringer wahrgenommener Ähnlichkeit weniger mit virtuellen Influencern interagiert wurde.

3. HYPOTHESEN

Bei menschlichen Influencern liegt bereits umfangreiche Forschung zu Wirkmechanismen vor, wenngleich zentrale Konstrukte wie Glaubwürdigkeit oder Kongruenz beziehungsweise Ähnlichkeit nicht in allen Studien zu gleichartigen Ergebnissen kamen. Im Rahmen dieser Arbeit werden diese Annahmen zu Einflussfaktoren aus dem Bereich menschlicher Influencer und Celebrities auf virtuelle Influencer übertragen. Zudem fließen erste Erkenntnisse aus Forschung zu virtuellen Influencern in die Hypothesenbildung ein.

Es werden folgende Hypothesen postuliert:

H1) Menschliche und virtuelle Influencer unterscheiden sich hinsichtlich

a) der Einstellung gegenüber dem Influencer.

b) der Einstellung gegenüber der Marke.

Es wird jeweils angenommen, dass menschliche Influencer positiver bewertet werden als virtuelle.

Eine Überlegenheit von menschlichen gegenüber virtuellen Influencern konnte bereits in ersten Studien gezeigt werden, obwohl unterschiedliche Erfolgsgrößen untersucht wurden. Während Franke et al. (2023) eine positivere Bewertung der menschlichen Influencer fanden, stellten Arsenyan und Mirowska (2021) mehr positive Reaktionen auf menschliche gegenüber virtuellen Influencern fest.

Im Marketing mit Influencern oder Celebrities wird generell angenommen, dass die Person des Kommunikators letztlich eine Wirkung auf andere Erfolgsgrößen wie die Einstellung gegenüber der Marke oder dem Produkt sowie die Kaufabsicht ausübt (Filieri et al., 2023; Schouten et al., 2020). Deshalb wird erwartet, dass sich Unterschiede zwischen den beiden Influencerarten bei der Einstellung gegenüber der Marke in ähnlicher Weise niederschlagen wie bei der Einstellung gegenüber dem Influencer.

H2) Menschliche Influencer werden als glaubwürdiger eingestuft als virtuelle.

Zum Vergleich der Glaubwürdigkeit von menschlichen und virtuellen Influencern liegen bislang kaum Befunde vor. Moustakas et al. (2020) ziehen im Rahmen ihrer qualitativen Expertenstudie in Zweifel, dass virtuelle Influencer glaubwürdig auftreten können, da sie im Gegensatz zu menschlichen Influencern Produkte, die sie bewerben, nicht selbst ausprobieren können. Diese Annahme sollte daher quantitativ-experimentell überprüft werden.

H3) Bei menschlichen Influencern besteht ein höheres Maß an Selbst-Influencer-Kongruenz als bei virtuellen.

Stein et al. (2022) ermittelten eine höhere wahrgenommene Ähnlichkeit für menschliche Influencer im Vergleich zu virtuellen. Ähnlichkeit bezog sich dabei auf die Ähnlichkeit zum realen Selbst der Rezipienten. Im Rahmen dieser Studie soll geprüft werden, ob für die Kongruenz zum idealen Selbst ein ähnlicher Effekt besteht.

H4) Glaubwürdigkeit ist Mediator der Beziehung zwischen Influencertyp und

a) Einstellung gegenüber dem Influencer.

b) Einstellung gegenüber der Marke.

Glaubwürdigkeit konnte in einzelnen Studien als Mediator der Beziehung zwischen Influencertyp und Erfolgsgrößen wie Einstellungen oder Kaufabsicht identifiziert werden. So erwies sich bei Schouten et al. (2020) Vertrauenswürdigkeit, als Teilaspekt des Glaubwürdigkeitskonzepts, als Mediator des Einflusses des Kommunikatortyps (menschliche Celebrity vs. menschlicher Influencer) auf die abhängigen Variablen Einstellungen und Kaufabsicht. Inwieweit Glaubwürdigkeit auch den Effekt von menschlichen vs. virtuellen Influencern auf bestimmte Erfolgsgrößen mediiert, soll im Rahmen dieser Studie geprüft werden. Unter der Annahme, dass menschliche Influencer generell besser bewertet werden als virtuelle (H1) und für menschliche Influencer auch ein Vorteil hinsichtlich der Glaubwürdigkeit postuliert wird (H2), erscheint es plausibel, dass die Glaubwürdigkeit eine Mediator-Funktion einnimmt und somit zwischen Influencertyp und Influencererfolg vermittelt.

H5) Selbst-Influencer-Kongruenz ist Mediator der Beziehung zwischen Influencertyp und

a) Einstellung gegenüber dem Influencer.

b) Einstellung gegenüber der Marke.

Erste Hinweise auf die Rolle der Kongruenz ergeben sich aus der Studie von Stein et al. (2022), in der sich die wahrgenommene Ähnlichkeit als Mediator zwischen Influencertyp (menschlich vs. virtuell) und der parasozialen Interaktion erwies. Die parasoziale Interaktion kann als Größe gesehen werden, die Einfluss auf weitere Erfolgsgrößen im Celebrity und Influencer Marketing nimmt. So konnten Zhang et al. (2021) einen positiven Effekt der PSI auf die Einstellung gegenüber einer beworbenen Marke nachweisen. In einer Studie von Aw und Labrecque (2020) zeigte sich eine stärkere Verbundenheit mit einer Celebrity in Abhängigkeit von der empfundenen parasozialen Interaktion. Deshalb wird angenommen, dass Effekte, die sich auf die parasoziale Interaktion beziehen, auch für Einstellungsgrößen gelten, die von dieser beeinflusst werden.

4. METHODE

Die Hypothesen wurden im Rahmen einer quantitativen Online-Studie mit experimentellem Untersuchungsdesign geprüft. Hierbei wurde der Influencertyp (real menschlich vs. virtuell) systematisch im Rahmen eines Within-Designs variiert, sodass jede Testperson sowohl mit einem menschlichen als auch mit einem virtuellen Influencer konfrontiert wurde. Die Reihenfolge der Influencertypen wurde mittels der Randomisierungsfunktion des genutzten Onlinebefragungstools Unipark (EFS Survey von Tivian) randomisiert.

Da es sich bei Instagram um einen besonders intensiv für Influencer Marketing genutzten Kanal handelt, wurden die Influencer im Erscheinungsbild von Instagram präsentiert. Je nach angegebenem Geschlecht wurden den teilnehmenden Personen männliche oder weibliche Influencer gezeigt. Personen, die sich als divers eingestuft hatten, wurde per Zufall eines der Influencergeschlechter zugewiesen. Aufgrund ihrer Ausgereiftheit wurden als virtuelle Influencer Lil Miquela (weiblich) und Blawko (männlich) genutzt. Mit Blick auf die interne Validität des Untersuchungsdesigns wurden menschliche Influencer-Pendants gesucht, die diesen beiden virtuellen Influencern möglichst ähnlich sind. Aufgrund von Aussehen und generellem Stil wurden hierfür Lori Harvey (weiblich) und Pierre Laurent (männlich) ausgewählt.

Zur Vorstellung der Influencer wurden im Rahmen der Befragung pro Influencer neun Fotos ausgewählt und im üblichen Layout eines Instagram-Profils dargestellt, wobei sichergestellt werden sollte, dass Motive und Szenen für reale und virtuelle Influencer jeweils hohe Ähnlichkeit aufwiesen. Um Effekte auf die Wahrnehmung von Marken beurteilen zu können, wurden ergänzend zu den Profilbildern Postings entwickelt, in denen eine bestimmte Marke beworben wurde. Pro Geschlecht wurden zwei Postingtexte erstellt, die per Zufall jeweils dem menschlichen beziehungsweise dem virtuellen Influencer zugewiesen wurden. Die Texte wurden zudem per Zufall mit je einer von zwei Marken kombiniert, sodass alle Teilnehmenden bei den jeweils gezeigten zwei Influencer-Auftritten zwei unterschiedliche Marken zu bewerten hatten. Für weibliche Influencer wurde eine Handtasche mit den zugewiesenen Markennamen Dario Dolcetti und Beyond Precious verwendet, für die männlichen Influencer Schuhe mit den Markenbezeichnungen Bexley und Legero. Es wurden

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bewusst Markennamen geringerer Bekanntheit gewählt, um eine Beeinflussung der Markenwahrnehmung durch die experimentelle Manipulation zu ermöglichen. Bei sehr bekannten Marken muss hingegen davon ausgegangen werden, dass bereits eine gefestigte Einstellung zur Marke besteht, die im Rahmen einer experimentellen Manipulation kaum beeinflussbar wäre.

Abbildung 1 zeigt die Zusammenstellung der Informationen, mit denen den Befragten die Influencer-Auftritte in Verbindung mit Postingtexten zu zwei Marken präsentiert wurden. Der Influencertyp stellt die unabhängige Variable für die spätere Analyse dar. Um ein Messwiederholungsdesign zu ermöglichen, wurde mit unterschiedlichen Marken und Postings gearbeitet, die jedoch nicht miteinander verglichen werden sollten. Dadurch konnte jede teilnehmende Person zwei verschiedene Marken bewerten, die randomisiert in unterschiedlichen experimentellen Bedingungen dargeboten wurden. Wurde bei einer Person beispielsweise Marke A mit einem virtuellen Influencer in Verbindung gebracht, wurde Marke B mit einem menschlichen Influencer gekoppelt. Die Reihenfolgen der Influencer-Bedingungen sowie der Marken waren ebenfalls randomisiert.

Abbildung 1. Präsentation der Influencer
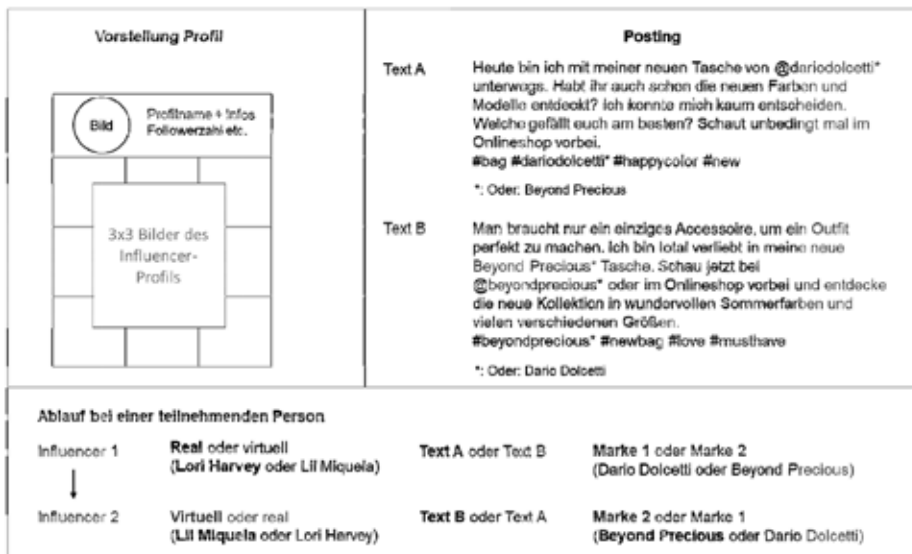
Die Glaubwürdigkeit der Influencer wurde mit 13 unipolaren Items erfasst. Für die beiden Unterdimensionen Vertrauenswürdigkeit und Expertise wurden Items auf Basis von Ohanian (1990) genutzt. Die Items der Unterdimension Attraktivität aus Ohanian (1990, Items: *attractive*, *classy*, *beautiful*, *elegant*, *sexy*) schienen teilweise für den Kontext Influencer Marketing sowie die ausgewählten Influencer weniger passend, weshalb zur Messung die Attraktivitäts-Skala nach Rodrigues et al. (2017) verwendet wurde.

Zur Bestimmung der Kongruenz zwischen dem Image des Influencers und dem eigenen gewünschten Selbstbild wurde das Vorgehen von Choi und Rifon (2012) genutzt, bei dem Influencer-Image und eigenes ideales Selbstbild getrennt mit Hilfe von 15 bipolaren Items gemessen wurden. Die Items wurden auf Grundlage der Arbeiten von Graeff (1996), Malhotra (1981) und Sirgy (1982, 1985) entwickelt. Der Gesamtwert pro Person für die Kongruenz ergab sich gemäß folgender Formel (Choi & Rifon, 2012):

$$\sum_{i=1}^{n} |C_i - I_i|$$

Es wurde also für jedes der 15 Attribute (i) die Differenz des Influencer-Images (C) und der eigenen Idealvorstellung (I) gebildet. Die Beträge dieser Differenzen wurden aufsummiert und ergaben den Gesamtwert. Höhere Werte stehen somit für höhere Abweichungen zwischen Influencer-Image und Ideal-Selbstbild und damit für eine geringere Kongruenz.

Die Einstellung gegenüber den Influencern wurde mit drei unipolaren Items auf Basis der Items von Moulard et al. (2014) gemessen. Die Einstellung zur Marke wurde mit drei unipolaren Items aus der Studie von De Veirman et al. (2017) erfasst.

Die Items aller Konstrukte hatten fünf Abstufungen, wobei die unipolaren Items die Pole 1 = *stimme gar nicht zu* und 5 = *stimme voll und ganz zu* aufwiesen. Bis auf die Kongruenz zwischen Influencer und Selbstbild waren die aus dem Englischen stammenden Items bereits im Rahmen einer anderen Studie (Zagermann, 2018) mittels Übersetzung und Rückübersetzung ins Deutsche übertragen worden. Für das Konstrukt der Kongruenz erfolgte eine eigene Übersetzung. Tabelle 1 zeigt einen Überblick über die Konstrukte und ihre Items.

Neben den Konstrukten wurden demografische Angaben wie Alter und Geschlecht erfasst. Ebenso wurde erfragt, welche Social-Media-Plattformen genutzt werden (*Welche der folgenden Social-Media-Plattformen nutzt Du?* Zur Auswahl u. a. *Instagram*) und ob einem Influencer auf Instagram gefolgt wird (*Folgst Du einem oder mehreren Influencern auf Instagram? Ja/Nein*)

Die Befragung startete mit Fragen zur Social-Media-Nutzung sowie zum Geschlecht, das zur Zuweisung der Influencer erforderlich war. Danach folgten die Präsentation der Influencer sowie die Bewertung von Glaubwürdigkeit und Image des Influencers, gefolgt von der Messung der Einstellung zu Influencer und Marke. Im Anschluss wurde das ideale Selbstbild erfragt.

Tabelle 1. Konstrukte und Items

Skala	Items
Glaubwürdigkeit	*Inwiefern stimmst du den folgenden Aussagen zu?*
	Influencer XY…
	Vertrauenswürdigkeit
	ist vertrauenswürdig
	ist ehrlich
	ist aufrichtig
	ist zuverlässig
	Expertise
	ist ein*e Experte*Expertin
	hat Erfahrung
	hat viel Wissen
	ist qualifiziert
	ist geschickt
	Attraktivität
	ist schön
	ist angenehm
	ist ansprechend
	ist attraktiv

Kongruenz Influencer – ideales Selbst	Ideales Selbst: *Bitte gib nachfolgend Dein gewünschtes Selbstbild von Dir an. Info: Das gewünschte Selbstbild bezieht sich nicht darauf, wie du Dich selbst objektiv wahrnimmst, sondern darauf, wie du Dich gerne wahrnehmen würdest.*
	Image Influencer: *Bitte gib an, wie du das Image von Influencer XY wahrgenommen hast.*
	robust/zart
	reizbar/ruhig
	angenehm/unangenehm
	dominierend/unterwürfig
	sparsam/gönnerisch
	freundlich/unfreundlich
	modern/altmodisch
	organisiert/unorganisiert
	rational/emotional
	jugendlich/reif
	förmlich/leger
	orthodox/liberal
	komplex/einfach
	eintönig/facettenreich
	bescheiden/eingebildet
Einstellung gegenüber Influencer	Inwiefern stimmst du den folgenden Aussagen zu?
	Ich mag XY.
	XY finde ich gut.
	XY ist vorteilhaft.
Einstellung gegenüber Marke	*Inwiefern stimmst du den folgenden Aussagen zu?*
	Die Marke XY ist vorteilhaft.
	Die Marke XY ist sympathisch.
	Die Marke XY ist gut.

Testpersonen für die Studie wurden über das Studierenden-Panel der Hochschule akquiriert, das aus freiwilligen Mitgliedern besteht, die sich bereiterklärt haben, regelmäßig zu Onlinebefragungen eingeladen zu werden. Eine weitere Streuung erfolgte über Social-Media-Kanäle des Forschungsteams, sodass es sich bei der Stichprobenauswahl um Convenience Sampling handelte.

5. ERGEBNISSE

Vor der Datenanalyse wurden die Daten nach mehreren Kriterien bereinigt. So wurden unvollständige Fragebögen ausgeschlossen und nur Personen einbezogen, die angaben, Instagram zu nutzen und mindestens einem Influencer zu folgen. Fälle mit unrealistisch kurzer Bearbeitungsdauer (< 5 min) sowie ein Fall, bei dem die Bilder zu den Influencern nicht korrekt angezeigt wurden, wurden ebenfalls aus dem Datensatz entfernt. Final lagen nach der Datenbereinigung 168 Fälle vor (128 weiblich, 40 männlich, 0 divers) mit einem Altersdurchschnitt von 22,2 Jahren und einem hohen Anteil an Studierenden (79,8 %, $n = 134$).

In Abhängigkeit von Geschlecht und Reihenfolge wurden den Befragten in den beiden experimentellen Bedingungen (Präsentation eines menschlichen vs. eines virtuellen Influencers) unterschiedliche Influencer (männlich/weiblich) und Marken zugeordnet. Da es sich bei Influencergeschlecht und Marke nicht um unabhängige Variablen handelte, die untersucht werden sollten, erfolgte im Rahmen der Analyse keine Differenzierung nach diesen Merkmalen. Somit lagen im Datensatz für die einzelnen Konstruktitems pro Person jeweils zwei Werte vor – ein Wert für die Bewertung des menschlichen Influencers und einer für den virtuellen Influencer.

5.1 Interne Konsistenz der Skalen

Zur Prüfung der internen Konsistenz der Multi-Item-Skalen zu den einzelnen Konstrukten wurden für die Items jeweils eines Konstrukts ein Cronbachs-Alpha-Wert berechnet. Da alle Personen einen menschlichen und einen virtuellen Influencer bewerteten, wurden die Cronbachs-Alpha-Werte getrennt nach diesen zwei Bedingungen berechnet (siehe Tabelle 2). Alle Werte lagen über 0,7, sodass von einer akzeptablen internen Konsistenz ausgegangen werden und für jedes Konstrukt Mittelwerte über alle Items gebildet werden konnten, die als Variablen in die weitere Analyse eingingen.

Tabelle 2. Cronbachs-Alpha-Werte der Konstrukte

Konstrukt	α_m	α_v
Glaubwürdigkeit	,89	,92
Einstellung gegenüber Influencer	,82	,86
Einstellung gegenüber Marke	,87	,92

$\alpha_{m/v}$: Cronbachs-Alpha-Werte der menschlichen/virtuellen Influencer.

5.2 HYPOTHESENPRÜFUNG

Die Hypothesen wurden im Rahmen mehrerer Mediatormodelle geprüft. Aufgrund des Messwiederholungs-Untersuchungsdesigns wurde das MEMO-RE-Makro für SPSS (MEdiation and MOderation analysis for REpeated measures designs; Montoya & Hayes, 2017) verwendet, mit dem eine Mediatorwirkung in einem Untersuchungsdesign mit zwei Within-Subjects-Bedingungen untersucht werden kann (Modell 1, 5.000 Bootstrapping Samples).

Für die beiden abhängigen Variablen Einstellung gegenüber dem Influencer und Einstellung gegenüber der Marke sowie die beiden Mediatoren Glaubwürdigkeit und Kongruenz wurden getrennte Modelle berechnet (also je ein Modell für Glaubwürdigkeit sowie Kongruenz für jede der beiden abhängigen Variablen). Der Influencertyp (menschlich vs. virtuell) stellte in den Modellen jeweils die unabhängige Variable dar. Die Hypothesen H1a,b wurden über den Total Effect von der unabhängigen auf die abhängigen Variablen geprüft. Für H2 und H3 wurden die Pfade a der Modelle betrachtet; bei den Mediatorhypothesen H4a,b und H5a,b wurden die indirekten Pfade (ab) analysiert. Abbildung 2 zeigt das Forschungsmodell mit den Hypothesen und Pfaden.

Abbildung 2. Forschungsmodell
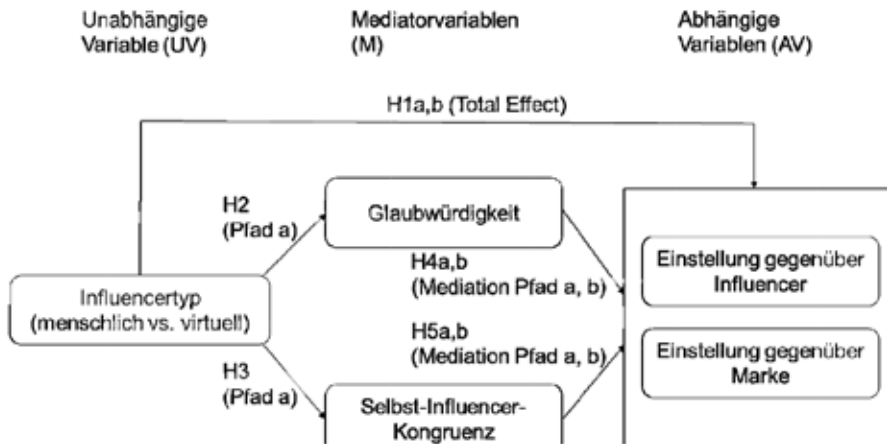
Tabelle 3 stellt die Ergebnisse der Prüfung der Total Effects der unabhängigen Variablen Influencertyp auf die beiden abhängigen Einstellungsvariablen dar (H1a,b). Beide Analysen ergaben einen signifikanten Effekt des Influencertyps, wobei bei beiden abhängigen Variablen menschliche Influencer besser bewertet wurden als virtuelle (Einstellung Influencer: $M_{menschl}$ = 2,57, $M_{virtuell}$ = 2,28; Einstellung Marke: $M_{menschl}$ = 2,69, $M_{virtuell}$ = 2,46).

Tabelle 3. Total Effect des Influencertyps

Variablen	Effekt (*SE*)	*t*	*p*	LLCI	ULCI
Einstellung Influencer	,29 (,07)	3,90	<,001	,14	,44
Einstellung Marke	,22 (,06)	3,57	<,001	,10	,35

Effekt: Unstandardisierte Schätzer; *SE*: Standardfehler; Signifikanzniveau $p < ,05$; LLCI/ULCI: 95 % Konfidenzintervalle, unteres/oberes

Pfad a der Mediatormodelle analysiert den Effekt des Influencertyps auf die Mediatorvariablen Glaubwürdigkeit und Kongruenz (H2, H3, siehe Tabelle 4). Dabei ergab sich lediglich ein signifikanter Effekt bei der Variable Glaubwürdigkeit. So wurden menschliche Influencer ($M_{menschl}$ = 3,06) als glaubwürdiger bewertet als virtuelle ($M_{virtuell}$ = 2,63). Bezüglich der Kongruenz unterschieden sich menschliche ($M_{menschl}$ = 17,38) und virtuelle Influencer ($M_{virtuell}$ = 17,05) nicht signifikant voneinander.

Tabelle 4. Einfluss des Influencertyps auf die Mediatorvariablen (Pfad a)

Variablen	Effekt (SE)	t	p	LLCI	ULCI
Glaubwürdigkeit	,43 (,06)	7,58	<,001	,32	,54
Kongruenz	,33 (,46)	,73	,466	-,57	1,23

Effekt: Unstandardisierte Schätzer; *SE*: Standardfehler; Signifikanzniveau *p* < ,05; LLCI/ULCI: 95 % Konfidenzintervalle, unteres/oberes

Bei der Analyse der indirekten Effekte (siehe Tabelle 5) zeigte sich, dass bei beiden Einstellungsvariablen das Konfidenzintervall für die Variable Glaubwürdigkeit ausschließlich im positiven Bereich lag, woraus geschlossen werden kann, dass Glaubwürdigkeit die Beziehung zwischen Influencertyp und den beiden Einstellungsgrößen signifikant mediiert. Im Gegensatz dazu schlossen die Konfidenzintervalle bei der Variablen Kongruenz die 0 mit ein, weshalb keine Mediatorwirkung für die Kongruenz gegeben ist.

Tabelle 5. Pfad b, indirekte Effekte und Varianzaufklärung Gesamtmodell

	Pfad b			Indirekte Effeke			
	Effekt (SE)	t	p	Effekt (SE)	LLCI	ULCI	R²
Einstellung Influencer							
Glaubwürdig-keit	,73 (,09)	8,40	<,001	,32 (,06)	,21	,44	,30
Kongruenz	-,08 (,01)	-6,92	<,001	-,03 (,04)	-,10	,05	,23
Einstellung Marke							
Glaubwürdig-keit	,32 (,08)	3,88	<,001	,14 (,04)	,06	,22	,12
Kongruenz	-,05 (,01)	-4,60	<,001	-,02 (,02)	-,06	,03	,12

Effekt: unstandardisierte Schätzer; *SE*: Standardfehler; Signifikanzniveau *p* < ,05; LLCI/ULCI: 95 % Konfidenzintervalle, untere/obere Grenze; R²: durch das Modell erklärter Varianzanteil

6. DISKUSSION

Die Mehrzahl der Hypothesen konnte bestätigt werden. So zeigte sich ein signifikanter Einfluss des Influencertyps auf die beiden Einstellungsvariablen (H1a,b). Wie postuliert, war die Einstellung gegenüber menschlichen Influencern positiver als gegenüber den untersuchten virtuellen Influencern. Auch die Marken, die durch menschliche Influencer beworben wurden, erhielten eine bessere Bewertung als durch virtuelle Influencer vorgestellte Marken. Die Überlegenheit der menschlichen Influencer deckt sich mit Befunden von

Franke et al. (2023), die in ihrer Studie das einstellungsnahe Konstrukt der Likeability maßen und ebenfalls eine Überlegenheit für menschliche Influencer fanden. Mit dem Vorteil der menschlichen Influencer bei der Bewertung der beworbenen Marke konnte gezeigt werden, dass die kommunikative Wirkung über die Bewertung des Influencers hinausgeht und auch Auswirkungen auf die Wahrnehmung des beworbenen Objekts hat.

Des Weiteren waren menschliche Influencer mit höherer Glaubwürdigkeit assoziiert als virtuelle (H2). Während in einigen Studien zu menschlichen Influencern nur Teilkomponenten des Glaubwürdigkeitskonstrukts verwendet wurden (z. B. Vertrauenswürdigkeit), wurde im Rahmen dieser Studie das breitere Konstrukt mit den Teildimensionen Vertrauenswürdigkeit, Expertise und Attraktivität untersucht. Der von Moustakas et al. (2020) vermutetete Nachteil von virtuellen Infuencern bezüglich der Glaubwürdigkeit konnte im Rahmen der vorliegenden Studie durch einen quantitativen Vergleich bestätigt werden.

Hinsichtlich der Kongruenz zwischen eigenem Idealbild und dem Image des Influencers zeigte sich entgegen H3 kein Unterschied zwischen menschlichen und virtuellen Influencern. Dieser Befund deckt sich nicht mit der Studie von Stein et al. (2022), in der eine höhere wahrgenommene Ähnlichkeit für menschliche Influencer ermittelt werden konnte. Die unterschiedlichen Befunde könnten damit zusammenhängen, dass Stein et al. (2022) die Ähnlichkeit zum tatsächlichen Selbst der Rezipienten untersucht hatten, während in der vorliegenden Studie die Kongruenz zwischen Influencer und dem idealen Selbst ermittelt wurde. Es wäre denkbar, dass die Diskrepanz zum realen Selbst bei der Bewertung von virtuellen vs. menschlichen Influencern eine größere Rolle spielt als das persönliche Ideal.

Bei der Analyse der indirekten Effekte konnte Glaubwürdigkeit als Mediator der Beziehung zwischen Influencertyp und Einstellung gegenüber den Influencern sowie gegenüber der Marke nachgewiesen werden (H4a,b). Während die Mediatorwirkung der Glaubwürdigkeit beim Vergleich von menschlichen Influencern und Celebrities bereits gezeigt werden konnte (Schouten et al., 2020), war eine entsprechende Wirkung hinsichtlich des Vergleichs menschlicher und virtueller Influencer zuvor noch nicht belegt worden.

Für die Kongruenz zeigte sich bei den beiden Einstellungsvariablen keine Mediatorwirkung, sodass die Hypothesen 5a,b nicht bestätigt werden konnten. Im Gegensatz dazu fanden Stein et al. (2022) eine Mediatorwirkung für

die wahrgenommene Ähnlichkeit bei der Beziehung zwischen Influencertyp (menschlich vs. virtuell) und der parasozialen Interaktion. Neben dem Aspekt, dass die Studie sich auf eine Einschätzung der Ähnlichkeit bezüglich des realen Selbstkonzepts bezog, wurde als abhängige Variable die parasoziale Interaktion statt der im Rahmen der vorliegenden Studie genutzten Einstellungsgrößen verwendet. Dies könnte eine Erklärung für die unterschiedlichen Befunde liefern.

Die beiden zentralen Ergebnisse der Studie sind einerseits die bereits in einzelnen anderen Studien gezeigte Überlegenheit von menschlichen gegenüber virtuellen Influencern sowie die zentrale Bedeutung der Glaubwürdigkeit auch beim Einsatz von virtuellen Influencern. Insbesondere die Mediatorwirkung des Konstrukts Glaubwürdigkeit konnte nach Kenntnis der Autoren erstmalig gezeigt werden. Da im Marketing von Unternehmen nach und nach auch virtuelle Influencer eingebunden werden, sollte der Glaubwürdigkeit besondere Aufmerksamkeit gewidmet werden, die sich als zentraler Wirkmechanismus erwiesen hat.

7. LIMITATIONEN UND AUSBLICK

Die Studie weist eine Reihe von Limitationen und Ansatzpunkten für künftige Forschung auf. Eine Grundproblematik bei Studien zum Vergleich von menschlichen und virtuellen Influencern besteht in der internen Validität des experimentellen Settings. In einem Experiment sollte sich idealerweise lediglich die zu untersuchende Größe zwischen den experimentellen Bedingungen unterscheiden. Menschliche und virtuelle Influencer sollten also hinsichtlich weiterer Faktoren maximal identisch sein. Daher wurde bei der Auswahl der Influencer darauf geachtet, dass menschliche und virtuelle Influencer bezüglich anderer Merkmale (z. B. Haarfarbe, generelle Erscheinung) möglichst ähnlich sind. Es kann aber nicht ganz ausgeschlossen werden, dass kleinere Unterschiede zwischen den Influencern zu den nachgewiesenen Effekten beigetragen haben, weshalb es sich empfiehlt, in künftigen Studien auch andere Influencer einzusetzen und die Ergebnisse zu vergleichen.

Die Kongruenz zwischen idealem Selbst und dem Image des Influencers hatte sich weder zwischen den beiden Influencertypen unterschieden, noch konnte eine Mediatorwirkung beobachtet werden. Da in der bisherigen Forschungsliteratur neben der Kongruenz zum idealen Selbst auch häufig die er-

lebte Ähnlichkeit zum realen Selbst untersucht wurde, sollte diese Komponente des Selbstkonzepts in künftigen Studien ebenfalls berücksichtigt werden.

Des Weiteren wurde für die Stichprobenakquise Convenience Sampling und somit keine Zufalls- oder Quotenauswahl genutzt, wodurch die Aussagen der Studie nicht als repräsentativ betrachtet werden dürfen. Allerdings war durch den hohen Anteil jüngerer Untersuchungsteilnehmer zwischen 20 und 24 Jahren die Zielgruppe, bei der das größte Potential für das Marketing mit virtuellen Influencern gesehen wird, stark vertreten (Moustakas et al., 2020).

Bei den Erfolgsgrößen zur Messung der kommunikativen Wirkung wurden ausschließlich Einstellungsgrößen verwendet (Einstellung gegenüber dem Influencer bzw. gegenüber der Marke). Die Kaufabsicht stellt eine weitere häufig untersuchte Größe im Influencer Marketing dar (z. B. Hermanda et al., 2019; Li & Peng, 2021). Da Erfolgsgrößen wie Einstellungen und Kaufabsicht oft deutlich miteinander korrelieren und gerade die Kaufabsicht meist noch von zahlreichen weiteren, nicht untersuchten Faktoren abhängt, wurden im Rahmen dieser Studie lediglich Einstellungsgrößen gemessen. Künftige Studien sollten jedoch auch weitere, verhaltensnähere Größen wie die Kaufabsicht oder auch das Engagement von Rezipienten (Brodie et al., 2011) gegenüber der Marke oder dem Influencer miteinschließen.

Wegen der bei virtuellen Influencern eingeschränkten Glaubwürdigkeit und der sich dadurch ergebenden negativen Effekte auf die kommunikative Wirkung sollte diesem Konstrukt künftig besondere Aufmerksamkeit gewidmet werden. Weil bei virtuellen Influencern keine realen Erfahrungen mit beworbenen Produkten möglich sind, sollten andere Wege gesucht werden, Glaubwürdigkeit zu erzielen. So betonen de Brito Silva et al. (2022) die Passung der Posts von virtuellen Influencern zu ihrem sonstigen Lifestyle und ihrer Persönlichkeit. Demnach käme dem Entwickeln einer in sich stimmigen Story rund um das virtuelle Leben der Influencer mit Blick auf deren Glaubwürdigkeit eine zentrale Rolle zu.

Neben der Glaubwürdigkeit ist davon auszugehen, dass bei der Wirkung von virtuellen Influencern weitere Faktoren eine Rolle spielen, die bislang noch wenig untersucht wurden. So tragen Lou et al. (2022) mehrere Themen zusammen, die im Umgang mit virtuellen Influencern motivieren könnten, wie etwa die Aspekte der Neuartigkeit und der Unterhaltung. Auch solchen Themen, die möglicherweise bei virtuellen Influencern besonders hohes Potential bieten, sollten sich künftige Forschungsarbeiten widmen.

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MULTI-SENSORIAL CUSTOMER EXPERIENCE FOR LUXURY BRANDS – THE IMPACT OF SENSORY CUES AND EMOTIONAL STATES ON STORE BROWSING TIME, PURCHASE INTENTION AND BRAND ATTITUDE OF GENERATION Z CUSTOMERS

Theresa SCHÜL
Pforzheim University, Business School

E-mail: schuelth@hs-pforzheim.de

Thomas CLEFF, Ph.D.
Pforzheim University, Business School

E-mail: thomas.cleff@hs-pforzheim.de

Nadine WALTER, Ph.D.
Pforzheim University, Business School

E-mail: nadine.walter@hs-pforzheim.de

Abstract

Luxury brands are challenged by two major trends: the increasing importance of their Generation Z customer base and a shift from luxury products towards luxury experiences. To overcome these challenges, applying multisensory marketing is a possible solution. This study analyzes the effects of five sensory cues (auditory, olfactory, haptic, visual, and gustatory) on the emotional states of Gen Z (arousal and pleasure) and on store browsing time, brand attitude, and purchase intention. Our findings of a standardized online survey (n = 182) reveal positive relationships between the five sensory cues and all-sensory cues and emotion and pleasure. On arousal, only all-sensory cues have a positive effect. In addition, emotion and pleasure positively enhance browsing

time, purchase intention, and brand attitude. Compared to that, arousal has no mediation effect. Based on these results, various empirical and managerial implications are provided.

Keywords: *Luxury brand, sensory cues, multisensory, arousal, pleasure, browsing time, purchase intention, brand attitude*

JEL Classification: M31, M37

1. INTRODUCTION

In today's market environment, brand competition is rising to capture consumers' attention and curiosity (Kilian & Hacopian, 2021: 310). Companies need to rethink their brand strategies to connect with their customers because "the market has changed from product-centric to customer experience-centric "(Podder & Paul, 2020: 35). Thus, delivering a multisensory experience is of increasing significance above all in the luxury industry, is valuable as the following quote highlights: *"luxury defines beauty; it is art applied to functional items. […] Luxury items provide extra pleasure and flatter all senses at once"* (Kapferer, 1997: 253; 2017: 238). Still, being able to touch a luxury product and experiencing a high level of service is an essential aspect of attracting people to buy a luxury brand. However, the online shopping experience is growing (Webber, 2018: 84). Due to that reason. Luxury brands must transform their retail stores into a place where they can build relationships with their customers, accompanied by "experiences that are relevant, intimate, and fun "(Podder & Paul, 2020: 34). When creating sensory cues in store, they must match with the different target groups of the respective brand, to increase the time of shoppers spending in the store and the likelihood of revisiting the store (Soars, 2009: 290). Generation Z, in the following Gen Z, born between 1995 and 2010 (Francis & Hoefel, 2018; Herhoffer, Meurer & Kuhlo, 2018: 5), is recognized as the fastest-growing segment in the luxury industry (Langer, 2019) as well as the segment already being equipped with a significant purchasing power of $44 billion (Mondres, 2019: 25; Priporas, Stylos & Fotiadis, 2017: 378). Because of this reason, it is unavoidable to gain a better understanding of this generation (Jain, Vatsa & Jagani, 2014: 18; Williams, 2015).

The objective of this study is to counteract the lack of research in sensory marketing (Hultén, 2011: 269; Hultén, Broweus & van Dijk, 2009: 158; Krishna, 2012: 347–348; Velasco & Spence, 2019a: 262) as well as the lack

regarding the Gen Z being a luxury brand customer (Shin, Eastman & Li, 2021, n/p). This study aims to gain more knowledge about the latter cohort on whether different sensory cues in a luxury brand store influence their emotional states and to test whether these states positively affect their browsing time, purchase intention, and brand attitude.

2. LITERATURE REVIEW AND HYPOTHESES DERIVATION

2.1. The Stimulus-Organism-Response Paradigm

The roots for multisensory marketing were established in 1974 by Mehrabian and Russell by forming the "*stimulus-organism-response (S-O-R) paradigm*" (Mehrabian & Russell, 1974, cited over Donovan & Rossiter, 1982: 36). The psychologists agree that the environment is a *stimulus* (S), which includes stimuli cues influencing the people's internal evaluations, thus the people's *organism* (O). The latter is responsible for the *response* (R) or, rather, behavior, either an approach or avoidance behavior.

Firstly, according to Mehrabian and Russell, the S of the environment is also named as the load, including the environment's "degree of novelty and complexity" (Mehrabian & Russel, 1974), cited over (Donovan & Rossiter, 1982: 40). The latter describes the number of cues characterizing the environment, whereas the novelty rates the level of "the unexpected, the surprising, the new [and] the unfamiliar" (Mehrabian & Russel, 1974, cited over Donovan & Rossiter, 1982: 40). Stimulus cues are for example music, color-arrangements, lightning, and scent, whereas different characteristics such as the tempo of music or the saturation of a color influence the cue itself (Donovan & Rossiter, 1982: 40; Spangenberg, Crowley & Henderson, 1996: 68). Secondly, the *organism* processes several evaluations such as the assessments of displays, packaging, prices and quality (Bellizzi, Crowley & Hasty, 1983: 22; Bellizzi & Hite, 1992: 349). These evaluations are based on the emotional state of the person, for which Mehrabian and Russell framed the so-called PAD acronym (Pleasure – Displeasure; Arousal – Nonarousal; Dominance -Submissiveness) (Mehrabian & Russel, 1974, cited over (Donovan & Rossiter, 1982: 38). The variables are factorially orthogonal and were validated by empirical and psychological support (Donovan & Rossiter, 1982: 38). Compared to that, Russell and Pratt (1980)

revealed, that in retail settings the two orthogonal dimensions, namely plea-sure, and arousal, are adequate to explain the emotional state of the people be-cause dominance is not only an effective response but rather cognitive (Russell & Pratt, 1980: 311)—lastly, the people's *response* results either in approach or in avoidance behavior. At this moment, the approach behavior represents the positive behavior, whereby the avoidance behavior represents the negative be-havior caused by the organism process before. Four aspects reveal the individual behavior: physical, exploratory, communication, and performance & satisfac-tion. This study focuses on physical, exploratory, and performance & satisfac-tion, indicating the approach behaviors to browse in-store and spend time and money (Donovan & Rossiter, 1982: 37; Spangenberg, Crowley & Henderson, 1996: 68). As the research of this study is applied to a retail setting in a luxury brand store, within the *S-O-R paradigm* by Mehrabian and Russell, the two-dimensional model for the emotions is applied (Russell & Pratt, 1980: 311), illustrated in Figure 1.

Figure 1. Modified S-O-R Model
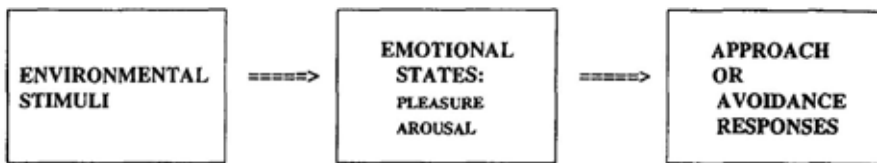
Source: Donovan et al., 1994: 284

2.2. Emotional States

2.2.1. Arousal

Arousal is defined as a "physiological feeling state mostly directly assessed by the verbal report" (Mehrabian & Russel, 1974, cited over Spangenberg, Crow-ley & Henderson, 1996: 68). This feeling state is concretely characterized as the perceived degree of excitement and activation (Donovan & Rossiter, 1982: 38) Arousal is also defined as being directly linked to load – a high load indicates a surprising or crowded environment, in which the customer feels stimulated or excited (Donovan & Rossiter, 1982: 40). Hence, a highly loaded environment causes a high level of arousal. The latter existing in a pleasant environment me-

diates approach behaviors, whereas a high-load arousing level in an unpleasant environment mediates avoidance behavior (Donovan & Rossiter, 1982: 55; 1982: 39; Spangenberg, Crowley & Henderson, 1996: 68). Therefore, an interaction between arousal and pleasure is discovered, although the two emotional dimensions are orthogonal (Donovan & Rossiter, 1982: 39). Contrarily, arousal needs to be seen as independent from pleasure (Russell & Mehrabian, 1977: 292). Generally, the level of arousal is processed via the limbic brain (Schreuder et al., 2016: 3). It is a "key emotional process" affecting the behavior of consumers towards luxury (Sung, Phau & Duong, 2021: 260).

2.2.2. Pleasure

Pleasure is characterized as the perceived degree of joy, happiness, or satisfaction based on the situation in the environment (Donovan & Rossiter, 1982: 38). With this, pleasure needs to be delimited from satisfaction concerning the personal evaluation of the customer experience (Roschk, Loureiro & Breitsohl, 2017: 229). Satisfaction is an "outward-looking judgment" (Roschk, Loureiro & Breitsohl, 2017: 229), whereby pleasure is defined as a judgment with a "subjective, inward focus" (Roschk, Loureiro & Breitsohl, 2017: 229). There are contradictory findings on the independency of arousal and pleasure (Hyun & Kang, 2014: 60; Russell & Mehrabian, 1977: 292) due to the interaction of both emotional states (Donovan & Rossiter, 1982: 39; 1982: 55; Hyun & Kang, 2014: 66; Ladhari, 2007: 1099; Spangenberg, Crowley & Henderson, 1996: 68).

Luxury customers search for pleasurable experiences when consuming luxury products (Barnier & Valette-Florence, 2013: 46; Kapferer & Michaut-Denizeau, 2016: 16), especially the younger generations (Batat, 2019: 202) to "live their parenthesis of pleasure" (Kapferer & Michaut-Denizeau, 2020: 38). This emotional state of pleasure is based on the stimulation of the senses during the luxury experience, underlining the approach of this study (Batat, 2019: 84; Turunen, 2018: 87).

The third variable of the emotional states used in the research of this study is the sum of arousal and pleasure, named emotion. This variable was formed to study the interaction of both (Donovan & Rossiter, 1982: 55; Russell & Mehrabian, 1987).

2.3.1. Auditory Sensory Cues

"You can look away from many things in a store, but you cannot listen away from sound" ~ John Baugher, AEI Music Network Inc. sales director from Seattle (Fickes, 1999).

This entrance quote highlights the importance of auditory cues. Focusing on a retail store, it must be distinguished between brand soundscape and background music. The former builds a "diskret akustische Klangkulisse[1]" leading to a familiar and relaxed feeling on the customer side (Ballhausen & Tallau, 2008: 54). Compared to that, concerning the background music, it is essential to consider that it should either fit the customer as well as the product, following a tailored-approach (Felser & Hehn, 2021: 83; Grossenbacher & Mäder, 2021: 33; Soars, 2009: 293) or instead choosing familiar music for the customers (Yalch & Spangenberg, 2000: 142). Besides, through the clock speed, the customer is influenced concerning the browsing tempo at the POS (Grossenbacher & Mäder, 2021: 33). According to Ballhausen and Tallau (2008), also the volume, pitch, rhythm, and harmony of the auditory cues have an impact on the emotional influence on the consumer (Ballhausen & Tallau, 2008: 52). In addition to that, the use of instrumental music is superior to vocal music as the latter distracts the consumer (Felser & Hehn, 2021: 83).

The research literature reveals that music positively affects consumers' emotional state (Steiner, 2021: 17) and shopping behavior (Biswas, Lund & Szocs, 2019: 49; Fulberg, 2003: 195–196). As a result of this, Vanderark and Ely (1993) found out that music with a fast rhythm leads to higher arousal among consumers (Vanderark & Ely, 1993, cited over Herrington and Capella, 1994: 54)). On the contrary, soothing music leads to a low level of arousal, still improving the cognitive activity (Chebat, Chebat & Vaillant, 2001: 121). Concerning young shoppers, Yalch and Spangenberg (1988) found out that music has a significant effect on arousal (Yalch & Spangenberg, 1988, cited over Lin, 2004: 169). Likewise, a study testing the presence (versus absence) of listening to music while driving a car also reveals an increase in the arousal level among young participants (Ünal et al., 2013: 62). On the contrary, a more recent study revealed significant positive effects of music on pleasure but not on arousal

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[1] German is the original language; translated in English: "discreet acoustic soundscape"

(Roschk, Loureiro & Breitsohl, 2017: 234). Therefore, the following hypotheses are derived:

H1: The presence (vs. absence) of **auditory sensory cues** at the luxury brand store's POS positively affects emotions concerning Generation Z.

H1a: The presence (vs. absence) of **auditory sensory cues** at the POS of the luxury brand store has a positive effect on arousal concerning Generation Z.

H1b: The presence (vs. absence) of **auditory sensory cues** at the POS of the luxury brand store has a positive effect on pleasure concerning Generation Z.

2.3.2. Olfactory Sensory Cues

"A human being can remember more than 10,000 different scents" (Hultén, Broweus & van Dijk, 2009: 7). This quote reveals the power of olfactory cues. In general, all scents can be categorized into one of six classifications according to the well-known "Geruchsprisma[2]" – the categories are[3]: "würzig", "blumig", "fruchtig", "harzig", "brenzlich" and "faulig" (Henning, 1916: 80–98). Mainly, there are two possibilities for the origin of the olfactory cues: the scent of the product itself and the scent in the environment, the so-called ambient scent (Kumar, 2017: 240). Focusing on the ambient scent, Spangenberg et al. (2006) distinguish between a natural and an artificial scent, whereby unpleasant ambient scent often occurs naturally (Spangenberg et al., 2006: 1281) and should be avoided (Fringes, 2021: 6–7; Grossenbacher & Mäder, 2021: 32). By injecting an artificial scent in a retail store, the scent intensity needs to be considered because the perception from the customer follows a U-shaped function, illustrating that only the middle of the U represents a pleasant olfactory stimulus (Velasco & Spence, 2019a: 275). An ambient scent is a valuable tool to differentiate retail stores because scents strengthen the brand's image and identity (Hultén, Broweus & van Dijk, 2009: 42).

"The sense of smell emotionally affects humans up to 75% more than any other sense" (Rathee & Rajain, 2017: 130). There is a direct link between individual emotion based on an olfactory cue and the amygdala triggering emotional memory (Herz, 2004: 222). Based on the latter aspect, scents can enhance posi-

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[2] German is the original language; translated in English: "odor prism"

[3] German is the original language; translated in English: "spicy", "flowery", "fruity", "resinous", "pungent" and "foul"

tive emotions (Soars, 2009: 294). Indeed, arousal and pleasure are influenced by olfactory cues (Chebat & Michon, 2003: 536). In addition, the presence vs. absence of scent attaches great importance (Spangenberg, Crowley & Henderson, 1996: 76–77), and the presence of scent positively yields pleasure (Roschk, Loureiro & Breitsohl, 2017: 236). Hence, the following hypotheses are derived:

H2: The presence (vs. absence) of **olfactory sensory cues** at the luxury brand store's POS positively affects emotions concerning Generation Z.

H2a: The presence (vs. absence) of **olfactory sensory cues** at the luxury brand store's POS positively affects arousal concerning Generation Z.

H2b: The presence (vs. absence) of **olfactory sensory cues** at the luxury brand store's POS positively affects pleasure concerning Generation Z.

2.3.3. Haptic Sensory Cues

"Touch plays an important role in increasing the consumer confidence towards the product" (Kumar, 2017: 240). The possibility of touching products in store strengthens the trust and call of the product (Hartmann & Haupt, 2016: 27; Kumar, 2017: 240). Hence, the touch sensor is also named "real sense" (Heller, 1982: 339) as well as "Nahsinn[4]" (Hartmann & Haupt, 2016: 26). With the sense of touch, human beings can feel and touch the geometry, the surface including textures, the materials with its consistency and elasticity, the weight of products and the temperature (Hartmann & Haupt, 2016: 26). When constructing a retail store. Acknowledging the seating experience with its materials and comfort is recommended as an essential haptic sensory cue (Haug, 2012: 179).

The following findings give consistency to the research. First, the feeling of a haptic warm temperature leads to emotional warmth, which positively affects emotional states (Zwebner, Lee & Goldenberg, 2014: 256). Further, it evokes superior product evaluation and, therefore, more approach behaviors – also called the "temperature-premium effect" (Zwebner, Lee & Goldenberg, 2014: 256). Second, a further study validates that a particular group of people experience high emotional responses through haptic sensory cues (Peck & Wiggins, 2006: 66). Therefore, the following hypotheses are derived:

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[4] German is the original language; translated in English: "near sense"

H3: The presence (vs. absence) of **haptic sensory cues** at the luxury brand store's POS positively affects emotions concerning Generation Z.

H3a: The presence (vs. absence) of **haptic sensory cues** at the luxury brand store's POS positively affects arousal concerning Generation Z.

H3b: The presence (vs. absence) of **haptic sensory cues** at the POS of the luxury brand store has a positive effect on pleasure concerning Generation Z.

2.3.4. Visual Sensory Cues

"Vision is the most powerful of our five senses" (Lindstrom, 2005a: 83). While visual sensory dominance is disputed (Calvert, Spence & Stein, 2004: 32; Shams, Kamitani & Shimojo, 2004: 32), it is rated as the essential sense compared to the other four (Schifferstein, 2006: 58). The visual cues generally include color, lightning, layout design, signs, symbols, and artifacts (Bitner, 1992: 66). This study emphasizes color and lightning as critical factors in a retail environment. Starting with the lightning, it turns out that people only perceive this cue when the lightning is disturbing, thus having a negative effect on consumers (Schreuder et al., 2016: 12). Nevertheless, lighting, especially daylight (Fringes, 2021: 13), is effective for unconsciously directing the way of the customer through the store (Grossenbacher & Mäder, 2021: 34). Colors are also a significant contributor to the emotional relationship between the brand and the consumer (Kumar, 2017: 239). Colors need to be distinguished between warm colors, including red and yellow being emotionally stimulating, and cold colors, like green or blue, evoking relaxing and calm feelings (Bellizzi, Crowley & Hasty, 1983: 41). Besides, the meanings of colors differ due to cultural influences (Aslam, 2005: 4–5) as well as through the development of time (Spence et al., 2014: 474–475).

Warm colors increase arousal (Bellizzi, Crowley & Hasty, 1983: 41). Also, the visual cue is dominant over the auditory cue concerning evoking emotions such as arousal and pleasure (Schreuder et al., 2016: 10). According to a study conducted in 2010, a color environment is leading to high arousal compared to an unaesthetic environment (Vieira, 2010: 377). Therefore, the following hypotheses are derived:

H4: The presence (vs. absence) of **visual sensory cues** at the luxury brand store's POS positively affects emotions concerning Generation Z.

H4a: The presence (vs. absence) of **visual sensory cues** at the POS of the luxury brand store has a positive effect on arousal concerning Generation Z.

H4b: The presence (vs. absence) of **visual sensory cues** at the POS of the luxury brand store has a positive effect on pleasure concerning Generation Z.

2.3.5. Gustatory Sensory Cues

The gustatory sense is probably *"the most emotionally appealing sense"* (Kumar, 2017: 240), whereby it has the most variation through biases such as personal preferences and demographic variables (Hultén, 2017: 9; Kumar, 2017: 240). There are five flavors,"süß, sauer, salzig, bitter und umami[5]"; umami is the less known, representing an intensive and savory flavor (Towers, 2014: 114). Appealing to the taste sense – although the product offering itself does not affect the taste – could still be efficient as the consumer experiences the brand in a further dimension (Hultén, Broweus & van Dijk, 2009: 10). In this context, the lifestyle and environment created through a restaurant, plays a significant role in forming a holistic experience (Hultén, Broweus & van Dijk, 2009: 11). Especially, luxury brands want to "seduce consumers by stimulating their taste" (Batat, 2019: 119).

In the field of gustatory cues, there has only been little research. However, eating certain food exaggerates the feeling of euphoria; for instance, the consumption of chocolate produces endorphins (Spence et al., 2014: 480). Hence, after the consumption of chocolate, consumers would be stimulated more positively toward a product or brand (Spence et al., 2014: 480). Likewise, it is strongly linked to the other senses affecting emotions (Kumar, 2017: 240; Rathee & Rajain, 2017: 126). Thus, the following hypotheses are derived:

H5: The presence (vs. absence) of **gustatory sensory cues** at the luxury brand store's POS positively affects emotions concerning Generation Z.

H5a: The presence (vs. absence) of **gustatory sensory cues** at the POS of the luxury brand store positively affects the arousal of Generation Z.

H5b: The presence (vs. absence) of **gustatory sensory cues** at the POS of the luxury brand store has a positive effect on pleasure concerning Generation Z.

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[5] German is the original language; translated in English: "sweet, sour, salty, bitter and umami"

2.3.6. All-sensory Cues

"People perceive the world through all their senses simultaneously, so the more sensory an experience, the more engaging it will be" (Soars, 2009: 286). Therefore, stimuli towards all five senses lead to a reinforcement of the effects on our emotions and behavior by 10 to 12 times – this effect is called "multisensory enhancement" (Musiolik, 2020: 5) or "Superadditivität[6]" (Hartmann & Haupt, 2016: 40; Velasco & Spence, 2019b: 207). Indeed, multisensory cues are even faster and more strongly anchored in the consumer's brain compared to one-sensory cues (Hartmann & Haupt, 2016: 41). However, it is also important to consider the opposite effect, the "sub-additive-effect" (Velasco & Spence, 2019b: 207). Hereby, the risk of mutually canceling the effects of at least two sensory cues exists. Consequently, the volume and intensity of the sensory stimuli play an essential role in effective multisensory brand experience (Wiedmann et al., 2018: 103), especially in the luxury industry (Wiedmann & Hennigs, 2012: 237–238).

The effect of "multisensory enhancement" (Musiolik, 2020: 5) is found concerning auditory cues and visual cues, which positively influence consumers' emotions (Geringer, Cassidy & Byo, 1996: 249). Further "super-additive-effects" (Hartmann & Haupt, 2016: 40; Velasco & Spence, 2019b: 207) are revealed by combining olfactory and visual cues (Lwin, Morrin & Krishna, 2010: 325). Likewise, the integration of olfactory and auditory cues significantly affects the customer's perception of the POS (Mattila & Wirtz, 2001: 285; Morrison et al., 2011: 562). The emotions evoked are positive; thus, the POS is more attractive to the consumer. Therefore, the following hypotheses are derived:

H6: The presence (vs. absence) of **all-sensory cues** at the luxury brand store's POS positively affects emotions concerning Generation Z.

H6a: The presence (vs. absence) of **all-sensory cues** at the luxury brand store's POS positively affects arousal concerning Generation Z.

H6b: The presence (vs. absence) of **all-sensory cues** at the luxury brand store's POS positively affects pleasure concerning Generation Z.

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[6] German is the original language; translated in English: "super additivity"

2.4. Approach or Avoidance Responses

2.4.1. Browsing Time

The *response* (R) includes the construct browsing time as a possible approach/avoidance behavior. As part of shopping enjoyment, browsing behavior at hunting for bargains (Cox, Cox & Anderson, 2005: 257). Likewise, browsing is about having an interest concerning products evoked by demographics, information searching, or WOM (Bloch & Richins, 1983: 392). When consumers are browsing in-store, there is no guarantee for a purchase intention (Bloch & Richins, 1983: 392), only a "possibility of making purchases" (Lehtonen & Mäenpää, 1997: 144). Nevertheless, there are at least two reasons why a high browsing time is favorable for brands: first, purchases are still likely to happen, probably at a later point of time, because consumers gather information supporting the recognition and recall of the brand (Bloch & Richins, 1983: 392). Second, the role of opinion leadership as consumers tends to be influenced by other consumption behaviors (Robertson, 1984: 486).

According to Helmefalk (2019), multisensory cues directly influence browsing behavior in a retail store (Helmefalk, 2019: 259). Compared to that, the mediating role of emotion, arousal, and pleasure is discovered concerning auditory cues: especially slow music leads to emotional responses affecting the shopping time in the store (Andersson et al., 2012: 556; Milliman, 1982: 90–91, 1986: 288; Yalch & Spangenberg, 2000: 142). Also, pleasure had a positive effect on browsing time (Donovan et al., 1994: 291; Sweeney & Wyber, 2002: 63). Therefore, the following hypotheses are derived:

H7: The higher the **emotion**, the higher the browsing time of Generation Z in the luxury brand store.

H7a: The higher the **arousal**, the higher the browsing time of Generation Z in the luxury brand store.

H7b: The higher the **pleasure**, the higher the browsing time of Generation Z in the luxury brand store.

2.4.2. Purchase Intention

The term purchase intention is a second construct of the approach/avoidance behaviors. Purchase intention is defined as an "assumption of a pending

transaction" (Chang & Wildt, 1994: 20), often being an "important indicator of actual purchase" (Chang & Wildt, 1994: 20). Ajzen (1991) proved this definition as it is the "intention to perform a given behavior" (Ajzen, 1991: 181). Intentions are explained by "how hard people are willing to try [and] [..] how much of an effort they are planning to exert" (Ajzen, 1991: 181). The higher the initial intention, the higher the likelihood of a behavior (Ajzen, 1991: 181). Hereby, factors influencing the luxury purchase intention were discovered, such as "cultural orientation, intrinsic factors, extrinsic factors, and resources" (Jain, Khan & Mishra, 2015: 153). The intrinsic factors attach great importance in this study as they include the emotional values of pleasure being the motivation for purchasing a luxury good (Jain, Khan & Mishra, 2015: 143; Kapferer & Michaut-Denizeau, 2020: 38; Tsai, 2005: 437; Vigneron & Johnson, 2004: 490–491).

According to Dubé et al. (1995), the purchase intention is independent of a consumer's level of pleasure and arousal (Dubé, Chebat & Morin, 1995: 314). Contrary to that finding, other authors found out that the emotional state of pleasure leads to a higher amount of money spent (Donovan et al., 1994: 291; Sweeney & Wyber, 2002: 63). Music negatively affects pleasure, although mediating a higher purchase intention (Andersson et al., 2012: 559). Compared to that, music positively affected arousal, mediating the purchase intention, but only because of the moderating variable of gender (Andersson et al., 2012: 559). That arousal can have a positive effect on money spent in-store is also found by Sherman and Mathur (1997: 373). Hence, the following hypotheses are derived:

H8: The higher the **emotion**, the higher the purchase intention of Generation Z in the luxury brand store.

H8a: The higher the **arousal**, the higher the purchase intention of Generation Z in the luxury brand store.

H8b: The higher the **pleasure**, the higher the purchase intention of Generation Z in the luxury brand store.

2.4.3. Brand Attitude

The concept of brand attitude is a further possible approach/avoidance behavior. Fishbein and Ajzen (1975) defined attitude as "a function of his salient

beliefs at a given point in time" (Fishbein & Ajzen, 1975: 222). Later, attitude is explained by "an individual's internal evaluation of an object" (Mitchell & Olson, 1981: 318), whereas the object often is a branded product (Mitchell & Olson, 1981: 318). Besides, brand attitude is referred to as a "relatively stable and enduring" (Mitchell & Olson, 1981: 318) behavioral predisposition, thus being a reliable predictor of the final consumer behavior (Mitchell & Olson, 1981: 318). This prediction results in "determining the success or failure of a brand" (Bezbaruah & Trivedi, 2020: 301). In addition to that, Spears and Singh (2004) differentiate brand attitude from feelings evoked by brands: the latter are transitory and self-referent, in contrast to the attitude being relatively enduring (Spears & Singh, 2004: 55). Besides, the threshold for a favorable intent is lower for brand attitude than for behavior (Spears & Singh, 2004: 56). According to Rossiter (2014), brand attitude is *"buyer's evaluation of the brand concerning its expected capacity to deliver on a currently relevant buying motive"* (Rossiter, 2014: 537).

Concerning luxury, brand attitude studies have shown a positive relationship between pleasure resulting from hedonic experiences and the attitude towards luxury brands (Lee and Hwang, 2011: 664; Loureiro & Araújo, 2014: 399). An almost similar result is given by a study conducted in 2020, which reveals that positive emotions evoked through hedonistic motivations have a positive effect on brand attitude (Wu et al., 2020: 583). Also, regarding sensory cues, research done by Singh (2006) states that about 62-90% of the product evaluations are influenced by the colors of the visual cues (Singh, 2006: 783). Hence, colors affect the emotions mediating the attitude towards a product (Singh, 2006: 783). Therefore, the following hypotheses are derived:

H9: The higher the **emotion**, the higher the brand attitude of Generation Z towards the luxury brand.

H9a: The higher the **arousal**, the higher the brand attitude of Generation Z towards the luxury brand.

H9b: The higher the **pleasure**, the higher the brand attitude of Generation Z towards the luxury brand.

In summary, figure 2 illustrates the positive hypothesized relationships, building on the structure of the *S-O-R paradigm* (Mehrabian & Russell, 1974, cited over (Donovan & Rossiter, 1982: 36).

Figure 2. Research Model with Variable Specifications,
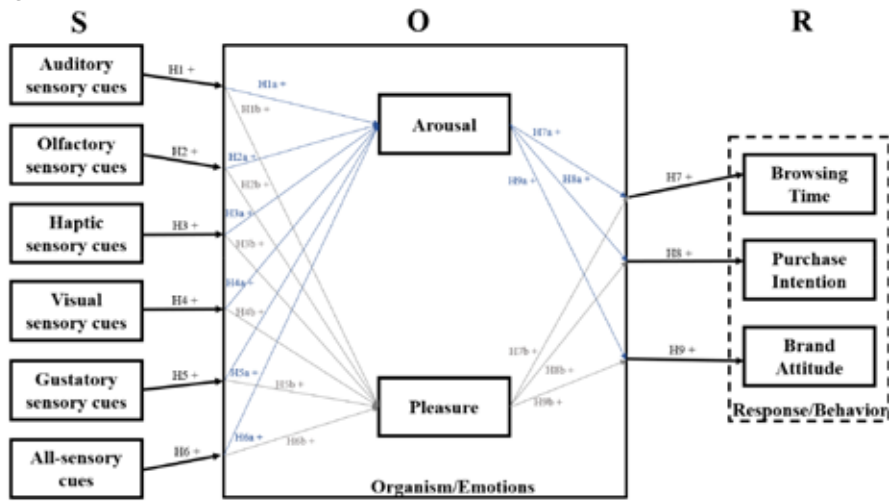
Source: own illustration

3. RESEARCH METHOD, DATA COLLECTION AND SAMPLING

As part of the present research study, respondents of Generation Z were invited to respond to a standardized online questionnaire. The survey on the online platform Questback Tivian was spread via the student panel StudiQUEST, a panel at Pforzheim University, and via different social media channels. The non-probability snowball sampling techniques have been applied for the sampling via social media channels. Different links to the online survey were sent to potential survey participants with the option to participate in the survey in either German or English. Therefore, this approach also allowed non-German-speaking members of Gen Z to participate in this survey.

The survey was structured as follows: After introducing the aim and structure of the survey and asking for the respondent's acceptance of the General Data Protection Regulation (GDPR), the participants were filtered by age only to gather data for respondents of Gen Z. Then, the sensory cues were presented sequentially, and the customer experience data was gathered for all-sensory cues. Each sensory cue was supported by a narrative using pictures from the luxury brand store Loro Piana (Loro Piana, 2022) and high-quality meals and beverages from Ruinart (Ruinart, 2022). The luxury brand's name or logo was

not shown to avoid possible biasing effects. In addition, cues were reinforced by a 30-second audio tone. In the second part of the survey, the participants were asked to assess their emotional state of arousal and pleasure, browsing time, purchase intention, and brand attitude. For all measured constructs, the order of items was randomized to avoid "sequence effects".

Throughout the questionnaire, 5-point scales were chosen from the literature without any adaptation. Specifically, the 5-point Likert scale measured all **five sensory cues**, **all-sensory cues,** and **browsing time**. One was coded as *strongly disagree* and five as *strongly agree*. The 5-point semantic differential scale was applied to measure **arousal**, **pleasure**, **purchase intention,** and **brand attitude** (coded as one = more negative items; coded as five = more positive items). The option I don't know has been provided for all scales and coded as missing value (coded as six). During subsequent factor analyses, the missing values were replaced by the respective mean value of the given item. The item *dull–jittery* of the construct arousal had 58 missing values indicating comprehension problems for the respondents, so the authors decided to eliminate this item from the analyses. An overview of all the construct's measurements is illustrated in the appendix. In this study, all the 5-point scales are treated as interval-scaled, assuming an equidistance between the interval points (Cleff, 2015: 21; 2015: 41; Janssens et al., 2008: 255). As the survey has been translated into English, the "back-translation technique" was applied (Craig & Douglas, 2005: 256–257; Cleff, 1997)to detect inconsistencies and eliminate possible ambiguities.

In the last section of the standardized online survey, the respondents should indicate if all the pictures and the sound were displayed correctly. Before closing the survey with demographic questions (gender, occupation, and nationality), the manipulation check tested whether the respondents followed the survey focused and consciously. The latter worked out because 81 percent of the respondents answered *yes*. Lastly, all questions were mandatory; before distributing the survey, a pre-test (n=4) was executed to refine the survey.

Although the study is focused on Gen Z, the sample had to be narrowed for the following reasons: First, participants in an online survey must consent to the General Data Protection Regulation, which they are only eligible to do from the age of 16. Second is the reference to the sense of alcohol. Alcoholic beverages can only be sold in Germany to persons older than 16.

4. RESEARCH RESULTS

The final sample of n=182 respondents was used for hypotheses testing. Profiling the final sample, the age of the respondents ranges between 18 and 26 years, with an average of 22.6 years. More than 2/3 of respondents are female (76 percent), and only one percent indicated diversity, resulting in 23 percent being male. Concerning occupation, most respondents are students (71 percent), followed by 22 percent of employed, four percent pupils, and one percent apprentices, whereby one percent of the respondents had *other occupations*. The majority of 167 respondents are German (92 percent), five are Swiss (three percent), four are French (two percent), and two are Bulgarian (one percent), beside one Belgian, one Chinese, one Mexican, and one Serbian respondent.

To test the validity of all items building the constructs of **the five sensory cues**, **all-sensory cues**, **emotion**, **arousal,** pleasure, **browsing time**, **purchase intention,** and **brand attitude**, three Principal Component Analyses with Varimax rotation were conducted. Each Kaiser-Meyer-Olkin (KMO) criterion scores above 0.5, proving the suitability of the data for the factor analyses (Backhaus et al., 2021: 392; Cleff, 2015: 220). Also, Bartlett's Test of Sphericity reveals a significant result ($p < .05$) for each of the Principal Component Analyses (Franck et al., 2018: 90). As the decision criterion, the Kaiser criterion is applied: all factors having an eigenvalue above one are adopted (Cleff, 2015: 224). As assumed, twelve factors were adopted. For the reliability analysis, Cronbach's Alpha is utilized; only for the internal consistency of the browsing time, the Pearson Correlation Coefficient is applied, as this construct is measured by only two items (Janssens et al., 2008: 247). All internal consistency values are assessed at least to be *moderate* (Cleff, 2019: 93; Hair et al., 2016; cited over Mat Nawi et al., 2020: 24).

To test the listed hypotheses, the following nine OLS regressions have been conducted: (1) Sensory Cues on Emotion, (2) Sensory Cues on Arousal, (3) Sensory Cues on Pleasure, (4) Emotion on Browsing Time, (5) Arousal and Pleasure on Browsing Time, (6) Emotion on Purchase Intention, (7) Arousal and Pleasure on Purchase Intention, (8) Emotion on Brand Attitude, and (9) Arousal and Pleasure on Brand Attitude. None of the regressions showed multicollinearity. Based on Cook's Distance, no outlier had to be eliminated (Hair et al., 1995 cited over Venter & Maxwell, 2000: 171).

4.1.1. The Impact of Sensory Cues on Emotion

The first multiple linear regression analyses the influence of the sensory cues on the dependent variable emotion. In this case, as for all subsequent regressions, a significance level of α = 0.05 was applied. The regression model is statistically significant (p_1 < .001) with an *adjusted R^2* of 0.385. All independent variables are statistically significant (p_2 < .050). Consequently, all hypotheses (**H1, H2, H3, H4, H5, H6**) are statistically proven (see Table 1). Thus, the presence of auditory, olfactory, haptic, visual, gustatory, or all-sensory cues in the luxury brand store significantly positively affects emotion regarding Gen Z.

Table 1. Regression Analysis – Sensory Cues on Emotion

Sensory Cues → Emotion						
	adjusted R^2	F	p_1	β	t	p_2
Model	0.385	5.194	.000			
Gustatory				0.264	4.124	0.000
Visual				0.347	5.566	0.000
Olfactory				0.130	2.088	0.038
Auditory				0.201	3.301	0.001
Haptic				0.152	2.513	0.013
All-sensory				0.370	5.848	0.000
Belgian				0.160	2.573	0.011

When comparing the effects between the sensory cues based on the *standardized coefficients β*, the factor all-sensory cues have the highest impact (β = 0.370). This is followed by the visual sensory cue (β = 0.347), the gustatory sensory cue (β = 0.264), the auditory sensory cue (β = 0.201), the olfactory sensory cue (β = 0.130), and lastly, the haptic sensory cue (β = 0.152). Lastly, the level of emotion of Belgian customers (n = 1) is, on average, around 0.2 units higher than that of other nationalities (β = 0.160).

4.1.2. The Impact of Sensory Cues on Arousal

The second multiple linear regression analyses the impact of the sensory cue factors on the dependent variable arousal. The regression model (table 2) is statistically significant (p_1 = .042), and the *adjusted R^2* yields 0.081.

Table 2. Regression Analysis – Sensory Cues on Arousal

Sensory Cues → Arousal					
	adjusted R^2	F	p_1	β	t	p_2
Model	0.081	1.591	.042			
Gustatory				0.089	1.135	0.258
Visual				0.102	1.335	0.184
Olfactory				-0.032	-0.420	0.675
Auditory				-0.008	-0.108	0.914
Haptic				0.006	0.087	0.931
All-sensory				0.173	2.241	0.026
Belgian				0.233	3.066	0.003

As a result, only hypothesis **H6a** is supported (p_2 = .026), whereby the rest of the hypotheses need to be rejected (**H1a, H2a, H3a, H4a, H5a**). Consequently, the presence of auditory, olfactory, haptic, visual, or gustatory sensory cues in a luxury brand store does <u>not</u> exert a significant positive effect on arousal concerning Gen Z. Finally, the level of arousal of a Belgian customer is, on average, 0.23 units higher compared to other nationalities (β = 0.233).

4.1.3. The Impact of Sensory Cues on Pleasure

The third multiple linear regression analyses the relationship between the impact of the sensory cue factors on the dependent variable pleasure. The regression model is statistically significant (p_1 < .001), and the *adjusted R^2* equals 0.405.

Table 3: Regression Analysis - Sensory Cues on Pleasure

Sensory Cues → Pleasure					
	adjusted R^2	F	p_1	β	t	p_2
Model	0.405	5.568	.000			
Gustatory				0.259	4.109	0.000
Visual				0.359	5.846	0.000
Olfactory				0.184	3.022	0.003
Auditory				0.273	4.560	0.000
Haptic				0.191	3.201	0.002
All-sensory				0.332	5.338	0.000
Other Occupation				0.179	2.522	0.013
Serbian				0.179	2.326	0.021
Age 18				-0.203	-2.267	0.025

All independent variables are statistically significant ($p_2 < .050$). Consequently, all hypotheses (**H1b, H2b, H3b, H4b, H5b, H6b**) are supported, so that the presence of auditory, olfactory, haptic, visual, gustatory sensory cues and all-sensory cues in the luxury brand store has a positive effect on pleasure regarding the Gen Z (see table 3). The visual sensory cues have the highest positive effect ($\beta = 0.359$) on Gen Z's pleasure, followed by all-sensory cues ($\beta = 0.332$). With ($\beta = 0.273$) and ($\beta = 0.259$), the auditory and gustatory sensory cues exert an average influence. The haptic ($\beta = 0.191$) and olfactory sensory cues ($\beta = 0.184$) give the weakest effects.

4.2. The Impact of (1) Emotion as well as of (2) Arousal and Pleasure on Browsing Time

Two multiple linear regression analyses of the impact of (1) emotion and (2) arousal and pleasure on the dependent variable browsing time. Both models are significant ($p_1 < .001$), and both *adjusted R^2* yield 0.214 and 0.239, respectively.

Table 4. Regression Analysis – (1) Emotion and (2) Arousal and Pleasure on Browsing Time.

	Emotion → Browsing Behavior						Arousal and Pleasure → Browsing Behavior					
	adj. R^2	F	p_1	β_e	t	p_2	adj. R^2	F	p_1	β_{ap}	t	p_2
Model	0.214	3.242	.000				0.239	3.469	.000			
Emotion				0.415	5.870	0.000						
Pleasure										0.430	6.266	0.000
Arousal										0.110	1.535	0.127
Male				-0.222	-3.116	0.002				-0.216	-3.084	0.002
Other Occupation				-0.167	-2.111	0.036				-0.186	-2.390	0.018
Belgian				-0.237	-3.433	0.001				-0.197	-2.830	0.005

Table 4 reveals that hypothesis **H7** and hypothesis **H7b** are supported due to statistical significance ($p_2 < .001$), whereby hypothesis **H7a** is rejected ($p_2 = .127$). Hence, the higher the emotion or pleasure, the higher the browsing time of Gen Z in the luxury brand store ($\beta_e = 0.415$; $\beta_{ap} = 0.430$). Men's browsing time is significantly lower ($\beta_e = -0.222$; $\beta_{ap} = -0.216$) than women or diverse customers.

4.3. The Impact of (1) Emotion as well as of (2) Arousal and Pleasure on Purchase Intention

Further, two multiple linear regressions analyze the impact of (1) emotion and (2) arousal and pleasure on the purchase intention factor. Both regression models are statistically significant ($p_1 < .003$; $p_1 < .001$) with an *adjusted R^2* of 0.129 and 0.155, respectively.

Table 5. Regression Analysis – (1) Emotion as well as (2) Arousal and Pleasure on Purchase Intention

Emotion → Purchase Intention							Arousal and Pleasure → Purchase Intention					
	adj. R^2	F	p_1	β_e	t	p_2	adj. R^2	F	p_1	β_{ap}	t	p_2
Model	0.129	2.214	.003				0.155	2.442	.001			
Emotion				0.385	5.169	0.000						
Pleasure										0.405	5.600	0.000
Arousal										0.108	1.435	0.153
Age=26				0.248	2.835	0.005				0.253	2.938	0.004

Based on Table 6, hypotheses **H8** and **H8b** are supported due to statistical significance ($p_2 < .001$), whereby hypothesis **H8a** gets rejected ($p_2 = .153$). Therefore, the higher the emotion or pleasure, the higher the purchase intention of Gen Z in the luxury brand store ($\beta_e = 0.385$; $\beta_{ap} = 0.405$).

4.4. The Impact of (1) Emotion as well as of (2) Arousal and Pleasure on Brand Attitude

The last two multiple linear regressions analyze the impact of (1) emotion and (2) arousal and pleasure on brand attitude. Both regression models are statistically significant ($p_1 < .001$) with an *adjusted R^2* of 0.204 and 0.307, respectively.

Table 6. Regression Analysis – (1) Emotion as well as (2) Arousal and Pleasure on Brand Attitude

	Emotion → Brand Attitude						Arousal and Pleasure → Brand Attitude					
	adj. R^2	F	p_1	β_e	t	p_2	adj. R^2	F	p_1	β_{ap}	t	p_2
Model	0.204	3.113	.000				0,307	4,494	.000			
Emotion				0.463	6.512	0.000						
Arousal										0.029	0.425	0.672
Pleasure										0.560	8.554	0.000
Bulgarian										0.129	1.987	0.049

Based on the regression analysis, hypothesis **H9** and **H9b** are supported (p_2 < .001), whereby hypothesis **H9a** is rejected (p_2 = .672). Therefore, the higher the emotion or pleasure, the higher the brand attitude of Gen Z towards the luxury brand (β_e = 0.463; β_{ap} = 0.560).

To summarize the findings, the final research model is illustrated (figure 3). Only the significant relationships are shown, highlighted by the p-values. Additionally, the *standardized coefficient β* underlines each effect, and the dummy variables are highlighted in light yellow.

Figure 3. Final Research Model

* p-value < .001   ** p-value < .05
Source: own illustration

5. DISCUSSION

5.1. EMPIRICAL IMPLICATIONS

Compared to previous studies, this research includes the five sensory cues and the multisensory perception of all-sensory cues. Hence, the present research extends the findings in the sensory marketing research field, succeeding in counteracting the lack of research.

The research results demonstrate that non-significant relationships exist between the **five sensory cues**, **browsing time**, **purchase intention,** or **brand attitude** and **arousal**; only **all-sensory cues** have a significant positive relationship with **arousal**. These findings build the opposite to the results of studies conducted in the past, for instance, Ünal *et al.* (2013: 62), Vanderark & Ely (1993) cited over (Herrington & Capella, 1994: 54), Yalch and Spangenberg (1988) cited over (Lin, 2004: 169), Chebat and Michon (2003: 536), Michon, Chebat and Turley (2005: 580), Bellizzi, Crowley, and Hasty (1983: 41) and Vieira (2010: 377). On the contrary, consistent with past research findings from Chebat and Michon (2003: 536), Geringer, Cassidy, and Byo (1996: 249), and Soars (2009: 294), the present research implies that **emotion** is positively affected by the **five sensory cues** as well as through the perception of **all-sensory cues**. Also, each of the **five sensory cues** and **all-sensory cues** positively affects the level of **pleasure**. Such positive relationships coincide with prior research concerning visual, olfactory, and auditory sensory cues (Chebat & Michon, 2003: 536; Roschk, Loureiro & Breitsohl, 2017: 236) and with research about younger generations seeking pleasure during their luxury consumption (Batat, 2019: 202; Kapferer & Michaut-Denizeau, 2016: 16; 2020: 38). There is also consistency between the present results and prior researches concerning the influence of **emotion** on **browsing time**: the higher the level of emotion, the higher the browsing time in the store (Andersson et al., 2012: 556; Milliman, 1982: 90–91, 1986:288; Yalch & Spangenberg, 2000: 142). Also, **pleasure** has a significant positive relationship with **browsing time** being discovered in prior studies, too (Donovan et al., 1994: 291; Sweeney & Wyber, 2002: 63). Moreover, the research found that men's time spent in a store is lower compared to women (β_e = -0.222; β_{ap} = -0.216) is proved in various studies, too (Gül Savaskan & Cati, 2020: 268; Verde Group, Jay H. Baker Retailing Initiative and Women Certified, 2007: 1–7). The present results show a positive relationship between **emotion** and **purchase intention,** whereby in the past, neither a

positive nor a negative relationship was found (Dubé, Chebat & Morin, 1995: 314). Additionally, a positive relationship between **pleasure** and **purchase intention** is discovered. About the latter effect, there is inconsistency (Andersson et al., 2012: 559) and consistency (Donovan et al., 1994: 291; Sweeney and Wyber, 2002: 63) with past research findings. This research implies a positive relationship between **emotion** and **brand attitude,** like past findings (Wu et al., 2020: 583). Likewise, **pleasure** positively affects **brand attitude** toward a luxury brand, confirming the results from other studies (Lee & Hwang, 2011: 664; Loureiro & Araújo, 2014: 399; Wu et al., 2020: 583).

Moreover, the ranking of the influence of the five sensory cues on emotion and pleasure provides valuable insights for empiricism. It turns out that luxury brands should focus first on their visual sensory cues at the POE, followed by auditory and gustatory cues. To derive the generalizability of these rankings, further empirical research is needed.

5.2. Managerial Implications

In general, the results of this study provide marketing, retail, and event managers in the fashion and accessories luxury industry with essential guidelines. Gen Z is receptive to sensory cues influencing their emotional evaluation processes. Consequently, the states of emotion and pleasure are potent mediators to influence the behaviors of Gen Z. Hence, the following managerial implications are recommended, enhancing the level of pleasure being the most influential variable. The implications follow the descending order of the sensory cues.

Regarding the **visual sensory cues**, managers are advised to conceptualize a fashion luxury store with a clear and well-organized layout, whereby the use of saturated colors and no glaring white is suitable. Additionally, providing many visual textures in the store stimulates customers. For **auditory sensory cues**, the authors of this paper propose to play slow and classical background music enhancing the relaxation on the customer side and contributing to pleasure. As **gustatory sensory cues** have a strong positive effect, managers should consider a restaurant providing luxurious beverages and food compositions. The latter aspects should be highlighted as no previous study investigated the gustatory cue in a luxury retail environment about Gen Z. For the **haptic sensory cues**, luxury fashion brands should also make use of their diverse clothing materials such as cashmere, wool, leather, or silk presenting them in high-quality furnish-

ings with a pleasant surface like wood. Lastly, the authors recommend diffusing a new scent composition into the luxury store, enhancing pleasure with **olfactory sensory cues**. At this moment, it needs to be emphasized that the composition should fit the brand identity – preferably, it is a scent being sold by the brand itself, like in the form of a candle or scent diffuser.

As a result of the manipulation check, almost 20% of the respondents indicated either *no* or *I do not know*, although they evaluated the sensory cues positively. Hence, a further managerial implication is that the sensory cues do not have to be obvious, but understated could be sufficient, too. Since arousal only showed one instead of nine significant effects, the conclusion of neglecting this emotional state could be derived. However, most effects are positive, so it still should be a goal to achieve a certain level of arousal at the POE. Nevertheless, managers should question their objectives for their brand experience and whether a high level of arousal is desirable, as adjectives like frenzied or jittery also explain it.

Providing memorable experiences by attracting the five senses is inevitable for luxury brands as the increase in emotion and pleasure efficiently mediates Gen Z's browsing time, purchase intention, and brand attitude being important key performance indicators for sales and future business growth. Therefore, the findings stress the importance of using sensory cues in luxury retail, differentiating from other luxury brands by providing authentic and touchable experiences that strengthen the brand image (Cleff, Lin & Walter, 2014), and recruiting and tying their future customers.

5.3. Limitations

The research of this study focuses on Gen Z. However, the complete age range of this cohort is not represented in the study. First, the 11 to 15 years old are neglected. Second, the chosen sampling techniques did not reach survey participants aged 16 or 17. In addition to that, there is an inequality in gender representation: 2/3 of the respondents are female, whereas only 1/3 are male or diverse. Hence, the results are distorted.

Regarding the survey structure, the authors remark that every participant experienced the sensory cues in the same order, accompanied by a specific story underlining each cue. Consequently, order effects could have happened due to a

non-randomization of the presentation of each sensory cue, including the pictures. In addition, the participants were not able to smell the scent, taste the champagne and the meals, or touch the clothing or furniture. Thus, the evaluations in the survey of the olfactory, gustatory, and haptic sensory cues only rely on the imaginations of the respondents. Also, one person indicated that the music did not play correctly. As the answers concerning the auditory cue were not missing, the authors decided to keep the evaluations of this person.

Furthermore, the data set includes many missing values being replaced by the respective means, biasing the research results. Besides, one item-pair describing arousal needed to be neglected from the analysis as the number of missing values was disproportionally high. Lastly, the authors want to emphasize the fact that the results of the study are not representative due to the use of non-probability sampling techniques, diminishing the validity of the research results.

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Appendix – Scale Derivation Overview

Theoretical construct	Items (Original language)	Items (Translated items)	Scale	Source	Adaptation
Arousal	calm, excited relaxed, stimulated sluggish, frenzied dull, jittery sleepy, wide-awake unaroused, aroused	ruhig, aufgeregt entspannt, angeregt träge, wild dumpf, kribbend schläfrig, hellwach nicht erregt, erregt	3-point semantic differential	van Lieshout and Devarasne, 1987, p.347 & validated in the luxury context by Hynes and Kong, 2014, p.64	The bipolar item pairs were turned for consistent coding (1 = more negative, 3 = more positive)
Pleasure	annoyed, pleased unhappy, happy unsatisfied, satisfied	ärgerlich, zufrieden unglücklich, glücklich unbefriedigt, befriedigt	3-point semantic differential	van Lieshout and Devarasne, 1987, p.347 & validated in the luxury context by Hynes and Kong, 2014, p.64	The bipolar item pairs were turned for consistent coding (1 = more negative, 3 = more positive)
Browsing Time	I like to spend much time browsing in this store I spend much time looking around or exploring this store (reverse)	Ich verbringe gerne viel Zeit damit, in diesem Store zu stöbern Ich möchte es vermeiden, mich in diesem Store umzusehen oder zu erkunden	5-point Likert Scale (1 = strongly disagree, 5 = strongly agree)	van Lieshout and Devarasne, 1987, p.347	The coding of the 5-point Likert scale was turned (>5 from 1 = strongly agree towards 1 = strongly disagree) to be consistent with the other 3-point Likert scale codings
Purchase Intention	How likely is that you purchase this luxury brand? unlikely, likely no chance, certain improbable, probable uninteresting, interesting bad, good	Wie wahrscheinlich ist es, dass Du diese Luxusmarke kaufst? unwahrscheinlich, wahrscheinlich ausgeschlossen, total sicher nicht wahrscheinlich, wahrscheinlich uninteressant, interessant schlecht, gut	5-point semantic differential	Schade et al., 2016, p.318	The time horizon of 3 months was deleted
Brand Attitude	unpleasant, pleasant unfavorable, favorable dislikable, likeable	unangenehm, angenehm unvorteilhaft, vorteilhaft unsympathisch, sympathisch	5-point semantic differential	Kellcar et al., 2021, p.957	No adaptation
Manipulation Check	Did you notice the music, the scent, the materials, the colours and the taste during the Shopping Experience? "Hast Du die Musik, den Duft, die Materialien, die Farben und den Geschmack während des Einkaufs wahrgenommen und konntest dementsprechend Deine Sinneseindrücke abrufen"	Asking for feeling and sensing was included	Yes, No, I don't know	Hoberdick and Bullion, 2017, p.35	

Theoretical construct	Items (Original language)	Items (Translated items)	Scale	Source	Adaptation
Auditory sensory cues	The music in the luxury brand store is very nice to listen to.	Die Musik in dem Luxusmarkenstore ist sehr schön anzuhören.	5-point Likert Scale (1 = strongly disagree; 5 = strongly agree)	Wiedmann et al., 2018, p.108	"Luxury hotels" replaced by "luxury brand store"
	The sound scape in the luxury brand store is very pleasant.	Die Klangkulisse in dem Luxusmarkenstore ist sehr angenehm.			
	The sounds in the luxury brand store are wonderful.	Die Klänge in dem Luxusmarkenstore sind wunderbar.			
	In the luxury brand store, very appealing tones can be perceived.	In dem Luxusmarkenstore können sehr ansprechende Töne wahrgenommen werden.			
Olfactory sensory cues	The scent in the luxury brand store is very pleasant.	Der Duft in dem Luxusmarkenstore ist sehr angenehm.	5-point Likert Scale (1 = strongly disagree; 5 = strongly agree)	Wiedmann et al., 2018, p.108	"Luxury hotels" replaced by "luxury brand store"
	The fragrance in the luxury brand store is very appealing.	Der Duft in dem Luxusmarkenstore ist sehr ansprechend.			
	In the luxury brand store, it smells very nice.	In dem Luxusmarkenstore riecht es sehr gut.			
	The odor in the luxury brand store is delightful.	Der Geruch in dem Luxusmarkenstore ist herrlich.			
	The aroma in the luxury brand store is very enchanting.	Das Aroma in dem Luxusmarkenstore ist sehr bezaubernd.			
Haptic sensory cues	The luxury brand store offers a cushy comfort.	Der Luxusmarkenstore bietet einen sehr angenehmen Komfort.	5-point Likert Scale (1 = strongly disagree; 5 = strongly agree)	Wiedmann et al., 2018, p.108	"Luxury hotels" replaced by "luxury brand store"
	The lounge areas in the luxury brand store are very cozy.	Die Loungebereiche im Luxusmarkenstore sind sehr gemütlich.			
	The furnishings in the luxury brand store are very nice to touch.	Die Möbel im Luxusmarkenstore sind sehr angenehm zum Anfassen.			
	The materials in the luxury brand store feel absolutely good.	Die Materialien im Luxusmarkenstore fühlen sich absolut gut an.			
	In the luxury brand store, the warmth of light feels very pleasant on the skin.	Die Wärme des Lichts im Luxusmarkenstore fühlt sich auf der Haut sehr angenehm an.			
Visually sensory cues	The appearance of the luxury brand store is very attractive.	Das Aussehen des Luxusmarkenstores ist sehr attraktiv.	5-point Likert Scale (1 = strongly disagree; 5 = strongly agree)	Wiedmann et al., 2018, p.108	"Luxury hotels" replaced by "luxury brand store"
	The luxury brand store is very nice to look at.	Der Luxusmarkenstore ist sehr schön anzusehen.			
	The luxury brand store has a premium design.	Der Luxusmarkenstore hat ein hochwertiges Design.			
	The luxury brand store is a feast for the eyes.	Der Luxusmarkenstore ist eine Augenweide.			
	The luxury brand store is a real eye-catcher.	Der Luxusmarkenstore ist ein wahrer Blickfang.			
	The luxury brand store has an appealing style.	Der Luxusmarkenstore hat einen ansprechenden Stil.			
Gustatory sensory cues	The meals in the luxury brand store are a real culinary delight.	Die Gerichte im Luxusmarkenstore sind ein wahrer kulinarischer Genuss.	5-point Likert Scale (1 = strongly disagree; 5 = strongly agree)	Wiedmann et al., 2018, p.108	"Luxury hotels" replaced by "luxury brand store"
	The meals in the luxury brand store are a real pleasure.	Die Gerichte im Luxusmarkenstore sind ein echter Genuss.			
	The food in the luxury brand store is very delicious.	Das Essen im Luxusmarkenstore ist sehr köstlich.			
	The beverages in the luxury brand store are very delicate.	Die Getränke im Luxusmarkenstore sind sehr delikat.			
	The food in the luxury brand store is very tasty.	Das Essen im Luxusmarkenstore ist sehr lecker.			
	My mouth is watering by looking at the menu in the luxury brand store.	Wenn ich mir die Menükarte im Luxusmarkenstore anschaue, läuft mir das Wasser im Mund zusammen.			
All sensory cues	The luxury brand store provides a culinary highlight.	Der Luxusmarkenstore bietet ein kulinarisches Highlight.	5-point Likert Scale (1 = strongly disagree; 5 = strongly agree)	Wiedmann et al., 2018, p.108	"Luxury hotels" replaced by "luxury brand store"
	The luxury brand store makes a strong impression on my senses.	Der Luxusmarkenstore macht einen starken Eindruck auf meine Sinne.			
	The luxury brand store is very interesting in a sensory way.	Der Luxusmarkenstore ist auf eine sinnliche Art und Weise sehr interessant.			
	The luxury brand store appeals to my senses.	Der Luxusmarkenstore spricht meine Sinne an.			

STORYTELLING AS A COMMUNICATION APPROACH FOR CRADLE TO CRADLE PRODUCTS IN THE CLOTHING INDUSTRY

Vivien Marie GUTZENTAT
Pforzheim University, Business School

E-mail: vivien@gutzentat.de

Kai Alexander SALDSIEDER
Pforzheim University, Business School

E-mail: kai.saldsieder@hs-pforzheim.de

Abstract

This paper offers an overview of the barely explored field of Cradle to Cradle (C2C) communication by investigating the suitability of the storytelling method in communicating the C2C concept to young fast fashion consumers. Since the clothing industry is one of the most environmentally damaging industries in the world, the introduction of circular concepts like C2C to fast fashion consumers, becomes increasingly important. To overcome barriers to consumer acceptance, like skepticism or a lack of knowledge, consumers have to be informed about C2C through extensive communication. Storytelling could be a suitable method to communicate C2C in a narrative and complexity-reducing way. Literature research and a qualitative study with five expert interviews were conducted. The first step identified requirements and corresponding guidelines for communicating C2C to consumers. In the second step, expert testimonies on the suitability for storytelling on each of the identified requirements for C2C communication were collected and evaluated. It was demonstrated that storytelling is suitable for communicating C2C to consumers. Especially for young fast fashion consumers, storytelling can create attention and awareness for the C2C concept. In addition, critical elements of a story were identified. Using them, we demonstrated that a C2C story could be constructed with a range of examples and recommendations for utilizing these elements within a C2C story. Future research can use the results to expand the knowledge about com-

municating circular concepts to consumers through experimentation with different story formats or communication methods to enhance the effectiveness of C2C communication. The limitations of this work arise from the fact that the explored field has hardly been researched or practiced so far. Therefore, experts were chosen for their knowledge of subareas.

„Aber weniger schlecht zu sein bedeutet, die Dinge so zu akzeptieren, wie sie sind, und zu glauben, schlecht konzipierte, zerstörerische Systeme seien das Beste, was die Menschheit hervorbringen könne. Doch genau darin kommt der eigentliche Fehler dieses Ansatzes zum Ausdruck, nämlich die fehlende Vorstellungskraft."

Braungart & McDonough, 2021:91–92

1. EINLEITUNG

„Fast-Fashion" beschreibt die kostengünstige Herstellung trendiger Massenbekleidung in Ländern mit geringer Bezahlung, welche von Konsumenten günstig erworben wird (Ellen MacArthur Foundation, 2017: 18; Jayot, 2020: 28). Für deren Herstellung werden endliche Rohstoffe verarbeitet, welche der Umwelt schaden (Bergmann, 2018: 288). Die Bekleidungsindustrie zählt auch deshalb zu einer der ressourcenintensivsten und umweltschädlichsten Industrien weltweit (Hemkhaus et al., 2019: 7), weshalb dort die Einführung zirkulärer Konzepte immer wichtiger geworden ist (Hemkhaus et al., 2019: 7; Niinimäki & Karell, 2020: 7), wie dem C2C-Konzept (Braungart & McDonough, 2021: 135–136).

Obwohl die Bekleidungsindustrie vermehrt Aufmerksamkeit für den Verbrauch endlicher Ressourcen erhält (Henninger et al., 2017: 2) und Konsumenten zunehmend besorgt sind (Hemkhaus et al., 2019: 26), setzen sie ihre Sorgen nicht in ihrem Kaufverhalten um (Bucklow et al., 2017: 57; Hemkhaus et al., 2019: 26). Es besteht eine Diskrepanz zwischen Einstellung und tatsächlichem Verhalten bei dem Kauf von nachhaltiger Kleidung (Han et al., 2017: 130), auch bei zirkulären Produkten (Calvo-Porral & Lévy-Mangin, 2020: 4). Um

Bewusstsein bei Konsumenten zu schaffen und diese zu zirkulären Konsumentscheidungen zu bewegen (Gözet & Wilts, 2022: 22), muss eine innovative und umfassende Kommunikation erfolgen (Ellen MacArthur Foundation, 2017: 28; Zylka et al., 2021: 4). Storytelling ist eine Methode, um neue Konzepte und Produkte zu werben (Frenzel et al., 2006: 224) und könnte das C2C-Konzept effektiv an Konsumenten kommunizieren.

2. THEORETISCHE GRUNDLAGEN

Storytelling wurde für die Kommunikation von C2C-Bekleidung an Konsumenten bisher nicht erforscht. Der Fokus liegt auf der Zielgruppe junger Fast-Fashion Konsumenten (18-30 Jahre) (Rückert-John et al., 2021: 43), da diese überdurchschnittlich viel neue Kleidung kaufen, welche sie nicht oder selten tragen (Rückert-John et al., 2021: 50) und wenig Wert auf Umweltverträglichkeiten legen (Rückert-John et al., 2021: 44). Die Forschungsfrage lautet:

FF: Wie geeignet ist Storytelling in der Kommunikation von C2C-Bekleidung an junge Fast-Fashion Konsumenten?

2.1. Cradle to Cradle

Es wird oft ein lineares Konsumprinzip (Cradle to Grave) genutzt: Konsumenten kaufen, benutzen und werfen das Produkt mit wenigen Ausnahme weg. Der anfängliche Wert des Rohstoffs geht verloren und das Produkt endet auf der Mülldeponie (Braungart & McDonough, 2021: 47–48).

Demgegenüber steht das öko-effektive Herstellen nach dem Konzept Cradle to Cradle, nach welchem Abfall nicht mehr existiert (Braungart et al., 2007: 1338; Braungart & McDonough, 2021: 135–136). Dazu nutzen Unternehmer abbaubare Materialien, die in den biologischen oder technischen Kreislauf zurückgeführt werden können, ohne an Qualität zu verlieren. So entsteht ein neues hochwertiges Produkt (Braungart & McDonough, 2021: 136). Braungart und McDonough (2021: 99) nennen das auch Upcycling.

Durch eine Zertifizierung der C2C-Produkte können Unternehmen ihre Produkte kontinuierlich verbessern und in den Leistungsstufen Bronze, Silber, Gold und Platin aufsteigen (C2CPII, 2021: 3). Das 2010 von William Mc-Donough and Dr. Michael Braungart gegründete Cradle To Cradle Products

Innovation Institute (C2CPII), führt die Zertifizierung durch, welche eine Gültigkeit von zwei Jahren hat (C2CPII, 2021: 2).

Dabei werden fünf Kriterien geprüft: Materialgesundheit, Kreislauffähigkeit, erneuerbarer Energien, Wassermanagement und sozialen Mindeststandards (C2CPII, 2021: 3; Fashion for Good, 2017: 8). Beispiele von Bekleidungsunternehmen, welche ihre hergestellte Bekleidung zertifizieren ließen, sind Trigema, Wolford oder C&A (Cradle to Cradle NGO, 2019: 48–53).

2.2. Storytelling

Storytelling kann als das Erzählen von Geschichten definiert werden (Hilzensauer, 2014: 87; Krüger, 2015: 76). Dabei verbinden Geschichten Fakten durch eine Erzählung, wodurch sich das Verständnis erhöht (Weick & Browning, 1986: 255), reduzieren Komplexität, während sie diese gleichzeitig darstellen (Frenzel et al., 2006: 44) und erleichtern das Merken von Informationen (Frenzel et al., 2006: 224). Geschichten sollen sogar besser merkbar sein, je emotionaler das Storytelling ist (Herbst, 2011: 31–33), denn sie „sprechen die emotionale Seite der Menschen an" (Hilzensauer, 2014: 87) und folgen bekannten Mustern, wodurch das Gehirn effizienter Erfahrungen abruft und bewertet (Herbst, 2011: 26–29). Wegen der Vorteile nutzen Unternehmen Storytelling vielseitig, um neue Produkte, Konzepte oder Organisationen zu werben (Frenzel et al., 2006: 224).

Tabelle 1: Geschichtselemente verschiedener Autoren

Autoren	Elemente einer Geschichte
Fog et al., 2005	• Botschaft (S.32) • Konflikt (S.32-35) • Charaktere (S.36-41) • Handlung (S.42-43)
Frenzel et al., 2006	• Protagonist/ Held (S.88) • Weitere Rollen (S.88) • Botschaft (S.64) • Ausgangszustand, Transformation, Endzustand (S.76-77) • Konflikt (S.82-87)
Herbst, 2011	• Handelnde (S.93) • Handlung (S.106) • Handlungselemente Konflikt (108-109), Alternativen, Plot-Point und Wandel (S.108-112) • Ort/ Bühne (S.117)

Krüger, 2015	• Akteure (S.82)
	• Ereignisse (S.82)
	• Ort (S.82)
	• Zeit (S.82)
	• zeitliche und kausale Ereignisfolge (S.79)
Scholes, 1980	• Menschen oder ähnliche Wesen, sonst Vermenschlichung (S.210)
	• Geschichts-Form:
	• Anfang-Mitte-Ende oder Situation-Transformation-Situation (S.210)
Weber, 2017	• Inhalt (Rahmen der Ereignisse) (S.12)
	• Protagonisten (S.12)
	• Verlauf (S.12)
	• Ergebnis (S.12)

Quelle: Eigene Darstellung

Aus den Elementen einer Geschichte laut verschiedener Autoren (vgl. Tabelle 1) lassen sich folgende Kernelemente für diese Arbeit zusammenfassen:

Das erste Kernelement ist die Charaktere, bestehend aus den Hauptcharakteren und möglicherweise weiteren Nebencharakteren (auch Protagonist, Held, Akteur, Handelnder und/ oder weitere Rollen genannt). Dabei handelt es sich um Menschen, Tiere oder Dinge, welche menschliche Eigenschaften besitzen (Frenzel et al., 2006: 88; Scholes, 1980: 210). Damit sich die Zielgruppe mit den Charakteren identifizieren kann, muss einer der Charaktere, bestenfalls der Held, Ähnlichkeit mit ihnen aufweisen (Fog et al., 2005: 39; Frenzel et al., 2006: 88).

Dem Kernelement Ereignisabfolge (auch Verlauf, Form, Handlung) wird meist eine dreigeteilte Struktur zugeschrieben, z.B. Anfang, Mitte, Ende (vgl. Tabelle 1). Ereignisse sind kleinste Einheiten einer Geschichte, welche räumlich und zeitlich abgrenzbar sind (Krüger, 2015: 86), chronologisch und kausal geordnet sein müssen (Krüger, 2015: 79; Woodside et al., 2008: 101) und einen Konflikt enthalten. Dieser ist in einer Geschichte die treibende Kraft ist, die Harmonie zerstört und dadurch für Spannung sorgt (Fog et al., 2005: 33–34).

Fog et al. (2005) und Frenzel et al. (2006) benennen die Botschaft als Element. Sie ist die Kernaussage, die nicht einfach erklärt, sondern durch eine Geschichte vermittelt wird, um besser verstanden zu werden, z.B. als Moral der Geschichte (Fog et al., 2005: 32; Frenzel et al., 2006: 70).

2.3. C2C-Kommunikation

2.3.1. Anforderungen CSR-Kommunikation

Das Feld der C2C-Kommunikation ist wenig erforscht, weshalb Literatur zur CSR-Kommunikation (Corporate Social Responsibility) als Vergleichswert hinzugezogen wird.

Transparenz ist in der CSR-Kommunikation wichtig (Faber-Wiener, 2015: 762; Huber, 2015: 798), fördert Verantwortung in der Textilindustrie (Bergmann, 2018: 280) und wird von Konsumenten erwartet (Fifka, 2018: 148; Heinrich & Schmidpeter, 2018: 6).

Damit die CSR-Botschaft glaubwürdig ist (Faber-Wiener, 2015: 753; Huber, 2015: 793), muss die kommunizierte Information wahrheitsgemäß und nachprüfbar sein muss (Die Verbraucherinitiative e.V., 2012: 5), ansonsten kann sie als Greenwashing gesehen werden (Heinrich & Schmidpeter, 2018: 7–8).

Komplexe Informationen über CSR-Maßnahmen sollten verständlich, nachvollziehbar (Die Verbraucherinitiative e.V., 2012: 5), aktuell, ganzheitlich, ernsthaft, sachlich (Heinrich & Schmidpeter, 2018: 4–6) und trotzdem nicht einfältig (Walter, 2010: 49) dargestellt sein und den Verbraucher wirklich erreichen (Die Verbraucherinitiative e.V., 2012: 4).

Eine CSR-Kommunikation sollte so ausgerichtet werden, dass sie auf die Ansprüche der Zielgruppe passt (Walter, 2010: 49).

2.3.2. Hürden C2C-Kommunikation

Ein wichtiger Grund, weshalb keine zirkulären Produkte gekauft werden, ist das fehlende Wissen, um informierte Entscheidungen zu treffen (Zylka et al., 2021: 3). In der Bekleidungsindustrie ist das C2C-Konzept noch weitgehend unbekannt (Hemkhaus et al., 2019: 27) und Konsumenten, die an lineare Produkte gewöhnt sind, könnten Schwierigkeiten haben, die Nutzbarkeit, Auswirkungen und Vorteile eines zirkulären Produkts zu verstehen (Zylka et al., 2021: 3). Hürden für den Kauf von kreislauffähigen Produkten, wie Skepsis, Verfügbarkeit, Annehmlichkeiten und Gewohnheit (Hemkhaus et al., 2019: 26–27), müssen durch innovative und umfassende Kommunikation überwunden werden, (Ellen MacArthur Foundation, 2017: 28; Zylka et al., 2021: 4) um

Bewusstsein bei Konsumenten zu schaffen (Gözet & Wilts, 2022: 22), indem durch Kampagnen für C2C geworben wird (Hemkhaus et al., 2019: 29)

2.3.3. Anforderungen C2C-Kommunikation

Dafür werden die Anforderungen an eine C2C-Kommunikation in dem beschriebenen Zusammenhang identifiziert:

Wissensaufbau

Das C2C-Prinzip und die Kreislaufwirtschaft sind noch weitgehend unbekannt (Brinkmann & Willers, 2017: 193; Hemkhaus et al., 2019: 27) oder es liegen Fehlinformationen darüber vor, zum Beispiel wird C2C mit Recycling und schlechter Qualität assoziiert (Hemkhaus et al., 2019: 27) oder nicht als neu angesehen (Henninger et al., 2020: 355). Eine mehrfach genannte Anforderung ist deshalb der Aufbau von Wissen über das C2C-Prinzip (Brinkmann & Willers, 2017: 191; Han et al., 2017: 139; Hemkhaus et al., 2019: 29; Henninger et al., 2020: 356).

Zertifizierung

Die C2C-Zertifizierung kann dem Konsumenten den Produktvergleich erleichtern (Zylka et al., 2021: 10) macht die Kommunikation transparent (Zylka et al., 2021: 6), Unternehmensaussagen nachprüfbar und erhöht die Authentizität und Glaubwürdigkeit. Deshalb sollte sie in der C2C-Kommunikation präsenter genutzt werden (Brinkmann & Willers, 2017: 192–194) und ist laut dort Zylka et al. (2021) sogar notwendig, um Konsumenten zu dem Kauf von kreislauffähigen Produkten zu bewegen (Zylka et al., 2021: 6).

Jedoch gibt es viele Eigenmarken- und Öko-Zertifizierungen, was zu Verwirrung und Bewertungsschwierigkeiten führen kann (Rossi & Rivetti, 2023: 2).

Modisch

Konsumenten achten im Kaufentscheidungsprozess zuerst auf den Stil und Preis der Bekleidung (Bucklow et al., 2017: 57; Han et al., 2017: 141).

Laut Befragten aus der nachhaltigen Mode können Konsumenten einfacher für Upcycled-Fashion gewonnen werden, wenn in der Kommunikation erst auf Design und Stil, danach auf Nachhaltigkeit, Herkunft und Pflege eingegangen wird (Han et al., 2017: 139), weshalb modischen Eigenschaften von zirkulärer Bekleidung hervorgehoben werden sollten (Hemkhaus et al., 2019: 30).

Zielgruppenorientierung

Konsumenten sind mit Werbung überflutet und beachten nur für sie relevanten Nachrichten (Han et al., 2017: 127), weshalb die wirksamste Übermittlungsart der Zielgruppe identifiziert (Han et al., 2017: 140) und nicht zu viele Informationen genannt werden sollte (Hemkhaus et al., 2019: 30).

Eine effektive Kommunikation von zirkulärer Kleidung ist verständlich (Han et al., 2017: 134), kurz, visuell (Han et al., 2017: 139–141), klar, hat eine emotionale und kreative Botschaft (Brinkmann & Willers, 2017: 192), pflegt die Unternehmer-Konsumenten Beziehungen und ermutigt verantwortungsbewusste Konsumentenentscheidungen (Han et al., 2017: 141).

Obwohl gerade die junge Zielgruppe oft neue Kleidung kauft (Rückert-John et al., 2021: 50), ist sie offen „für neue, alternative Praktiken, auch für nachhaltigen Konsum" (Rückert-John et al., 2021: 44–45) und wird durch eine attraktive, zeitgemäße und humorvolle Kommunikation erreicht, in welcher Influencer helfen (Rückert-John et al., 2021: 46).

Die Anforderungen der CSR-Kommunikation unterscheidet sich teilweise von der C2C-Kommunikation, auch aufgrund der Produktnähe. Deshalb müssen einheitliche und klare Anforderungen an die C2C-Kommunikation etabliert werden:

UF1: Welche Anforderungen werden an die Kommunikation von C2C-Produkten gestellt?

2.4. Storytelling für Cradle to Cradle

2.4.1. Storytelling für CSR

Storytelling wird wenig in der CSR-Kommunikation genutzt (Baraibar-Diez et al., 2017: 210) und es gibt wenig Forschung in dem Zusammenhang (Pérez et al., 2020, 16).

Ein Grund könnte die in Abschnitt 2.3.1. beschrieben Anforderung "Glaubwürdigkeit" und damit eine nicht ernsthafte CSR-Kommunikation sein, die als Greenwashing gesehen wird (Heinrich & Schmidpeter, 2018: 6).

Bestätigend fand Clementson (2020) heraus, dass nicht narrative (vs. ethisch narrative vs. unethisch narrative) Nachrichten in der Krisenkommunikation am vertrauenswürdigsten sind. Dem entgegen fanden aber Xu & Kochigina (2021) heraus, dass Skepsis durch narrative (vs. nicht narrative) Videos sinkt und Boukes & LaMarre (2021) fanden heraus, dass CSR-Botschaften, welche sich Narrativen bedienen, indirekt die Konsumenten-Einstellung gegenüber dem Unternehmen verbessern und die Glaubwürdigkeit der Botschaft trotzdem nicht beeinträchtigen.

Die Literatur unterscheidet sich demnach. Frenzel et al. (2006) empfiehlt authentische Geschichten mit einem realen Hintergrund anstatt fiktiver Geschichten für Storytelling in Unternehmen, da sie für den Zuhörer überprüfbarer und glaubwürdiger sind (Frenzel et al., 2006: 36–37).

In der CSR-Kommunikation wird bereits Social-Campaigning mit Instrumenten der klassischen Werbung genutzt, um Bewusstsein für Unternehmensaktivitäten zu schaffen (Walter, 2010: 109). Die Gefahr von Greenwashing ist aber gegeben (Faber-Wiener, 2013: 102), da klassische Werbeinstrumente manipulativ wirken könnte (Walter, 2010: 107).

2.4.2. Storytelling für C2C in der Bekleidungsindustrie

Werkzeuge der klassischen Werbung könnten auch für die C2C-Kommunikation von Bekleidung genutzt werden. Es könnten einzigartige Unternehmensgeschichten erzählt werden, welche Individualität und Verantwortung spiegeln (Moisio, 2018: 126). Calvo-Porral & Lévy-Mangin (2020) fanden heraus, dass das positive Image der wichtigste Faktor für Konsumenten ist und empfehlen Kommunikationskampagnen mit konsumentengerechten Informationen über recycelte Produkte und deren Eigenschaften zur Sensibilisierung und Aufklärung über den Verbrauch von Kreislaufprodukten (Calvo-Porral & Lévy-Mangin, 2020: 10). Auch Hemkhaus et al. (2019) schlagen für den Wissensaufbau von C2C Konsumenten-Kampagnen vor (Hemkhaus et al., 2019: 29).

Storytelling könnte gerade bei jungen Fast-Fashion Konsumenten mit wenig Zeit und ständiger Medienpräsenz (Rückert-John et al., 2021: 46), die in Abschnitt 2.2. beschriebene komplexreduzierende und gut merkbare Wirkung von Vorteil sein. Damit ein Produkt durch eine Storytelling-Werbung keine reine Unterhaltung ist, sondern wirksam überzeugt, muss eine sinnvolle Verbindung zwischen dem Produkt und der Geschichte hergestellt werden (Glaser & Reisinger, 2022: 188). Auch fanden Kim et al. (2022) heraus, dass die Glaubwürdigkeit grüner Werbung bei einem narrativen (vs. nicht narrativen) Stil und bei spezifischen (vs. nicht spezifischen) Aussagen über die grüne Initiative höher ist. In Zusammenhang mit C2C gibt es auch hier keine Forschung. Deshalb lautet die zweite untergeordnete Fragestellung:

UF2: Wie können die Anforderungen an eine C2C-Kommunikation mit Storytelling umgesetzt werden?

In Abschnitt 2.2. wurden drei Hauptelemente einer Geschichte identifiziert. Charaktere, mit denen sich der Zuhörer identifizieren kann, können an die Zielgruppe angelehnt sein (Frenzel et al., 2006: 89), welche schon im einleitenden Teil des 2. Kapitels beschrieben wurde. Deshalb muss diesem Element keine genauere Betrachtung geschenkt werden. Jedoch ist fraglich, ob aus dem weitgreifenden C2C-Konzept ein einzelner Konflikt und eine einzelne Kernbotschaft herausgearbeitet werden kann und wie diese lautet.

UF3: Wie kann das C2C-Konzept in dem Format einer Geschichte kommuniziert werden?

3. QUALITATIVE FORSCHUNG

Um die Forschungsfrage zu beantworten, wurde eine qualitative Studie durchgeführt.

3.1. Datenerhebung

Die Methode ist das halbstandardisiertes und leitfadengestütztes Interview (Hussy et al., 2013: 224–225) mit Experten. Experten verfügen über „besonderes Wissen" (Gläser & Laudel, 2010: 11) welches „in besonderem Ausmaß praxiswirksam wird" (Bogner et al., 2014: 13). Für den qualitativen Stichprobenplan wurde die bewusste Stichprobenziehung nach der Top-Down Meth-

ode gewählt. Die Kriterien für die Stichprobenziehung wurden vorab festgelegt. Um die gesamte Variabilität des Forschungsbereichs abzubilden, wird die Stichprobe heterogen zusammengesetzt (Hussy et al., 2013: 193–195).

Personen mit den folgenden Kriterien (mindestens eines) kamen als Experten in Frage:

- Erfahrung mit C2C
- Erfahrung mit Storytelling
- Erfahrung in der Nachhaltigkeitskommunikation /-marketing
- Erfahrung in der nachhaltigen Bekleidungsbranche

5 Experten mit Erfahrungen im Nachhaltigkeitsbereich und Marketingbereich, wurden gewonnen (Vgl. Tabelle 2).

Tabelle 2: Stichprobenplan

Position	Unternehmen	Kriterium	Experten
Founder/ Executive Producer Media Manager	Kommunikations- und Media Agentur mit Schwerpunkt auf Nachhaltigkeit und Storytelling Für C2C-Zertifizierungen beratendes Unternehmen	• C2C • Storytelling • Nachhaltigkeitskommunikation	E1
Director Change & Transformation Communications Consultant Dozent für Kampagnen und Storytelling	Management Consulting Freelance für CSR, Nachhaltigkeit und Kommunikation Hochschule	• Nachhaltigkeitskommunikation • Storytelling	E2
Senior Marketing-Manager Mitglied	Personalvermittlung Organisation im C2C-Bereich	• Marketing • Storytelling • C2C	E3
Nachhaltigkeits-kommunikation	Bekleidungsunternehmen spezialisiert auf Arbeitskleidung mit C2C zertifizierter Kollektion	• C2C • Nachhaltigkeitskommunikation • Nachhaltige Bekleidungsbranche, (B2B) • Storytellling	E4
Geschäftsführer	Markenkommunikation und Unternehmensentwicklung mit Schwerpunkt Nachhaltigkeit und Transformation	• Nachhaltigkeitskommunikation	E5
Gesamtzahl der Experteninterviews			**N=5**

Quelle: Eigene Darstellung

Der Interviewleitfaden besteht aus 14 Fragen, welche thematisch in vier Themenblöcke geteilt sind (Einleitung, C2C, Storytelling für C2C, Schluss) und aufgrund der erarbeiteten Theorie entwickelt wurden. Ad-Hoc Fragen wurden gestellt, und sind aus den Transkripten herauszulesen (Hussy et al., 2013: 229).

3.2. Datenaufbereitung

Daten wurden generiert, aufbereitet und ausgewertet (Hussy et al., 2013: 222), verbal über Zoom erhoben, vollständig in Schriftdeutsch transkribiert und auf Fehler geprüft. Unternehmensnamen oder Personennamen wurden anonymisiert. Der Text wurde für die bessere Lesbarkeit und das Verständnis grammatikalisch korrekt gestaltet, Wortwiederholungen oder abgebrochene Wörter wurden ignoriert. Die Interpretation des Forschenden bestimmt, welche Satzzeichen weg- oder hinzukommen und wie der Satz für die beste Lesbarkeit grammatikalisch gebildet wird (Hussy et al., 2013: 245–248).

3.3. Datenauswertung

Für die Auswertung eines Leitfadeninterviews ist die Inhaltsanalyse geeignet (Hussy et al., 2013: 227), weshalb auf Grundlage der qualitativen Inhaltsanalyse nach Mayring (2022) durch die induktive Zusammenfassung ausgewertet wurde (Mayring, 2022: 66). Für die Kategorienbildung (Mayring, 2022: 84–86) wurde ein Kodierleitfaden anhand der Literatur entwickelt und anhand des Interviewmaterials mehrmals angepasst. Dadurch ergaben sich fünf Hauptkategorien mit jeweils 2-6 Unterkategorien, welche aus einer sowohl deduktiven als auch induktiven Mischform gewonnen wurden.

3.4. Ergebnisse

Anhand eines Kodierleitfadens wurden die Ergebnisse in Kategorien und Unterkategorien geteilt.

Bei Kategorie 1 handelt es sich um die Anforderungen C2C-Kommunikation, die Antworten der Experten bilden die Unterkategorien.

Darauf aufbauend wurde die Experten nach der Eignung von Storytelling für die jeweilige Anforderung befragt. Kategorie 2 beinhaltet diese Möglichkeiten des Storytellings für die jeweilige C2C-Anforderung.

Da K2 auf K1 aufbaut, ist ein direkter Bezug gegeben, weshalb für die Auswertung die Ergebnisse der jeweiligen Unterkategorien vergleichend gegenübergestellt wurden und wenn möglich, in Abschnitten geordnet wurden.

Kategorie 3 des Kodierleitfadens thematisiert die Kommunikation der Zertifizierung des C2C-Konzepts. Um zu erfahren, ob und wie intensiv die Zertifizierung kommuniziert werden soll, wurde zwei Unterkategorien gebildet: Gründe für und gegen die Kommunikation der Zertifizierung.

Um zu erfahren, wie C2C durch eine Geschichte kommuniziert werden kann, wurden für Kategorie 4 „C2C im Geschichtenformat" die Unterkategorien 4.1. Botschaft und 4.2. Konflikt einer C2C-Geschichte gebildet.

In Kategorie 5 sind zusätzliche Vorteile und Risiken für den Einsatz von Storytelling in der Kommunikation von C2C-Produkten in der Bekleidungsindustrie aufgeführt.

4. AUSWERTUNG UND DISKUSSION

4.1. UF1: Welche Anforderungen werden an die Kommunikation von C2C-Produkten gestellt?

Wissensaufbau

Alle Experten sind sich einig, dass in der Kommunikation für C2C ein Wissensaufbau (K1.1.) stattfinden muss (E1, E2, E3, E4, E5) und eine Aufklärung über den Mehrwert für die Welt stattfinden sollte (E5). Dabei darf der Wissensaufbau nicht belehrend sein (E1, E5), sondern Emotionalität ist die bessere Möglichkeit, Menschen zu erreichen und Wissen aufzubauen als Vernunft, Moral oder Intellekt (E1).

Bezüglich der Komplexität des Wissens, das vermittelt werden soll, bestehen geteilte Meinungen. So soll einerseits „die Komplexität der neuen gesellschaftlichen Idee" (E1), „alle Perspektiven" (E3) und Faktoren (E3) für ein ganzheitliches Bild (E3) mit Informationen zu den unterschiedlichen Kreisläufen und dem Produktumgang (E4) vermittelt werden

Andererseits sollte laut der Literatur (vgl. Abschnitt 2.3.3.) eine Überforderung des Konsumenten vermieden werden, indem nicht zu viele und verständliche Informationen über negative Umweltauswirkungen der Fast-Fashion kom-

muniziert werden. E1 bestätigt, dass die Informationen nicht überhandnehmen dürfen, weswegen man sich auf „ein paar schöne Kernaussagen" (E1) fokussieren sollte. Jedoch führt die Komplexität von C2C oft zu „einem unglaublich komplexen Erklärbär-Film" (E1) und Menschen brauchen lange, um es zu verstehen. E3 stuft die ganzheitliche Wissensdarstellung in der Kommunikation von C2C als schwierig, aber wichtig ein (E3).

Komplexitätsreduktion

Auch wenn Uneinigkeiten über die Intensität des Wissensaufbaus in der Kommunikation gibt, wird vermehrt auf einen komplexitätsreduzierenden Wissensaufbau hingewiesen (vgl. Abschnitt 2.3.3., E1, E4, E5). Deshalb ist die Komplexitätsreduktion (K1.6.) eine Anforderung an die C2C-Kommunikation, obwohl sich die komplexreduzierende Wissensvermittlung als schwierig herausstellt (E5). Diese kann durch das Kürzen oder Simplifizieren von Informationen (E4), durch weniger Hintergrundinformationen oder durch die Reduktion auf Kernaussagen (E1) erfolgen, der Mehrwert muss aber immer kommuniziert werden (E4).

Stakeholderorientierung

Die befragten Experten nannten die Stakeholderorientierung als wichtige Anforderung (K1.2.) (E1, E2, E3, E5). In Abschnitt 2.3.3. wurde die konsumentengerechte Darstellung als verständliche, kurze, emotionalisierte und kreative Kommunikation benannt. E1 stimmt zu, dass die Kommunikation für die breite Masse attraktiv bleiben muss und für die Zielgruppe ohne viel Vorwissen kann durch häufige und humorvolle Kommunikation Attraktivität erzeugt werden (E1). Trotzdem sollte die genaue Zielgruppe des Produkts definiert werden (E3, E5) und der Wissensstand der Zielgruppe herausgefunden werden (E5), da bei der Komplexität von C2C die zielgruppenspezifische Kommunikation schwer ist (E3)

Obwohl die junge Zielgruppe schon durch Themen wie „Fridays for Future" sensibilisiert ist, steht Nachhaltigkeit beim Bekleidungskauf nicht an erster Stelle und es ist schwer, sie zu erreichen und vom Fast-Fashion Trend abzubringen (E2). Deshalb muss die Kommunikation an die Tonalität und Aufmerksamkeitsspanne der jungen Zielgruppe angepasst werden (E3), indem

C2C „cool" kommuniziert wird (E2) und Gamification (E3) oder Influencer (E2) genutzt werden. Auch die Literatur empfiehlt für junge Fast-Fashion Konsumenten mit schnelllebigem Alltag und ständiger Medienpräsenz eine attraktive, humorvolle und zeitgemäße Kommunikation (vgl. Abschnitt 2.3.3.). Im Vergleich zu der CSR-Kommunikation (vgl. Abschnitt 2.3.1.) liegt der Fokus der C2C-Kommunikation mehr auf einer werbenden Kommunikation in der Stakeholderorientierung.

Emotionalität

Eine weitere Anforderung ist die Emotionalisierung (K1.3.). C2C sollte visuell (E4) und emotional kommuniziert werden (E1, E2, E4), um Konsumenten besser zu erreichen und mehr Konsumenten zu erreichen (E1), damit sie eine bessere Beziehung zu dem C2C-Konzept aufbauen (E2). Auch die Literatur sieht eine emotionale und kreative Kommunikation in ansprechender visueller Form sein vor (vgl. Abschnitt 2.3.3).

Glaubwürdigkeit

Die Literatur bietet kaum Informationen zur Glaubwürdigkeit für eine C2C-Kommunikation, außer, dass eine Zertifizierung für mehr Authentizität und Glaubwürdigkeit sorgt (vgl. Abschnitt 2.3.3). In der CSR-Kommunikation ist die Glaubwürdigkeit aber eine wichtige Anforderung, weshalb Experten danach befragt wurden, wenn sie die Glaubwürdigkeit nicht bereits als Anforderung für die C2C-Kommunikation genannt haben. Alle Experten sagen, dass C2C glaubwürdig kommuniziert werden muss (E1, E2, E3, E4, E5). E1, E3 und E5 haben die Glaubwürdigkeit selbstständig angesprochen, E2 und E3 haben auf Nachfrage die Glaubwürdigkeit auch als Anforderung benannt. Ein wichtiges Merkmal, das genannt wurde, um glaubwürdig zu sein bzw. zu wirken, ist die Transparenz der Unternehmen (E1, E2).

Transparenz

Die Transparenz wurde in Bezug auf die C2C-Kommunikation nicht in der Literatur genannt. Experten 1, 2 und 3 betonen jedoch ihre Notwendigkeit in der C2C-Kommunikation. Eine Möglichkeit für Transparenz ist die

Zertifizierung (E3). Dabei sollte nicht nur das C2C-Prinzip bezogen auf das Produkt und die Wertschöpfungskette transparent kommuniziert werden (E1, E2). Sondern das Unternehmen sollte auch offenlegen, wenn es sich noch auf dem Weg zu einem reinen C2C-Produzenten befindet (E1, E3) oder wenn eine komplette C2C-Produktion nicht möglich ist (E3). Wenn ein Unternehmen, all diese Informationen transparent für Konsumenten zugänglich macht, erfüllt es auch die Anforderung der Glaubwürdigkeit (E2).

Zertifizierung

Die Kommunikation der Zertifizierung ist wichtig (E2, E3, E5), besonders für den Vertrauensaufbau (E5) und die Möglichkeit der weiteren Nachprüfbarkeit von Informationen (E3).

Jedoch bestätigen einige Experten den in Abschnitt 2.3.3 aufgeführten Grund gegen eine Kommunikation der Zertifizierung: die Überzertifizierung (E2, E3, E5), welche zu geringerer Glaubwürdigkeit (E2), Verwirrung (E5) und Abstumpfung (E3) gegenüber der C2C-Zertifizierung führen könnte. Zusätzlich spricht gegen die Kommunikation der C2C-Zertifizierung, dass diese selbst sehr komplex zu verstehen ist, wodurch Konsumenten Probleme haben könnten, den Inhalt und den Unterschied zu anderen Zertifizierungen zu verstehen (E3, E4).

Um diese negativen Auswirkungen einer Kommunikation der C2C-Zertifizierung zu vermeiden, die positiven aber trotzdem zu gewährleisten, könnte die Zertifizierung nicht zentral in der Kommunikation aufgenommen werden, jedoch trotzdem genannt (E2) bzw. durch das Logo abgebildet werden, solange die Möglichkeit für weitere Informationen gegeben wird (E3).

Die in der Theorie genannten Anforderungen werden größtenteils bestätigt. Die Konsumenten-Unternehmer Beziehung (vgl. Abschnitt 2.3.3.) wird nicht thematisiert und wenig Aufmerksamkeit wird den Produkteigenschaften geschenkt. Experte 1 empfiehlt langlebige, neutralere Fashion zu nutzen, geht jedoch nicht auf die Kommunikation dieser Eigenschaften ein.

Sieben Anforderungen für eine C2C-Kommunikation wurden identifizieren (vgl. Abbildung 1)

Abbildung 1: Anforderungen C2C-Kommunikation
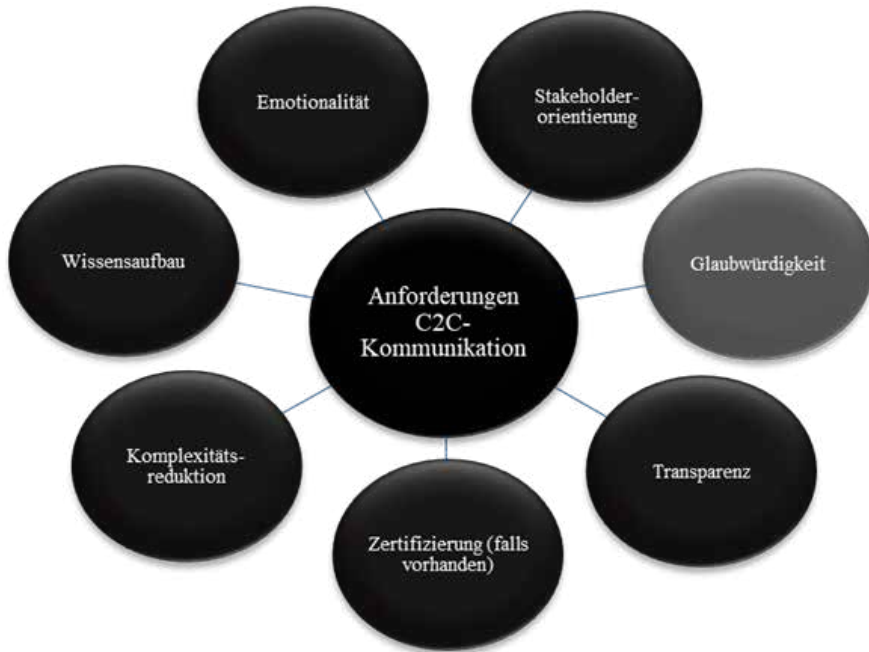
Quelle: Eigene Darstellung

Angelehnt an die Leitlinien für verbrauchergerechte CSR-Kommunikation (Die Verbraucherinitiative e.V., 2012: 5) können die in dieser Arbeit identifizierten Anforderungen einen Ansatz für Leitlinien einer verbrauchergerechten C2C-Kommunikation bieten:

1. C2C-Kommunikation vermittelt Wissen auf eine nicht belehrende, sondern emotionale Art.
2. In der C2C-Kommunikation muss eine Aufklärung und ein Wissensaufbau über das C2C-Prinzip stattfinden. Der Wissensaufbau muss komplexitätsreduzierend durch das Kürzen oder Simplifizieren von Informationen, weniger Hintergrundinformationen oder durch die Reduktion auf Kernaussagen und Kernaspekte erfolgen.
3. Durch die C2C-Kommunikation wird der Mehrwert für die Umwelt kommuniziert, indem Kernaussagen wie die Ressourcenschonung genutzt werden.
4. Um das Interesse der Konsumenten zu wecken, sollte für die Kommunikation die genaue Zielgruppe sowie deren Verständnis von C2C iden-

tifiziert werden, damit die Kommunikation entsprechend abgestimmt werden kann.

5. Die C2C-Kommunikation passt sich der Tonalität der Konsumenten an und kann dadurch auch werbende Kommunikation sein, indem sie zum Beispiel Humor integriert oder Influencer nutzt.

6. Die C2C-Kommunikation ist glaubwürdig, indem sie transparent und einfach zugänglich die zusätzlichen, ausführlichen und wenn möglich, nachprüfbaren Informationen über die Wertschöpfungskette der Produkte den Konsumenten zur Verfügung stellt. Auch zeigt das Unternehmen transparent, wenn es sich noch auf dem Weg befindet, komplett nach dem C2C-Prinzip zu produzieren.

7. Die C2C-Zertifizierung wird, wenn vorhanden, abgebildet. Auch hierzu werden transparent und einfach zugänglich die zusätzlichen, ausführlichen und, wenn möglich, nachprüfbaren Informationen der jeweiligen Zertifizierungsstufe dem Konsumenten zur Verfügung gestellt.

4.2. UF2: Wie können Anforderungen an eine C2C Kommunikation mit Storytelling umgesetzt werden?

Für die Beantwortung werden die Möglichkeiten von Storytelling für die in UF1 identifizierten Anforderungen betrachtet.

Wissensaufbau

Storytelling erhöht das Verständnis und die Merkbarkeit von Fakten, reduziert Komplexität und stellt sie gleichzeitig dar (vgl. Abschnitt 2.3.3). E3 bestätigt, dass C2C-Fakten schwer merkbar sind, weshalb sich Storytelling besser für den Wissensaufbau von Verbrauchern eignet als trockene Fakten (E3). Denn Storytelling lenkt den Fokus der Konsumenten auf C2C, platziert Informationen (E2), und vermittelt komplexitätsreduzierendes und gut merkbares Wissen, welches im Kopf der Konsumenten in Bilder übersetzt wird (E5). Gerade in der momentanen gesellschaftlichen Dauerkrise kann Storytelling eine sehr gute Methode sein, um C2C auf nicht belehrende Art zu kommunizieren (E2), was in der C2C-Kommunikation von Vorteil ist (E1, E5).

Nur Experte 4 findet das C2C-Prinzip zu komplex für einen umfassenden Wissensaufbau durch Storytelling, auch, weil Geschichten ohne viele Fakten

interessanter sind. Es kann aber für eine erste Awareness, ein erstes Interesse und einen grundlegenden Wissensaufbau eingesetzt werden (E4), was ein Vorteil ist, da fehlendes Bewusstsein und Interesse für C2C Hindernisse sind (vgl. Abschnitt 2.3.2.) E1 empfiehlt, sich dabei auf Kernaussagen zu konzentrieren (E1).

Storytelling wird zusammengefasst in der Theorie und Praxis als geeignete Methode für einen komplexreduzierenden Wissensaufbau in der Kommunikation gesehen, vor allem für eine erste Awareness.

Komplexität

Durch Storytelling kann das C2C-Prinzip komplexitätsreduzierend kommuniziert werden, indem nah am Menschen, mit „schönen" Kernaussagen (E1), einer schönen „Kernstory" oder einer Heldengeschichte kommuniziert wird, welche Konsumenten abholt (E5). Laut der Experten ist Storytelling eine geeignete Methode, um das C2C-Wissen komplexitätsreduzierend zu kommunizieren und bestätigt die Theorie (vgl. Abschnitt 2.2).

Stakeholderorientierung

Die Heldenreise ist allen Generationen bekannt, Konsumenten identifizieren sich mit dem Helden und sehen zu ihm auf, weshalb Storytelling für die C2C-Kommunikation an alle Generationen geeignet ist (E3). Eine erste Awareness und ein erstes Interesse kann durch Storytelling bei Fast-Fashion Konsumenten geschaffen werden (E4), wenn die Geschichte gut ist (E3).

Eine Geschichte kann dabei auch auf Bedürfnisse einer Zielgruppe gebaut werden (E5). Erste identifizierte Zusammenhänge zwischen Storytelling und C2C für eine Kommunikation an junge Konsumenten (Abschnitt 2.4.2.), wie die komplexreduzierende, emotionale und leicht verständliche Kommunikation bestätigt E3. Denn für diese Zielgruppe mit geringer Aufmerksamkeitsspanne kann Storytelling geeignet sein, um in „derselben Tonalität" (E3) zu kommunizieren und C2C-Produkte „cool" zu kommuniziert (E2, E3), wodurch C2C-Bekleidung mit Werbung der Fast-Fashion mithalten kann (E3). Bei diesen können auch Influencer oder Gamification in Storys genutzt werden (E2).

E2 nennt einen langfristigen Beziehungsaufbau (vgl. Abschnitt 2.3.3.) als Vorteil von Storytelling für C2C.

Emotionalität

Durch Storytelling kann der Konsument für das C2C-Produkt moralisierend und emotionalisierend abgeholt werden (E4), indem durch Storytelling auch emotional für dieses Produkt geworben wird (E3).

Glaubwürdigkeit

Die Literatur ist sich nicht einig, ob Storytelling CSR-Botschaften glaubwürdig an Konsumenten kommunizieren kann (Vgl. 2.4.1.) und in Bezug auf C2C-Produkte gibt es keine Forschung.

Laut Experten 2, 3 und 4 kann C2C mit Storytelling durch eine transparente Informationsdarstellung glaubwürdig kommuniziert werden und mindert Skepsis (E3) und vermeidet Greenwashing Vorwürfe (E4). Zum Beispiel, mit Verweis auf weitere nachlesbare Informationen (E3, E4) oder das Zertifikat (E3). Das Produkt bzw. das Unternehmen sollte auch selbst schon glaubwürdig sein (E5).

Laut Frenzel et al. (2006) ist eine Geschichte glaubwürdiger, wenn sie einen realen Hintergrund hat und authentisch ist. Auch für E3 sollte Storytelling für C2C eine seriöse Komponente in Form von Fakten innehaben. E2 widerspricht dem und ist der Meinung, dass eine Geschichte über C2C sowohl authentisch als auch fiktiv sein kann. Er nennt Glaubwürdigkeit als einen Vorteil, der aus der Nutzung von Storytelling für C2C hervorgeht (E2).

Laut der Experten ist Storytelling demnach kein Risiko für die Glaubwürdigkeit von C2C in der Kommunikation, wenn das Wissen und die Fakten transparent durch nachlesbare Informationen vermittelt werden und das Produkt bzw. das Unternehmen selbst schon glaubwürdig sind.

Transparenz

Wenn die Fakten von C2C subtil vermittelt werden, kann C2C glaubwürdig und transparent durch Storytelling kommuniziert werden (E2). Dabei muss

das Unternehmen transparent den eigenen Weg und nicht nur das Ziel in der Geschichte darstellen (E2) Auch in einer aufmerksamkeitsgenerierenden Geschichte können die Informationen über das Produkt seriös und transparent kommuniziert werden, z.B. über das Zertifikat (E3).

4.3. UF3: Wie kann das C2C-Konzept in dem Format einer Geschichte kommuniziert werden?

In Abschnitt 2.2. wurden drei Hauptelementen einer Geschichte identifiziert: 1) Charaktere 2) eine Ereignisabfolge mit Konflikt und eine 3) Botschaft.

Da alle Generationen mit der Heldenreise vertraut sind und sich mit dem Helden, als welcher der Konsument selbst eingesetzt werden kann (E3), identifizieren können, ist Storytelling ein geeigneter Ansatz, um C2C effektiv zu vermitteln (E3). Da Influencer „wahnsinnige Macht" über junge Konsumenten haben, sollten sie für die Charaktere eingesetzt werden (E2).

Ein Konflikt zu C2C kann in einer Geschichte kommuniziert werden (E1, E2, E3. E4, E5). Die Modebranche muss aber abwägen, wie weit sie im Konflikt zeigen möchte, dass sie selbst Teil des Umweltproblems ist (E1). Die Experten fokussieren sich auf drei Aspekte des C2C-Konflikts: Umweltauswirkungen, Glaubwürdigkeit und Mensch. Unter „Umweltauswirkungen" wird Klimawandel, Umweltverschmutzung, Emissionen (E2), Ressourcenknappheit (E4), Abfall (E2) und gesundheitsgefährdenden Chemikalien in Bekleidung (E4) welche durch C2C gelöste werden könnten, genannt.

Der Konflikt mit dem Fokus Glaubwürdigkeit und Transparenz könnte das Unternehmen, welches das Vertrauen der Konsumenten zurückgewinnen muss (E3), thematisieren z.B. indem Konflikte in der Wertschöpfungskette aufgezeigt werden (E2).

Der Mensch kann konfliktlösender Held im Mittelpunkt stehen (E3), z.B. indem er verdeutlicht, was der Kauf für oder gegen C2C-Bekleidung bewirkt (E5).

Die Bildung einer zentralen Botschaft von C2C ist schwer, da das Konzept komplex ist (E1), weshalb die Experten oft auf Kernaussagen zurückgreifen:

- C2C bietet eine glaubwürdige, bereits bestehende (E3) Alternative zu dem klassische Wachstumsmodell (E1), welche bereits transparent zer-

tifizierte C2C-Produkte hervorbringt, durch welche der Konsument seinen Beitrag leisten kann (E3).

* Kein Abfall (E1, E3), keine Ressourcenknappheit durch biologische Abbaubarkeit (E1, E2, E3, E4), keine Zerstörung des Klimas (E2). Der Impact von C2C muss als Botschaft kommuniziert werden (E1).

* Die Botschaft sollte nah am menschlichen Bedürfnis und einfach sein. Beispiele für das Bedürfnis sind eine gesunde Gesellschaft und Artenvielfalt, ein gesunder Planet, ein stabiles Klima (E1) und gesunde Bekleidung (E5).

5. LIMITATIONEN UND FAZIT

5.1. Limitationen

Das untersuchte Feld wurde bisher weder in der Theorie noch in der Praxis erforscht oder praktiziert, weshalb Experten aufgrund ihres Wissens in Teilbereichen gewählt wurden und ein Expertenwissen in dem gesamten konkreten Zusammenhang gefehlt hat.

Aufgrund der heterogenen Experten sind die erhobenen Daten nicht komplett vergleichbar, sondern bieten erste Erkenntnisse über das erforschte Feld.

5.2. Fazit und Handlungsempfehlungen

Es wurden Anforderungen für eine verbrauchergerechte C2C-Kommunikation erarbeitet und die Eignung von Storytelling zur Kommunikation von C2C-Bekleidung anhand dieser Anforderungen untersucht.

Basierend auf sieben identifizierten Anforderungen und unter Berücksichtigung der Leitlinien für verbrauchergerechte CSR-Kommunikation (Die Verbraucherinitiative e.V., 2012: 5) wurde ein Ansatz für Leitlinien einer verbrauchergerechten C2C-Kommunikation entwickelt.

Es wurde gezeigt, dass Elemente einer Geschichte auf C2C übertragen werden können. Auch eignet sich Storytelling in der C2C-Kommunikation an Konsumenten, um Interesse zu wecken. Gerade für junge Fast-Fashion Konsumenten bietet Storytelling die Möglichkeit, Aufmerksamkeit und ein grundlegendes Bewusstsein für zirkuläre Mode zu schaffen.

Zukünftige Forschung kann die Ergebnisse nutzen, um die C2C-Kommunikation bei Konsumenten zu testen und die Effektivität der C2C-Kommunikation zu verbessern. Dadurch können die identifizierten Leitlinien einer verbrauchergerechten C2C-Kommunikation erweitert werden.

Insbesondere die Wirkung von Storytelling in dem untersuchten Zusammenhang sollte erforscht werden. Dabei können die identifizierten Möglichkeiten einer C2C-Botschaft getestet werden, um herauszufinden, auf welche Botschaften Konsumenten am besten reagieren. Auch können mögliche Geschichtenformate getestet werden, um zu herauszufinden, wie ganzheitlich oder komplexitätsreduzierend das Wissen über C2C durch Storytelling von Konsumenten aufgenommen werden kann.

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COMPARATIVE ANALYSIS OF WORD-OF-MOUTH AND PROMOTION IN HIGHER EDUCATION – INFLUENCE ON STUDENT'S CHOICE OF INSTITUTION

Boris MARJANOVIĆ, Ph.D.
Istarsko veleučilište
– Universtà Istriana di scienze applicate, Pula

E-mail: bmarjanovic@iv.hr

Abstract

Many marketers consider word-of-mouth the most potent form of marketing due to its credibility as a source of information passed on by friends or family members with no vested interests. This is particularly true in the service industry, where service products are intangible. Higher education is no exception, and recent studies have shown the influence of word-of-mouth on prospective students in their choice of institution. While promotional tools are also essential for providing necessary information to prospective students, this study aims to identify the ratio of communication channels used by prospective students, namely word-of-mouth and promotion, during their decision-making process. The study conducted on a sample of 50 students in Croatia indicates that word-of-mouth dominates as an information source in all phases of the student's choice process, except during the information search phase, where technical information is mainly obtained through the institution's website. Although the study has limitations due to its small sample size, future research should aim to determine the significance of individual media's influence on students' higher education choices and their frequency of use to gain a more comprehensive understanding of the communication process in the higher education market. In conclusion, word-of-mouth and promotion complement each other, and the success of communication efforts depends on a smart synergy of all media and channels.

Keywords: *higher education, word-of-mouth, promotion, decision-making phases, student's choice of university*

JEL Classification: *M30*

1. INTRODUCTION

There is a saying that 'a good reputation is heard far and wide,' and it is also said that word-of-mouth is the most powerful influencer on a buyer's purchase decision. However, companies do not have direct control over word-of-mouth (WoM). Companies can only use promotional tools to communicate with their target audiences. To do it successfully, companies use specific combinations of these available tools, like advertising, sales promotions, public relations, direct marketing, and personal selling (Fill & Turnbull, 2016). But what about WoM? If it is such a powerful tool, how can companies use it if it is not under their direct control?

Successful communication implies control over the message 'to ensure that the intended message is shared with and among the target audiences' (Fill & Turnbull, 2016 28). But WoM does not belong to planned communication; therefore, while planned marketing communications carry a high level of control, 'unplanned word-of-mouth conversations carry little control' (Fill & Turnbull, 2016 28). The reason it is not under the control of companies stems from its very definition. WoM is defined as the involvement of 'individuals sharing information with other individuals in verbal form, including face-to-face, phone, and the Internet' (Hawkins & Mothersbaugh, 2009: 238). This type of communication 'can be directed positively (e.g., recommendations) and negatively (e.g., dissuading others from using a certain provider's services)' (Bruhn & Georgi, 2006: 448), and its value of influence often derives from the individual's first-hand experience, knowledge, or opinion, which is regarded 'to be unbiased and trustworthy' (Brassington & Pettitt, 2005: 69).

Therefore, how important is the influence of what a company cannot pay for to achieve, but rather is dependent on how a company behaves? Moreover, if WoM is so powerful, does it mean its promotional efforts are futile? Or should a company still invest in promotion? These questions highlight the need for further investigation into the effectiveness of a company's promotional efforts in the face of the powerful influence of WoM and how this dynamic applies explicitly to the higher education market. Consequently, this research aims to identify the importance and usage of WoM as a nonmarketing source compared to promotional tools used by higher education institutions to communicate with prospective students and influence their decision-making process effectively.

2. LITERATURE REVIEW

2.1. An Overview of the Term 'Word-of-mouth'

According to Kardes et al. (2010: 317), some marketers believe that WoM is 'the most powerful form of marketing—period'. Despite the huge amount spent on promotion, WoM is superior in affecting buyers' purchase decisions, influencing 'up to 50% of all consumer good sales' (Solomon, 2018: 422). However, why is WoM so influential? Schiffman and Wisenblit (2019: 242) argue that WoM 'is one of the most credible forms of buying-related information because consumers view others who do not stand to gain personally by promoting something as highly credible'. In other words, 'consumers trust their friends and other consumers more than they trust marketers' (Kardes et al., 2010: 96). This might be because customers are growing increasingly cynical of media relationships with advertisers, leading them to rely on the word of other customers before making a purchase decision (Mudie & Pirrie, 2006).

Comparing WoM with advertising, it can be noted that WoM is characterized as an interactive, bidirectional, and more believable communication channel (Fill & Turnbull, 2016). In many cases, WoM is proven to be 'the most powerful communication tool of all, and it has the benefit of being free' (McDonald et al., 2011: 9). However, it could also be a high-risk communication channel. Kotler and Keller (2006: 420) suggest that 'on average, a satisfied customer tells three people about a good product experience', while 'the average dissatisfied customer gripes to 11 people'. Therefore, companies should strive to achieve customer satisfaction and use it as a marketing tool to avoid the negative influence of WoM. A satisfied customer might become loyal, and 'loyal customers tend to recommend their provider to other current or potential customers' and 'help to attract new customers through word-of-mouth communications' (Bruhn & Georgi, 2006: 126).

WoM is especially important in the service industry due to the intangible nature of service products (Brassington & Pettitt, 2005). Kotler and Keller (2006: 404) state that services are 'generally high in experience and credence qualities,' which increases the risk in the purchase, leading consumers to 'rely on word of mouth rather than advertising'. Therefore, testimonials from satisfied customers can be an effective tool in reassuring potential customers 'that the service works and that the outcomes will be positive' (Brassington & Pettitt, 2005: 441). Service providers should strive to initiate WoM communications through recommendations from existing customers (Bruhn & Georgi, 2006).

The development of technology, especially the rise of the Internet, has allowed WoM to spread faster and farther than ever before through various channels such as 'cell phones, email, text messaging, social networking sites, blogs, instant messaging, chat rooms, and message boards' (Kardes et al., 2010: 317). Carr and Hayes (2015) define social media (or social networking sites) as Internet-based channels that allow users to interact and selectively self-present with broad and narrow audiences who derive value from user-generated content and the perception of interaction with others. Smith et al. (2012: 104) identify Twitter, Facebook, and YouTube as the most prominent social networking sites, with each site having its unique content and interaction methods. Twitter is a micro-blogging site that allows people to publish, reply to, and forward posts of limited length. Facebook allows users to 'create profiles featuring personal information, interests, and photos,' with the possibility of sharing content between friends. YouTube is a content community that 'allows users to post, view, comment on, and link to videos on the site'.

Social media has allowed users to express their feelings and opinions, create and share content in a web environment, and interact with others without time and space limitations (Mese & Aydin, 2019). The online spread of content is called User-generated Content (UGC). User-generated Content is defined as 'any kind of text, data, or action performed by online digital systems users, published and disseminated by the same user through independent channels, that incur an expressive or communicative effect either on an individual manner or combined with other contributions from the same or other sources' (Santos, 2022: 108). It is important to note that while the WoM spread through online channels is a type of User-generated Content, not all UGC is also WoM. WoM refers to content made by customers that refer to positive or negative opinions about the products or services of companies (Smith et al., 2012). WoM diffusion has proved to be an important instrument 'for advertising a new idea, technology, content, or product' (Hu et al., 2018: 252), in which 'many individuals participate in spreading information in a chain-like structure'. Although marketers have no control over the exchanged WoM on the Internet, online platforms are still companies' most crucial consumer information source (Schiffman & Wisenblit, 2019).

Nevertheless, how can companies use WoM as a nonmarketing source to achieve their goals? According to Mudie and Pirrie (2006), personal recommendation is an assertive communication and persuasion tool, especially in the service sector. Marketers can influence it by encouraging current users to in-

form others of the product or service, encouraging users to write testimonials, providing promotional items, employing brand ambassadors, and providing a feedback communication channel with customers. Also, marketers can target 'opinion leaders and use networking opportunities at trade shows, conferences, and public events' (Hoyer & MacInnis, 2010: 409) to generate positive WoM. However, it is crucial to integrate promotional activities, especially for media advertising and WoM, to work together to influence a product's popularity (Jalilvand, 2017). Because 'marketing and nonmarketing sources differ in their impact, the effect on consumers may be greatest when marketers use complementary sources of influence' (Hoyer & MacInnis, 2010: 390).

In conclusion, WoM is credible, authentic, and believable because it is assumed that 'the friend, neighbor, co-worker, or chat-room buddy engaged in word-of-mouth is someone whom you know and trust, and their opinions are honest and true, free from ulterior motives' (Kardes et al., 2010: 317). Customers, therefore, value WoM recommendations because they 'provide information and purchasing support and serve to reinforce an individual's purchasing decisions' (Fill & Turnbull, 2016: 51).

2.2. Word-of-mouth in Higher Education

Higher education institutions (HEIs) are players in the consumer market as organizations that provide educational services. They belong to the category of service providers. They are 'known as service organizations' (Mudie & Pirrie, 2006: 1). Educational services are defined as 'an aggregate of knowledge and skills, aimed at meeting the various needs of the individual, society, and the state as a whole' (Ziyadin & Serikbek, 2020: 293). HEIs, like other organizations/companies on the market, use promotional tools and activities to communicate with their target audiences. WoM is an essential tool in achieving marketing objectives for HEIs because satisfied graduates can become 'part of the most effective network of word-of-mouth marketers for the university' (Maringe & Gibbs, 2009: 158). However, as previously stated, WoM is not directly controlled by organizations/companies. So, how influential is WoM in the higher education context?

The social environment with which potential students interact represents a significant group of influencers and originators of WoM, as confirmed by many researchers. Table 1 provides a brief overview of studies that have identified

nonmarketing communication channels as relevant sources of information for prospective students.

Table 1: Nonmarketing information sources for prospective students

	Information source	Country	Authors
1.	Family	China	Chak-keung Wong and Jing Liu, 2010
		Indonesia	Kusumawati, 2013
		Portugal	Simões and Soares, 2010
		USA	Henry, 2011
		USA	Dial, 2014
		USA	Karl, 2012
		UK	Hawdon, 2012
2.	High school teachers	USA	Pope and Fermin, 2003
		UK	Hawdon, 2012
		Portugal	Simões and Soares, 2010
		Pakistan	Mehboob, Shah and Bhutto, 2012
3.	Peers, friends, and other relevant persons	Canada	Beswick, 1989
		USA	Pope and Fermin, 2003
		Philippines	Tan, 2009
		Poland	Sojkin, Bartkowiak and Skuza, 2012
		USA	Galotti and Mark, 1994
		Pakistan	Mehboob, Shah and Bhutto, 2012
		Germany	Dumitraşcu and Şerban, 2013
4.	Other non-personal independent sources of information (Internet, …)	Poland	Sojkin, Bartkowiak and Skuza, 2012
		USA	Burdett, 2013
		UK	Hawdon, 2012
		Scotland	Briggs and Wilson, 2007

Source: Author

Table 1 shows a list of critical sources of information that are directly related to the generation and spread of WoM in the higher education context. The influence of family, high school teachers, peers, friends, other relevant persons, and all independent sources of information, primarily on the Internet, represents essential support for the student's decision-making process and a basis for the analysis in this paper. Although WoM is a prominent interpersonal communication channel, it 'is difficult to observe and scarcely studied in the higher education marketing field' (Le et al., 2020: 2).

Recent studies emphasize the importance of the influence WoM has in the higher education context. Harahap et al. (2017) identified in their research that WoM significantly influences HEI choice (Indonesia). According to Le et

al. (2020), WoM is very important as parents, family members, teachers, and school advisors were identified as the most influential information sources for student decision-making (Vietnam). Meštrović et al. (2019) identified that friends and acquaintances' recommendations are among the three most used sources of information for students' decision-making (Croatia).

Harahap et al. (2018) identified in their research that university reputation significantly influences student choice (China), but WoM did not result as a significant influencer. Nevertheless, there exists a correlation between university reputation and WoM. Student satisfaction with the studying process at a university can lead to strong recommendations (aka WoM) (Ho & Dang, 2017) and therefore influence the building of a positive image of a university (aka reputation). Positive learning experiences can lead to student satisfaction, which can produce positive WoM and improve the reputation of the higher education institution (Williams et al., 2018). Irfan et al. (2020: 651) concluded that student satisfaction is an 'important part of positive word of mouth, retention, and loyalty' influenced by the educational service's quality. Abbas (2019) also stresses the importance of service quality as a long-term generator of positive WoM (Pakistan). Santini et al. (2017: 13) concluded that student satisfaction is significant because it affects 'attitude toward the higher education institution, intention to recommend, involvement, loyalty, trust, and word-of-mouth. According to students, reputation is an important and influential factor influenced by WoM shared by friends, family members, or past teachers (Canada) (Pizarro Milian & Rizk, 2018). Additionally, HEI's reputation can be maintained through positive WoM shared by alums and students (Vora et al., 2020).

Although WoM is an influential factor in students' decision-making, promotional tools are crucial in providing information for prospective students to make informed decisions about HEI. HEIs often prioritize advertising, such as online ads, television commercials, and promotional items, as their primary promotional tool. However, studies suggest that other communication tools may be more effective, such as public relations to enhance the institution's prestige, direct marketing to build relationships, HEI exhibitions, and Internet use (Ziyadin & Serikbek, 2020). HEI websites are a highly ranked source of information for students (Vietnam) (Le et al., 2020), while 'blogs and wikis, video and slide show sharing tools, discussion tools such as forums, social networks, and micro-publishing tools like Twitter' (Ziyadin & Serikbek, 2020: 294) are also deemed necessary. According to Bhayani (2017), students rely on adver-

tisements, seminars, and direct marketing to gather information about the university (United Arab Emirates). Ho & Law (2022: 8) suggested that 'direct marketing via the institution's official websites and the dissemination of printed materials about the institution and the programs are beneficial and useful for information searching'. The following analysis will provide more insights into prospective students' usage and the importance of marketing and nonmarketing information sources.

3. METHODOLOGY

This study aims to identify the frequency of using WoM as a nonmarketing source of information compared to promotional tools available to higher education institutions but from the perspective of decision-making phases among prospective students. The analyzed phases are as follows: need recognition (when the prospective student recognizes their need for further study at a higher education institution), information search (when the prospective student begins searching for relevant information regarding higher education institutions), evaluation of alternatives (when the prospective student evaluates potential enrollment alternatives), and purchase decision (when the prospective student makes the final choice of a higher education institution).

The survey includes a list of 20 communication channels the respondent used when choosing an institution and a study program. Seventeen communication channels refer to promotional tools, while three refer to WoM. Respondents were allowed to choose the communication channels used during their decision-making process through each phase. The empirical research covers a population of undergraduate and graduate students from different higher education institutions in Croatia, with a sample size of 50 respondents, including 19 males and 31 females. Data analysis was performed using MS Excel.

4. RESEARCH ANALYSIS

For this study, 20 communication channels were divided into two groups: 'Word-of-mouth' with three corresponding items and 'Promotional channels' with 17 corresponding items. The 'Word-of-mouth' group includes recommendations from high school teachers, family members, and colleagues/friends/employers. The 'Promotional channels' group includes presentations at schools,

posters and flyers at schools, posters in public places, TV and radio commercials, the HEI website, articles in media, HEI open days, phone, ads/banners on the web, Google search, Twitter, YouTube, Instagram, Facebook, paid advertising on social media, and email. The analysis displays the number of communication channels used by the respondents. However, it does not measure the strength and significance of individual channels in their decision-making process for choosing a higher education institution.

Table 2: Ratio between the 'Word-of-mouth' and 'Promotional Channels' groups in total

	'Word-of-mouth'		'Promotional channels'		Total
	No.	%	No.	%	No.
Phase 1 - Need recognition	44	20%	173	80%	217
Phase 2 - Information search	19	11%	148	89%	167
Phase 3 - Evaluation of alternatives	33	27%	91	73%	124
Phase 4 - Purchase decision	28	25%	83	75%	111
Overall	124	20%	495	80%	619

Source: Author

Figure 1: Graphic representation of the ratio between the 'Word-of-mouth' and 'Promotional Channels' groups in total
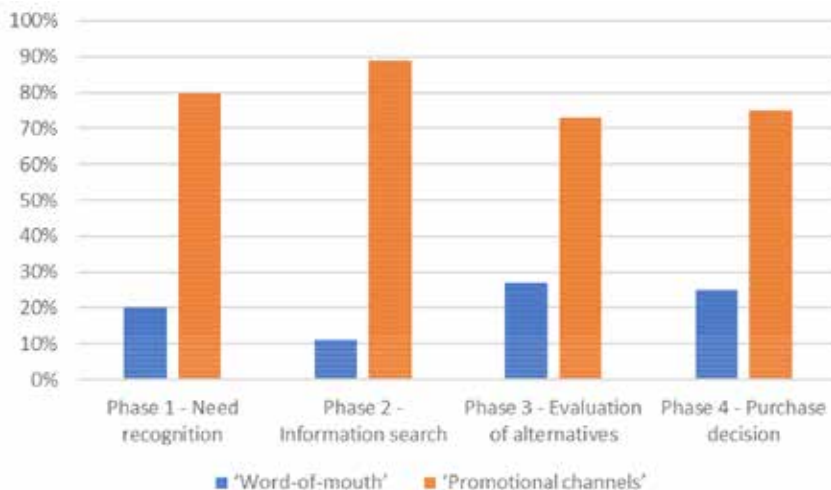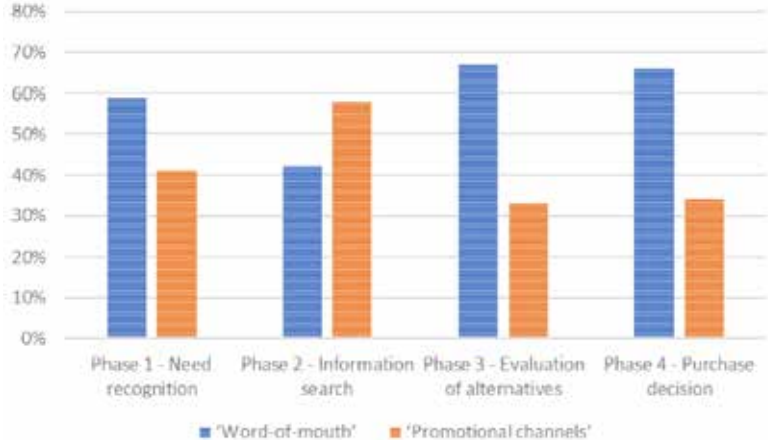

Source: Author

Table 2 and Figure 1 present the ratio between 'Word-of-mouth' and 'Promotional channels' groups based on the total number of items used. The data shows that 'Promotional channels' dominate, accounting for about 80% of the items, except during the information search phase, where the ratio is even higher. This finding suggests that during this phase, potential students use sources that offer more technical information about the HEI, which can help them evaluate alternatives and make informed decisions. However, it is important to note that the number of items in each group influences the sum of occurrences. While only three items were considered for 'Word-of-mouth,' 17 items were included in 'Promotional channels,' leading to a higher sum for the latter. To address this discrepancy, the calculation was adjusted by considering the number of items to equalize the values.

Table 3: Ratio between the 'Word-of-mouth' and 'Promotional Channels' groups per unit

	'Word-of-mouth'		'Promotional channels'		Total
	No.	%	No.	%	No.
Phase 1 - Need recognition	15	59%	10	41%	25
Phase 2 - Information search	6	42%	9	58%	15
Phase 3 - Evaluation of alternatives	11	67%	5	33%	16
Phase 4 - Purchase decision	9	66%	5	34%	14
Overall	41	59%	29	41%	70

Source: Author

Figure 2: Graphic representation of the ratio between the 'Word-of-mouth' and 'Promotional Channels' groups per unit

Source: Author

Table 3 and Figure 2 present the ratio of 'Word-of-mouth' to 'Promotional channels' groups regarding the unit value or average value. The number of occurrences is divided by the number of items in each group to obtain the ratio per unit item. For instance, the total sum per phase for 'Word-of-mouth' is divided by 3, while for 'Promotional channels', it is divided by 17. The results in Table 3 have been rounded off to the nearest integer to simplify the data presentation. This calculation equalizes the occurrence values for both groups, and the results show a completely different picture. 'Word-of-mouth' dominates in all phases except the second phase of the information search, where technical information about the HEI is mainly obtained through the HEI website, which is highly represented in all decision-making phases and other promotional tools.

A similar study was conducted to evaluate the role of WoM in different phases of the student decision-making process. Sidhu and Saini (2022) identified that electronic WoM (WoM in the digital space) significantly influences each phase of the decision-making process, except for the information search phase, where its impact is relatively lower, aligning with the findings of the current study. Galan, Lawley and Clements (2015) conducted a study that highlighted the significant role of WoM from friends, acquaintances, and electronic sources in all phases of the student decision-making process. Specifically, in the information search phase, social media platforms were predominantly used to access information about higher education institution (HEI) programs and eWoM. Moogan, Baron and Harris (1999) found that WoM remains relevant throughout the prospective student decision-making process, mainly using HEI brochures and other materials in the information search phase. Mihai-Florin, Dorel and Alexandra-Maria (2006) and Schimmel et al. (2010) identified the HEI website and brochures as the primary sources of information for prospective students during the information search phase.

Additionally, Royo-Vela and Hünermund (2016) emphasized the importance of internet searches and university database websites in obtaining relevant information about courses and universities during the information search phase. These conclusions are consistent with the current research findings, indicating that WoM is a significant source of information throughout all phases of the decision-making process. In contrast, other sources, such as the HEI website and promotional materials, are crucial in the information search phase.

5. DISCUSSION

This analysis reveals that prospective students primarily rely on recommendations and WoM as information sources when choosing a higher education institution. This highlights the importance of WoM as a communication channel, which should be taken seriously. The challenge for higher education institutions is to find indirect ways to act on this influential channel, as direct promotion does not create WoM. The analysis also shows that WoM is not the exclusive and dominant source of information; without promotion, higher education institutions would lose significant influence on the higher education market. It is evident that WoM and promotion complement each other and that one medium should not be excluded or belittled concerning the other. The effect can only be achieved through the smart synergy of all media and channels. The results show that WoM is a widely used source of information, although its importance in a student's decision-making process cannot be determined. The question is how to use this highly represented medium to gain a competitive advantage in the higher education market.

It is necessary to consider the limitation of this study, which was conducted on a small sample of about 50 respondents, which is not representative enough to conclude. Therefore, it is desirable to research a larger sample. The recommendation is that in future research, the significance of the influence of individual media on a student's decision to choose a higher education institution should also be determined, in addition to determining the frequency of use of individual media, in order to gain a comprehensive picture of the communication process in the higher education market.

6. CONCLUSION

Finally, it can be concluded that WoM and promotion have a significant role in communication in higher education. The relevance of this paper can be projected through the contribution it provides, scientific and practical. The scientific contribution of this analysis is twofold. Firstly, it offers valuable insights into the relative importance and usage of WoM and promotional channels throughout the decision-making process of prospective students in the higher education market. Secondly, the analysis sheds light on the dynamics of information-seeking behavior within the higher education market. It reveals that WoM dominates the overall communication landscape. However, promotional

channels gain prominence during the information search phase as potential students seek more technical information about higher education institutions. By examining these dynamics, the analysis contributes to the existing knowledge of communication and decision-making in the higher education sector. It deepens the understanding of how prospective students gather and evaluate information and highlights the role of different communication sources in shaping their choices.

The practical contribution of this analysis for higher education institution management lies in providing valuable insights that shape their communication and marketing strategies. Understanding the information needs of prospective students and their channel preferences during each phase of the decision-making process is crucial for developing targeted and effective communication plans. By tailoring information delivery to specific needs during each decision-making phase, HEIs can influence prospective students more and ultimately guide their choice of institution. Recognizing the significance of WoM, HEIs must utilize their promotional tools to foster positive WoM among prospective students and their influential networks. Considering these practical implications, HEI management can optimize their communication efforts, actively engage with prospective students, and enhance their overall competitiveness in attracting and retaining students. This includes developing well-informed messaging, leveraging appropriate communication channels, and allocating resources effectively.

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HIGHER EDUCATION MARKETING: A CONTENT ANALYSIS OF THE BEST UNIVERSITY TIKTOK ACCOUNTS

Erik RUŽIĆ, Ph.D.
Juraj Dobrila University of Pula
Faculty of Economics and Tourism "Dr. Mijo Mirković"

E-mail: erik.ruzic@unipu.hr

Abstract

Due to the spread of technology and smartphones, many people, especially youngsters, spend much time online. Social media are the most common and time-consuming way of online spending for young generation members. Statistical data shows an impressive number of social media users and an impressive amount of time spent on social media. Thanks to these facts, organizations, especially those directed to young generation members such as universities, should consider using social media for communication, engagement, loyalty development, and even educational purposes. One of the most popular social media at the moment is TikTok. TikTok has a substantial share of creators aged 18-24 who are the target market of universities. Despite the opportunities offered by this media to universities, there is still not enough research on this topic. The paper's primary purpose is to investigate the content posted on TikTok by the leading world universities, which are expected to be the leaders in social media use. The study covered ten universities from the Academic Ranking of World Universities list, also known as the Shanghai Ranking of World Universities, for 2022. The study conducted a content analysis of the five most viewed videos from each account of the top 10 institutions from the Shanghai list with an official TikTok account. Content analysis is widely used when analyzing video-based communication. The conducted research highlighted the quantified impact (number of likes, comments, savings, and reposts), video content (video topics, emotions, characters), and video format specificities (such as background music, subtitles, text on video, length, trending and hashtags) of the most viewed TikTok videos created and posted on the official accounts of

the ten most successful universities. Based on the present research, the body of knowledge will be expanded by adding new insights about this insufficiently researched hot marketing topic. Based on the research results, universities will be able to improve their social media presence, to design more effective social media strategies to promote themselves and bond with current and potential students via exciting and engaging content.

1. INTRODUCTION

Social media impact people's lives in many ways, and despite several adverse effects, today, they are an integral part of many worldwide users' daily routines. According to Statista (2023), there are 4.7 bn global active social media users, with the global social media penetration rate at 58.4%; the world's largest social media market is China, and the daily time spent on social media worldwide is 147 minutes, and the most downloaded social media app today is TikTok.

Most social media advertising spending is generated in the United States, and increased exposure is the maximum benefit of social media marketing (Statista, 2023). Moreover, 49.1% is the share of global TikTok creators aged between 18 and 24, and most active TikTok users are also aged 18-24 (41.7%). In comparison, the majority of global Instagram audiences are aged 25-34 (31.7%), followed by users aged 18-24 (30.2%) (Statista, 2023). Young people were born and raised with rapid technological advancements and are surrounded by smartphones and social media, their indispensable daily tools and activities.

The figures above show that organizations, especially those directed to young users, should embrace new communication channels and tools. Institutions such as universities, despite their conservatism, should communicate with their current and potential users (i.e., students) via social media channels and even use them as an educational tool (Draganić et al., 2021; Afidah et al., 2021; Zea & Heekyoung, 2019; Xu et al., 2019).

There are many negative consequences brought by social media usage. However, social media provider is also an opportunity to reach young people's needs and preferences and convey the wanted message more effectively.

Xu et al. (2019) pointed out that short videos used for socialization are gaining particular importance among netizens nowadays. The application based on short videos is TikTok, the most popular among the student-age population and most downloaded (Statista, 2023).

Despite the opportunities offered by social media and especially TikTok, there is no considerable research on the topic, especially in university settings (Montag et al., 2021; Alexandro et al., 2022).

The paper's primary purpose is to investigate the characteristics of the most engaging content published by the leading global universities, which are also expected to be seen as leaders in social media use in the educational field.

The conducted content analysis can help universities in their efforts to use social media effectively in order to promote themselves and bond with their students via exciting and engaging content. Moreover, the current research can help universities shape better and more effective marketing strategies. In addition, digital marketing professionals can use the results to improve their strategies when offering services to educational institutions.

The body of knowledge will expand by providing new insights into this insufficiently researched hot marketing topic.

The paper consists of six chapters. After the introduction, a literature review is presented. The third section encompasses the materials and the method applied and presents the data collection details and the content analysis setup. The fourth chapter describes the content analysis results. The fifth chapter outlines the discussion and the implications of the research. The last chapter highlights the conclusion and limitations of the present study and provides directions for further research.

2. LITERATURE REVIEW

The growth of new technologies has brought many changes to organizations and customers; organizations' competitive positions are threatened, and customers' power is increasing. Likewise, social media have brought new ways to assess, choose and buy goods and services (Alves et al., 2016). Due to the above changes, organizations in general and higher education institutions should also change and adjust their marketing and especially communication strategies (Alves et al., 2016). More than ten years ago, Constantinides and Stagno (2011)

argued about the growing use of social media for marketing and the growing interest in the tool from higher education institutions. According to Constantinides & Stagno (2011), these institutions use social media intending to reach and attract future students.

On the other hand, future students use social media primarily for social interaction and information seeking (Constantinides and Stagno, 2011). Moreover, Generation Z members (born between 1995 and 2012) are raised with technology, smartphones, the internet, and social media. These digital natives started school younger than ever. They are formally well-educated and likely to stay in education longer than ever (Mc Crindle, 2010 in Desal, 2017). Furthermore, they spend much time online using social media platforms and are constantly connected (Desal, 2017).

According to Statista (2023), in July 2022, there were 5.03 billion internet users and 4.7 billion social media users worldwide. Moreover, according to historical data and projections, the trend and the expected number of social media users in the future will grow (Statista, 2023). The time spent on social media has grown yearly, reaching 147 minutes in 2022 (Statista, 2023). According to recent data (Statista, 2023), the largest share of viewership by age range on various social media platforms is TikTok (18-24; 41.7%), YouTube (18-24; 34.62%), Facebook (25-34; 31%), and Instagram (25-34; 31.7%).

Because of this daily and constant use of social media by the younger generation, social media should be part of every organization's marketing strategies that target these young people. Moreover, a substantial share of 41.7% of TikTok users are young (universities' target) users whose average daily time spent on TikTok amounts to 52 minutes (Ma & Hu, 2021).

Despite many controversies, TikTok is still among the most popular social media today. Based on the active users, TikTok is ranked as the sixth most popular social media in 2022 (after Facebook, YouTube, WhatsApp, Instagram, Weixin/WeChat). TikTok was developed by ByteDance, a Chinese startup based on Douyin (the app's version for the Chinese market). While Douyin was launched in 2016, TikTok combined with Musica.ly (a ByteDance acquisition) was launched in 2017 (Ma & Hu, 2021). TikTok was launched in 155 countries and regions in 75 languages (Moshin, 2020 in Ma & Hu, 2021).

Xu et al. (2019) highlighted that among the reasons for TikTok's success are effective marketing strategies, quality algorithm, and successful satisfaction

of users' needs. Among the negative facets of TikTok, the authors mentioned above highlighted a non-existing profit model (consequent lack of liquidity), fake goods invading the app, and insufficient supervision by the platform and content homogeneity that lead to users' loss of interest (Xu et al., 2019).

Given the above, with its effective algorithm, broad user base, and video sharing content, TikTok can be a platform in many fields. TikTok is getting salient interest among marketers. In an educational context, it could be used in two ways: it can be used as a marketing tool (communication), and, maybe even more important, it can be used in education (i.e., the educational process). Social media, which could be viewed as a focus destroyer, can be turned around and used for enlightened aims.

Studies highlighted the role and the potential role of TikTok in education process improvement (Draganić et al., 2021) as well as the possibility of using it in different fields of study or study topics, e.g., it can be used to study English (Afidah et al., 2021) or to learn and share achievements in different fields such as cooking, drawing or crafting (Zea & Heekyoung, 2019) or even maths, chemistry or physics (Khlaifi & Salha 2021).

Besides that, Azman et al. (2021) stated that Tik Tok could be used in higher education in multiple ways; for brand and reputation development of an institution and knowledge transfer. Gupta and Bashir highlighted four social media functions: informative, entertaining, socialization, and academic (Alexandro et al., 2022). Based on all the above considerations, the current research was conducted to expand the knowledge in the specific field (TikTok in higher education).

3. MATERIALS AND METHOD

3.1. DATA COLLECTION

This study included ten universities from the list of *22 Academic Rankings of World Universities, also known as Shanghai Ranking's Academic Ranking of World Universities* for 2022 (Shanghai Ranking, 2022). The ranking was first published in 2003, and since 2009 it has been published by Shanghai Ranking Consultancy, an independent organization not subordinated to any university or government. In the list, six indicators are used to rank world universities:

number of alums and staff winning Nobel Prizes and Fields Medals, number of articles published in journals of Nature and Science, number of articles indexed in Science Citation Index Expanded and Social Sciences Citation Index in the Web of Science, per capita academic staff performance and number of highly cited researchers selected by Clarivate. The study aimed to discover the characteristics of the most viewed (i.e., successful) videos published by the most successful world academic institutions. The first step in the research process was to find the official TikTok accounts of the best world universities, according to the mentioned list. To this end, a search on the TikTok application was performed using abbreviations or full official names of the listed universities. In the research, only TikTok-verified accounts were analyzed (a verified account is the one with the blue check mark – verified badge). Universities' TikTok verified accounts were found and chosen following the list, starting from the first-ranked university, for ten accounts. On each account, the five most viewed videos were analyzed. The data was analyzed from 17 to October 21, 2022.

3.2. ANALYSIS OF TIKTOK ACCOUNTS

In order to analyze the accounts, an Excel worksheet with different dimensions was prepared. The author collected the following data for the analysis: the university's name, country of origin, date of first TikTok video posting, number of followers, number of videos posted, the total number of likes, and the total number of following accounts.

Furthermore, in order to analyze the five most-viewed videos on the accounts of the first ten institutions from the Shanghai list with an official TikTok account, a content analysis was performed. Content analysis is widely used when analyzing video-based communication. Setting up a coding scheme for short videos was challenging, and only the publicly available data on the TikTok platform could have been used. A previous study on TikTok healthcare-related videos (Zhu et al., 2019) was used as the base, and the coding was slightly adjusted to analyze higher education institutions' videos. An initial analysis of five videos was used as a pilot for the final coding scheme. The final coding consisted of general data (mentioned above) and three dimensions: quantified impact, video content, and video format (Figure 1).

Quantified impacts embedded the number of views, number of likes, number of comments, number of savings, and number of reposts of each video. Video

content embedded the video theme (about the courses, about the faculty, about additional offers (like dormitory, for example), about the city or region, about happenings, about exciting and contemporary fields or topics covered by the faculty, about students, about interesting things, projects, or something else), emotion (relaxed, humorous, motivational, inspiring, profound, formal, positive, informal, without emotion), character (professor(s), student(s), supporting staff, someone else, not possible to identify). Video format dimension included the following factors: background music, subtitles, text on video, length, and trending usage. Additionally, types of hashtags used in the most-viewed videos were collected.

Figure 1. The coding framework

Quantified impact		
Number of likes	Number of comments	Number of savings
Number of reposts		

Video content		
Video theme	Emotion	**Character**
About the courses	Relaxed	Professor(s)
About the Faculty	Motivational	Student(s)
About additional offers	Humor	Supporting staff
About the city/region	Inspiring	Someone else
About happenings	Serious	Not possible to identify
About interesting and contemporary fields or topics	Formal	
About students	Positive	No characters
About interesting projects	Informal	
	No emotions	

Video Format				
Background music	Subtitles	Text on video	Length	Trending
	Hashtags			

Source: Author, based on Zhu et al., 2019

4. RESULTS

The goal was to analyze the five most successful (most-viewed) videos of ten universities ranked by the Shanghai Ranking, starting from the first one in the

list. The last analyzed institution with a TikTok-verified account was the University of Sydney, ranked 60th. In other words, among the world's first 60 best academic institutions, only 10 have an official TikTok account.

Among these ten institutions, four were from the USA, and two were from Australia, Canada, and Great Britain. The University of Cambridge (Great Britain) was the first to upload a micro-video in June 2020. All the other accounts uploaded their first video from July 2020 to September 2022.

The total number of followers of all the institutions is 212,882. The institution with the greatest following, the University of Cambridge (Great Britain), has 86,200 followers. The total number of posted videos is 1,142. The institution with the most videos posted is the University of Cambridge (Great Britain). The total number of likes is 2,738,449, and the institution with the most likes, the University of Sydney, Australia, has 984,200 likes. The total number of following accounts is 584, and most accounts are followed by the University of Cambridge (Great Britain). Detailed information is presented in Table 1.

Table 1 General information on TikTok accounts run by the best world universities

Institution	Country	First-time video uploaded	Number of followers	Number of videos posted	Total number of likes	Number of followed accounts
University of Cambridge	Great Britain	26.06.2020	86,200	266	634,100	174
University of Toronto	Canada	17.12.2020	17,600	74	343,100	76
Imperial College London	Great Britain	22.1.2022	8,243	41	236,000	21
University of Michigan-Ann Arbor	USA	26.4.2021	15,900	263	257,200	75
Northwestern University SPS	USA	3.9.2022	163	10	230	12
University of Melbourne	Australia	19.10.2020	37,100	131	144,400	71
University of Manchester	England	16.7.2020	7,958	217	120,800	80
University of British Columbia	Canada	27.2.2021	1,923	40	14,100	22
King's College London	England	30.8.2022	1,195	9	4,319	11
University of Sydney	Australia	25.11.2021	36,600	91	984,200	42
Total			212,882	1,142	2,738,449	584

Source: Author

Analyzing the quantified impact of TikTok videos (i.e., number of views, likes, comments, savings, and shares) was also helpful. The total number of likes for all the videos was 1,758,073, ranging from 20 to 302,700. The total number of received comments was 12,459, ranking from 1 to 3,637. The video with the most likes was an interview with a student to students, with questions about

their studies, exam sessions, and other study-related questions. The video with the most comments was the one in which a professor provides her views about the Ukrainian War based on her experience. It is interesting to highlight that only three videos have reached more than 1,000 comments (about the Ukrainian war, students' graduation, and the discovery of insulin). Most (26) were under 100 comments. The total savings has reached 60,058, ranging from 0 to 12,000. The video with the most savings was about students' life (the one with the most likes), followed by 10,600 savings of the video about the insulin discovery. The shares have reached 28,611, with the videos about the Ukrainian war reaching 14,800, while 24 videos were under 100 shares, and only three videos were shared more than 1,000 times. The most often used hashtag was the one connected with the respective universities (such as #CambridgeUniversity, #imperialcollege, and similar).

Regarding video topics, most videos focus on happenings connected with "faculty life" (students' graduations, students' life, university facilities, careers, etc.). The second most frequent topic can be "about students" (students practicing sports, students' music preferences, current students' advice for freshmen, preparations for the upcoming academic year, typical student's day at the university, interviews with students, and the like). The third most common video topic can be named "current affairs and useful advice" (Ukraine, Putin, insulin, a famous movie recorded on the university grounds, a student's advice on how to avoid mosquitoes, and similar). The video with the most views – 2,500,000 (account of the University of Sydney) - was an interview from a student with students about how they learn when the exam session is similar, conducted in students' natural habitat (library).

When it comes to feelings, the prevailing ones were relaxed (10/50), followed by positive mood (8/50), sometimes with humor (7/50), but often (20%, 10/50) with no feelings expressed.

In terms of characters, in 14 videos out of 50 (28%), there was a student in it. Besides that, in 8 videos (16%), the main characters were students. Students (one or more) appeared in 44 % of the videos analyzed. In 10 videos (20%), there was no main character. In five videos (10%), there were professors. In 1 video (2%) professors and students together, in 1 video (2%) faculty's non-teaching staff, in 1 video (2%) a professor and others (non-professor, non-student and non-teaching staff), in 1 video (2%) a professor and a student,

in 1 video (2%) professors, students and non-teaching staff, and 1 video (2%) presented a professor, a student and a person who is not a professor or a student or non-teaching staff. In 6 videos (12%), people were without direct connection to the faculty. In 1 video (2%), it was not possible to define the role or identity of the main character in the video. Out of 25 videos (50%) that featured side characters, in most of them - 12 (i.e., 24%) - appeared students.

Regarding the video format dimensions, the background music was present in 39 (78%) videos, while 11 (22%) videos were without background music. Subtitles were present in 10 (20%) videos, while 40 (80%) were without subtitles. On 35 (70%) videos, there was text. Regarding the duration, most videos - 25 of them (50%) - lasted up to 16-60 s, 13 (26%) 0- 15 s and 12 (24%) up to 1- 3 min. Only six videos (12%) were based on a trend.

5. DISCUSSION AND IMPLICATIONS

Education is a critical element in the achievement of quality and competitiveness of a nation through human resources. Hence, educational institutions must follow current trends and "customer" needs. Social media is today's reality and the most time-consuming activity for young people. Among many available social media, TikTok is gaining the most importance today. Montag et al. (2021) pointed out insufficient research about aspects related to TikTok.

The current research was conducted to expand knowledge about TikTok, the most popular social media. Of particular interest was the use of TikTok by the most prominent world universities. The study showed that among the sixty best-ranked universities, only ten have an official TikTok account (every sixth university). Since educational institutions are usually very conservative, the number mentioned above of official TikTok accounts may be significant. Despite their conservatism, all organizations adopt some kind of marketing approach to "customers" and "potential costumers" and universities should not be an exception.

Moreover, within the global audience, 41.7 % of TikTok users are aged between 18 to 24 years (23.8 % female and 17.9% male) (Statista, 2022). The United States is at the top of the list of universities with an official TikTok account (the United States is also number one, considering the number of universities listed on the Shanghai Ranking). Universities "discovered" TikTok in

2020; the first videos were posted then, but other universities have followed the example since that year. This is entirely understandable, considering that according to Statista (2023), the projected number of global users will increase 15 percent year-over-year, reaching 955.3 million users in 2025. Moreover, social media can be used not only as a promotional and communication tool but as an educational tool. This is especially important for younger generations with a significantly short attention span. Social media impacts teaching methods, and based on the youngsters' preferences, the curriculum can be made interesting by sharing it in small, bite-sized pieces. TikTok can be seen as a multifunctional platform for educational institutions. Students should be involved in the educational process and involved in the faculty life, as the consistent number of comments and views showed that students are willing to be engaged if the communication is adjusted to their needs. It should also be highlighted that engagement was maybe the most challenging task on social media (most observed videos had less than 100 comments). When it comes to topics, the most-viewed videos were the ones focused on students themselves, universities' related content, and usefulness. This means universities can create exciting content based on everyday activities (universities have enough "material" to create engaging content). Universities should also provide students to students content. Students prefer a relaxed and cheerful mood in the provided content, but due to universities' specificities, the provided content was sometimes without emotion (objective, scientific).

Nevertheless, humor was also used from time to time. Regarding characters in the videos, as mentioned before, students were the most frequent characters (as main or side characters) (44%). Moreover, this is only logical because they can be seen as more reliable university promoters; a peer standpoint, peer recommendation, or own experience is more credible than a paid ad. As a significant contributor to an excellent customer (i.e., student) experience, professors were also present in videos (10%). Other characters comprised combinations of teaching staff, non-teaching staff, students, and people with no visible connection to the university, and often (10%), there was no main character. As expected, due to the type of social media, most of the videos were with music (78%). However, opposite to the expectations, most videos were without subtitles. Today's generation uses their smartphones while walking, traveling, and surrounded by other people, so it could be helpful to add subtitles to allow them to consume content on every occasion, even though youngsters today often use

headphones. In order to catch and keep the attention, most videos (70%) included some text. This can impact the consumption time. Most of the videos were medium in length (in terms of social media length), lasting from 16 to 60 seconds. Due to the mentioned specificities of the organizations and their mission, only in 6 cases was a trending used to spread content. Universities could use trending as fancy packaging for spreading desired content more often. It is challenging to be interesting, convey the desired message effectively, engage users, and stay within the borders of a severe institution with the critical mission of developing young people.

To conclude, to attract followers, universities should create micro-videos related to faculty life, students, and current affairs and advice. The videos should be relaxed, positive, and sometimes with humor or no feelings at all. The hashtag connected with the respective institution should always be added. The video characters should be predominantly students, but professors, non-teaching staff, and other roles are also welcome. Using background music without subtitles but with text on videos is advisable. The videos should optimally last up to 16-60 s.

Based on the research conducted, marketing agencies and universities can improve their promotional strategies and overall communication by providing engaging content with many positive outcomes for them, such as improving loyalty, WOM, positively impacting potential students' perceptions, improving the image, and as well the number of students prone to enroll in university programs.

6. CONCLUSION

Like many other entities, schools and universities should also undergo digital transformation. Gen Z's massive use of social media should be seen as an opportunity for the educational system. Social media should be incorporated into the learning and communication system to align with the needs and wants of young people.

The paper investigated this new and insufficiently studied phenomenon to provide valuable insights and enrich the understanding of social media use by universities. The research examined how universities use the micro-sharing platform to communicate with current and potential students and which fea-

tures are common to the most successful content. The results should encourage further research to expand the knowledge about the positive use of this unavoidable tool –social media.

Most universities, as demonstrated, have only relatively recently started to get experience using TikTok in communication (the oldest accounts were opened in 2020), so the best practices should be found and adopted widely. Even though TikTok is a new social media, it has the most traction. Its users are mainly at the age of higher and secondary education, i.e., current and, especially, future students. Like all media, TikTok has its own rules and formats. Universities need to create engaging content to attract new students and provide value to existing ones. The research showed that medium-length video content (up to 60 s), whose main characters are students and whose topics are relevant to the study or institution's themes, is the most appreciated. At the same time, it was proven that students are interested in critical contemporary events and situations (one of the most-viewed videos was about Ukraine). The tone was primarily relaxed and positive. As for its specificity, TikTok requires background music (though the created material may as well be with spoken voice or without music), and often a text should be included. Considering that most of the best world universities, according to the Shanghai list, are from the USA, most of the found TikTok accounts are also from the States.

The study had several limitations. TikTok is a hot topic, and there is still not enough research on the topic, especially in the educational context (for educational purposes and communication purposes of educational institutions), so only descriptive statistics were used to explore the use of this platform. Only the ten universities selected and their most successful five videos were analyzed. Moreover, content analysis is often used in video analysis, but it can have some limitations when applied to short-form videos. Future research should encompass a more comprehensive number of institutions and videos. Software and apps, or even artificial intelligence, could provide deeper insights and knowledge due to a more significant number of analyzed videos.

Moreover, the top 10 world universities, according to the Shanghai list, were analyzed with the idea that the best universities are also leaders in using new approaches and tools such as TikTok. Perhaps a relevant source that identifies the universities with the most followers should be found, and then their videos should be analyzed. Likewise, the most successful videos with specific

"education-related" hashtags should be analyzed to gain knowledge about using TikTok for educational purposes. Moreover, followers (i.e., current and potential students) can be asked about their attitudes toward using the platform for educational and communication purposes. In addition, potential students can be asked at which step of the buying journey they check this social media. It would also be interesting to find out who manages the official university accounts (external agencies, staff, students, or someone else) and if there is a (marketing) strategy for using social media.

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INTERRELATIONSHIP OF SPECTATOR-BASED SPORTS TEAM REPUTATION, FAN IDENTIFICATION AND PURCHASE BEHAVIOUR: A CASE OF FANATIC FANS

Mario PEPUR, Ph.D.
University of Split, Faculty of Economics, Business and Tourism

E-mail: mpepur@efst.hr

Ljiljana NAJEV ČAČIJA, Ph.D.
University of Split, Faculty of Economics, Business and Tourism

E-mail: ljnajev@efst.hr

Goran DEDIĆ, Ph.D.
University of Split, Faculty of Economics, Business and Tourism

E-mail: goran@efst.hr

Abstract

This research examines football fans' perceptions of sports team reputation and the relationship between reputation components and fan identification. Data was collected using a sample of 275 fanatical and dysfunctional football fans of a professional football club in Croatia. The scales employed are the spectator-based sports team reputation scale (SSTR) and the fan identification scale. Data were analyzed using nonparametric statistics and the decision tree classification technique. Descriptive indicates high perception for two components of reputation: team tradition and spectator orientation, as well as for fan identification. Statistically significant differences in the ranks among groups based on financial stability, social responsibility, and management quality components related to fan identification were determined. Management quality perception can be used as a predictor of club membership, while financial soundness can

predict season ticket holding. The results can serve as a foundation for sports team reputation and fan identification relationship models in the context of particular fan groups. The main limitation of the research is a sample of only one sports club fan base. Therefore, the results should be taken with precaution.

Keywords: *football fans, team reputation, identification*

JEL Classification: *C38, M31, Z29*

1. INTRODUCTION

Football is one of the most, if not the most, popular sport globally. Major football competitions such as the Champion's League or World Cup reach audiences of billions (Richter, 2023). They are recording a steady rise in interest and viewership numbers (FIFA, 2022), with more than 5 billion people estimated to have seen at least a part of the World Cup 2022. All of these trends are linked with positive financial outcomes for significant clubs and leagues in the game – the "Big Five" leagues (England, Germany, Spain, Italy, and France) are seeing continuous growth of revenue for the past ten years (with a slight dip during the initial stages of the COVID crisis) (Statista, 2022; UEFA, 2023). While the commercial side of the football business, when observed on a macro level, does indeed sound positive, things are not so unanimously positive when looking at a more detailed picture. Namely, while most popular clubs and leagues draw a significant amount of attention and financial resources from both commercial entities (international sponsors, broadcasters, etc.) and fans, smaller national leagues and clubs are facing more challenges in drawing the attention of sponsors and are dependent on national broadcasters, commercial entities, and supporters to a much higher degree.

Football as a game and a social phenomenon has drastically changed during the past 30 years. Whereas the roots of football fandom lie in the working communities of the early 20th century United Kingdom, for which football provided a vehicle for building local identities, modern football is more detached from its locale and geared towards individual consumers of football as spectacle (Gonda, 2013). Increased professionalization and commercialization of football began in 90's Europe. The impetus for these changes came from the crisis facing football as a spectator sport during the 70s and 80s. Dropping stadium attendance and increasing violence with high-profile tragedies (e.g., the Heysel disaster) led to significant changes to legislation governing acceptable behaviors

during football matches and increased consequences for problematic behaviors coupled with a complete shift of approach to managing football clubs. This shift was initiated in the United Kingdom by establishing the FA Premiership and introducing more market-oriented practices in managing football clubs, treating them as true business ventures (Hill et al., 2018). Changes introduced in this process resulted in reduced stadium violence, higher attendance numbers, and media coverage, all contributing to better financial results in the most attractive football leagues. In a way, football has become an integral part of the global entertainment industry, with football stars reaching celebrity status (Gonda, 2013). However, these changes also resulted in increased discontent from traditional and fanatic football fans, who saw increasing prices of tickets, a 'sanitized' atmosphere, and focus on commercial results as moves away from the 'true' supporters and towards a gentrified supporter experience. Hence, the movement against the commercialization of football and the changes it is bringing to the stadiums – so-called "modern football", arose.

While professional sports, in general, and professional football, is a crucial business domain, treating sports fans as just another type of consumer could be very short-sighted. Fans are distinct consumers due to the extensive and intensive emotional and psychological relations they build with their favorite teams (Clarke et al., 2022). Additionally, as evident from the "Against modern football" movement, a negative side exists to applying a purely commercial lens to viewing fans. Increased commercialization and accompanying changes to the nature of the relationship between clubs and supporters, with football moving ever more towards mass media entertainment, is seen as deeply problematic by most dedicated fans. Classifying them as Football-addicted fans or supporters, Busse and Damiano (2019) emphasize that fans who make the core of genuinely dedicated spectators are characterized by solid affective attachment to their club, considering football as a way of life and staying loyal during both good and poor seasons for the club. This group, in particular, sees extensive commercialization of football as problematic since playing for a particular team is not only a matter of professional decision but also a matter of honor and personal identity. They perceive their relationship with the club they support as more akin to a relationship between family or friends than between commercial entities and consumers (Gonda, 2013).

In contrast to 'casual' fans, who are more interested in the entertainment value of football, fanatic fans provide a stable fan base for clubs, particularly in

smaller and less attractive football leagues. With the effects of football, commercialization felt differently in 'large' leagues and smaller ones (Choluj et al., 2020). It is only natural for the management of clubs in smaller leagues to be interested in building long-term solid relationships with the most dedicated elements of their fan base. Hence, research on the club's reputation as perceived by members of the most dedicated and fanatical fan cohorts can serve as an essential source of insights for the management of football clubs in terms of their relationship with target supporter groups.

Reputation can be conceptualized in different ways, with those approaches commonly including generalized awareness of a company, predictable outcomes of interaction with a company for a consumer, and positive perceptions about a company as dominant or combined elements of the conceptualization. Regardless of the exact conceptualization, reputation has been extensively studied and shown to be the most significant determinant of business success, influencing various beneficial outcomes regarding financial performance, trust, and loyalty (Kircova & Esen, 2018). In sports, reputation is arguably even more critical due to football fans' higher involvement and identification with their favorite teams. Historically, there has been some confusion and overlapping usage of the terms such as image, identity, and reputation. However, recent research provides a clear delineation between those terms. It defines reputation as how the sports team is viewed by its stakeholder groups, with supporters constituting one of the most important ones.

Recognizing the importance of sports team reputation as perceived by spectators, Jang et al. (2015) have developed a scale measuring spectator-based sports team reputation (SSTR). The authors define SSTR as "*the overall perception of a sports team based on spectators' reaction to all previous interaction experiences with the sports team's activities*"(p.53) and conceptualize it as a six-dimensional construct consisting of Team performance, Team Tradition, Team Social Responsibility, Spectator orientation, Management Quality, and Financial Soundness. Spectator-based team reputation has resulted in beneficial outcomes for the team regarding supporters' behavioral and attitudinal outcomes. Namely, team reputation as perceived by spectators and supporters has been shown to influence supporter-team identification and re-engagement intentions (Yousaf et al., 2020) as well as the emotional attachment of the fans (Takamatsu, 2021), their satisfaction and loyalty (Suchao-In et al., 2021).

Fan identification is another important determinant of the relationship between supporters and sports clubs. For numerous reasons, the extent to which spectators identify with the teams they support is essential. Higher fan identification with sports teams has been linked with higher involvement with the team, higher ego-enhancing attribution of team successes and external attributions of failures, higher willingness to spend money and time on team-related activities and merchandise, etc. (Dietz-Uhler & Lanter, 2008). In order to determine the extent of fan identification with the team, a single-factor fan identification scale developed by Wann and Branscombe (1993) was employed.

The main goal of this paper is to examine the interaction of components of the spectator-based sports team reputation construct with football fan identification among fanatic and dysfunctional fans. In order to meet this goal, three research questions are proposed: (1) *Is Sport team's reputation perception playing an essential role in creating fan identification, (2) Are there differences in fan identification among groups based on SSTR components and (3) Can components of the SSTR be used as a predictor of fans' behavior?*

Focused on the most fanatical and dysfunctional fan cohorts, this paper strives to examine differences between group members, clustered according to perceived sports team reputation and fan identity. More precisely, fans grouped into those who perceive various dimensions of sports team reputation as negative, neutral, or positive are compared in terms of the extent of fan identification they exhibit. The research aims to identify interrelations between perceived reputation and fan identification patterns by utilizing a sample of fanatical and dysfunctional fans. Furthermore, behavioral outcomes are tested to identify dimensions of the SSTR, which determine fan behaviors seen as beneficial from the commercial perspective of the sports business.

2. RESEARCH METHODOLOGY, SAMPLE AND QUESTIONNAIRE

Spectator-based sports team reputation (SSTR) was measured using the scale developed by Jang et al. (2015). This conceptualization defines sports team reputation as a six-dimensional construct including Team performance, Team tradition, Spectator orientation, Social responsibility, Management quality, and Financial soundness. Additionally, seven items were used to measure the single-factor construct of Fan identification (FanId) adopted from Wann and Branscombe (1993).

The questionnaire consisted of three segments - the first included questions relating to general socio-demographic information about respondents and their activities as football fans. In the second, respondents had to express their level of agreement with statements related to SSTR components. The third part included items from the fan identification scale, where participants had to express their agreement (or assess importance) with related statements. Items used for SSTR and FAN id were measured on a 6-point Likert scale ranging from 1 (completely disagree/very unimportant) to 6 (completely agree/very important). In order to delineate sub-groups of fanatical fans based on their perceptions of team reputation, new variables were defined based on mean values of SSTR dimensions. Previously, internal consistency was checked, showing acceptable Cronbach alpha coefficients (above 0.75 for all six components).

For this study, a link to a questionnaire was distributed in three closed Facebook groups during March and April 2022, gathering the most ardent and aggressive fans of one of Croatia's most famous football clubs. The questionnaire was hosted on the Qualtrics XM website. In total, 291 respondents participated in the survey, with 16 excluded from further analysis due to incomplete questionnaires. Thus, the final sample size was 275.

Data analysis was performed using the SPSS software package, using non-parametric (Mann Whitney and Kruskal Wallis) tests due to the nature of scales used in data collection. In addition, the Decision tree technique was used to classify participants based on specific elements of their behavior.

3. RESEARCH RESULTS

Research results show a predominately male population in the sample (72.9% of 275 participants). Due to the nature of the fans included in the sample (primarily fanatic and dysfunctional fans), such a structure was expected. Most participants are 18 to 34 (70.4%), with only 1.4 % falling into the 55 or older category. Additionally, the majority (70.5%) are of lower or middle economic status, with 16.5% at risk of poverty (personal income less than 500 EUR monthly).

Responses and descriptive for SSTR items (mean and standard deviation for all items and means for aggregate variables representing SSTR components) are shown in Table 1.

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Table 1. Sports team reputation perception descriptive

Spectator-based sports team reputation (SSTR)	N	Mean	SD
TEAM PERFORMANCE (TP)		**4.12**	
TP 1 Hajduk has very quality players	275	4.68	0.699
TP 2 Hajduk's players provide excellent games	275	3.86	0.783
TP 3 Hajduk's game is outstanding	275	3.69	0.883
TEAM TRADITION (TT)		**5.81**	
TT 1 Hajduk is a club with a long history	275	5.78	0.585
TT 2 Hajduk is a club with a rich history	275	5.81	0.436
TT 3 Hajduk's long and rich history makes it special today	275	5.75	0.555
SOCIAL RESPONSIBILITY (SR)		**4.34**	
SR 1 Hajduk players help the local community in Split	275	4.13	0.768
SR 2 Hajduk donates to humanitarian foundations	275	4.64	0.846
SR 3 Hajduk regularly donates to the local community	275	4.21	0.814
SPECTATOR ORIENTATION (SO)		**5.01**	
SO 1 Hajduk takes care of its fans	275	4.88	0.855
SO 2 Hajduk takes the rights of its fans seriously	275	4.83	0.994
SO 3 Hajduk treats its fans with respect	275	5.16	0.777
MANAGEMENT QUALITY (MQ)		**4.48**	
MQ 1 The management of Hajduk has a clear vision of the club's future	275	4.67	0.85
MQ 2 The management of Hajduk is outstanding	275	4.25	0.912
MQ 3 The management of Hajduk manages the club excellently	275	4.45	0.902
FINANCIAL SOUNDNESS (FS)		**3.23**	
FS 1 Hajduk is doing well financially	275	3.73	0.847
FS 2 Hajduk has been a profitable club for many years	275	3.27	1.099
FS 3 Hajduk is financially more successful than other clubs	275	3.15	1.006
Valid N (listwise)	275		

Source: Research

Respondents perceive Hajduk as a club with a great tradition (M=5.81), cultivating a relationship with its fans (M=5.01). They are aware of the financial problems in the club (M=3.23), but they believe in the quality of the management (M=4.48). Their perception of the team's performance is not good, while simultaneously, there is the perception of Hajduk having very good players (M=4.12). Finally, it is intriguing that this cohort of fans believes that the club shows a relatively satisfactory level of social responsibility (M=4.34) toward the local community.

Fan identification descriptive are shown in Table 2.

Table 2. Fan identification perception descriptive

Fan identification (FAN ID)	N	Mean	SD
FAN ID 1 How important is it to you that Hajduk wins?	275	5.25	1.089
FAN ID 2 How big of a Hajduk fan do you consider yourself to be?	275	4.97	1.093
FAN ID 3 How big of a Hajduk fan do your friends consider you to be?	275	4.78	1.270
FAN ID 4 During the season, how regularly do you follow Hajduk via any of the above methods (by going to matches, via Internet stream services, TV, newspapers, radio, portals…)	275	5.00	1.251
FAN ID 5 How important is it to you to be a fan of Hajduk?	275	5.13	1.189
FAN ID 6 What is your opinion about Hajduk's rivals (other clubs in the league)?	275	2.14	1.074
FAN ID 7 How often do you display Hajduk symbols at home, on your clothes, vehicle, or at your job?	275	3.91	1.539
Valid N (listwise)	275		

Source: Research

The results in Table 2 show that the identification with the team among fanatic and dysfunctional fans is extremely high (from M= 4.78 to M=5.25). As expected from this fan group, respondents perceive the rivals negatively (M=2.14). A somewhat surprising finding is that they do not display the club's symbols to a large extent (M=3.91).

In order to investigate the relations between sports team reputation perceptions (SSTR) and Fan identification (FanId), participants were divided into three groups based on exhibited perceptions of the SSTR dimension. The criteria for the grouping was mean value with groups defined as follows: Group 1 (negative perception of SSTR) consists of participants with a mean value ranging from 1 to 2.50, Group 2 (neutral perception of SSTR) consists of participants with a mean value ranging from 2.51 to 4.5, and Group 3 (positive perception of SSTR) including respondents with a mean value ranging from 4.51 to 6.

Since the normality assumption of data was violated, the following tables descriptive of FanId for three groups based on sports team reputation perception components are shown, with additional analysis of statistically significant differences (Mann Whitney U test or Kruskal-Wallis H rank-based nonparametric test).

Differences in FanId values between groups based on the Team performance component (TP) of the SSTR are shown in Table 3. Since there was only one participant in group 1 (negative), the Mann-Whitney U test was used to determine if there were statistically significant differences between groups with neutral and positive TP perceptions. Results show no significant difference, and, according to descriptive, the group with positive TP perception has the highest means for all FanId items (including ID 6 as an inverse item).

Table 3. Descriptive and Mann Whitney U test significance results for SSTR groups based on TP

TEAM PERFORMANCE (TP)	Negative TP perception (N=1)		Neutral TP perception (N=231)		Positive TP perception (N=43)	
	Mean	SD	Mean	SD	Mean	SD
FAN ID 1 Mann-Whitney sig.= 0.273	5.00	-	5.23	1.078	5.37	1.047
FAN ID 2 Mann-Whitney sig.= 0.058	3.00	-	4.98	1.023	5.26	1.002
FAN ID 3 Mann-Whitney sig.= 0.168	2.00	-	4.80	1.203	5.07	1.100
FAN ID 4 Mann-Whitney sig.= 0.212	3.00	-	4.98	1.249	5.26	1.026
FAN ID 5 Mann-Whitney sig.= 0.095	3.00	-	5.15	1.118	5.35	1.232
FAN ID 6 Mann-Whitney sig.= 0.312	3.00	-	2.13	1.026	2.00	1.091
FAN ID 7 Mann-Whitney sig.= 0.385	2.00	-	3.92	1.506	4.12	1.546

Source: Research

Analysis for differences among groups based on Team tradition perception was not conducted since all participants belong to the group with positive TT component perception. Descriptive of TT component perception are already presented in Table 1, and it is not unexpected due to sample characteristics. Since all participants are extremely loyal (not to say fanatics) to the Hajduk football team, one could expect a Team tradition of great importance and one of the critical criteria for identification with the club. Accordingly, no other definite conclusion can be made for the role of this particular component in FAN identification based on data.

Differences among groups in FAN id based on the Social responsibility component are shown in Table 4. Like Team performance perception, group 1 (negative) consists of only one participant. Therefore, the Mann-Whitney test was used to determine significant differences, excluding Group 1 from further analysis.

Table 4. Descriptive and Mann-Whitney test results for SSTR groups based on SR

SOCIAL RESPONSIBILITY (SR)	Negative SR perception (N=1)			Neutral SR perception (N=193)			Positive SR perception (N=81)		
	M	SD	Mean rank	M	SD	Mean rank	M	SD	Mean rank
FAN ID 1 Mann-Whitney sig.= 0.000; U=5337; Z = -4.587	6.00	-	-	5.09	1.128	124.65	**5.63**	.813	168.11
FAN ID 2 Mann-Whitney sig.= 0.030 U=6590.5; Z = -2.171	3.00	-	-	4.94	1.049	131.15	**5.22**	.935	152.64
FAN ID 3 Mann-Whitney sig.= 0.025 U=6539; Z = -2.241	2.00	-	-	4.74	1.236	130.88	**5.10**	1.032	153.27
FAN ID 4 Mann-Whitney sig.= 0.000 U=4821; Z = -5.406	4.00	-	-	4.77	1.300	121.98	**5.62**	.734	174.48
FAN ID 5 Mann-Whitney sig.= 0.000 U=5350.5; Z = -4.565	2.00	-	-	5.02	1.161	124.72	**5.59**	.932	167.94
FAN ID 6 Mann-Whitney sig.= 0.017 U=6453; Z = -2.393	2.00	-	-	2.18	.963	144.56	**1.96**	1.188	120.67
FAN ID 7 Mann-Whitney sig.= 0.000 U=4780; Z = -5.171	3.00	-	-	3.64	1.458	121.77	**4.67**	1.405	174.99

Source: Research

Results of the analysis show that respondents with a positive SR perception have the highest mean value for all FanId items. The results of the Mann-Whitney U test show that in this fan cohort, fans with a neutral perception of the SR compared to those with a positive perception show a statistically significant difference in the ranks of all seven FanId items.

The next SSTR component taken into consideration is Spectator orientation (SO). Analysis of the data is shown in Table 5. As can be seen from the results, there are no respondents with negative SO perceptions. Differences in mean values between groups are relatively small, with generally higher values observable in groups with neutral SO perceptions.

Table 5. Descriptive and Mann-Whitney test significance results for SSTR groups based on SO component

SPECTATOR ORIENTATION (SO)	Negative SO perception (N=0)			Neutral SO perception (N=49)			Positive SO perception (N=226)		
	M	SD	Mean rank	M	SD	Mean rank	Mean	SD	Mean rank
FAN ID 1 Mann-Whitney sig.= 0.896	-	-	-	5.27	1.095	-	5.25	1.068	-
FAN ID 2 Mann-Whitney sig.= 0.766	-	-	-	5	0.979	-	5.02	1.041	-
FAN ID 3 Mann-Whitney sig.= 0.949	-	-	-	4.86	1.155	-	4.83	1.212	-
FAN ID 4 Mann-Whitney sig.= 0.001 U=4005; Z =-3.276	-	-	-	5.47	1.023	169.27	4.92	1.243	131.22
FAN ID 5 Mann-Whitney sig.= 0.202	-	-	-	5.31	1.122	-	5.15	1.147	-
FAN ID 6 Mann-Whitney sig.= 0.424	-	-	-	1.98	0.924	-	2.14	1.057	-
FAN ID 7 Mann-Whitney sig.= 0.010 U=4268; Z =-2.563	-	-	-	4.45	1.43	163.90	3.83	1.511	132.38

Source: Research

Mann-Whitney U test results (see Table 5) show that, between fanatical and dysfunctional fans who display a neutral perception towards SO, compared to those who have a positive perception of the team's orientation towards specta-

tors, there is a statistically significant difference in the ranks of the fourth and seventh item of FanId, that can be related to specific spectator behavior.

Analysis of the Management quality (MQ) component of the SSTR construct was conducted using the same methodology described in previous steps. The results of the analysis are presented in Table 6. These results reveal the highest mean values for all FanId items among the group with neutral MQ perception. While these differences are relatively marginal, they are nevertheless significant (based on the Kruskal Wallis test) for the first, third, fourth, and fifth items of the FanId scale. Hence, fans with neutral perceptions of an SSTR dimension display the highest FanId scores.

Table 6. Descriptive and Kruskal Wallis test significance results for SSTR groups based on MQ

MANAGEMENT QUALITY (MQ)	Negative MQ perception (N=3)			Neutral MQ perception (N=128)			Positive MQ perception (N=144)		
	M	SD	Mean rank	M	SD	Mean rank	M	SD	Mean rank
FAN ID 1 Kruskal Wallis sig.= 0.015 χ^2=8.447; df=2	3.00	1.000	18.67	**5.35**	0.919	140.48	5.22	1.148	138.28
FAN ID 2 Kruskal Wallis sig.= 0.054	3.67	0.577	-	5.09	0.951	-	4.97	1.084	-
FAN ID 3 Kruskal Wallis sig.= 0.018 χ^2=8.003; df=2	2.67	0.577	22.83	**4.97**	1.064	144.14	4.76	1.275	134.94
FAN ID 4 Kruskal Wallis sig.= 0.026 $\chi2$=7.302; df=2	3.00	1.000	31.17	**5.14**	1.070	143.74	4.94	1.316	135.13
FAN ID 5 Kruskal Wallis sig.= 0.027 χ^2=7.251; df=2	3.33	0.577	27.33	**5.27**	1.023	140.82	5.13	1.219	137.80
FAN ID 6 Kruskal Wallis sig.= 0.417	2.67	0.577	-	2.06	0.970	-	2.15	1.097	-
FAN ID 7 Kruskal Wallis sig.= 0.088	2.00	1.000	-	4.02	1.433	-	3.91	1.569	-

Source: Research

Finally, the last component of the SSTR construct for which the analysis has been performed is the club's Financial soundness (FS). The results of the analysis are presented below in Table 7.

Table 7. Descriptive and Kruskal Wallis test significance results for SSTR groups based on FS

| FINANCIAL SOUNDNESS (FS)	Negative FS perception (N=81)			Neutral FS perception (N=181)			Positive FS perception (N=13)		
	M	SD	Mean rank	M	SD	Mean rank	M	SD	Mean rank
FAN ID 1 Kruskal Wallis sig.= 0.000 χ^2=35.532; df=2	4.58	1.431	98.69	5.52	0.727	152.98	**5.77**	0.439	174.46
FAN ID 2 Kruskal Wallis sig.= 0.000 χ^2=30.548; df=2	4.42	1.244	100.13	5.24	0.814	152.14	**5.54**	0.66	177.12
FAN ID 3 Kruskal Wallis sig.= 0.000 χ^2=34.328; df=2	4.11	1.423	97.33	5.11	0.96	153.34	**5.46**	0.66	177.85
FAN ID 4 Kruskal Wallis sig.= 0.000 χ^2=20.792; df=2	4.44	1.508	108.41	5.22	1.009	148.22	**5.69**	0.63	180.12
FAN ID 5 Kruskal Wallis sig.= 0.000 χ^2=44.919; df=2	4.43	1.369	93.91	5.46	0.885	154.42	**5.85**	0.376	184.12
FAN ID 6 Kruskal Wallis sig.= 0.026 χ^2=7.277; df=2	2.37	1.123	156.22	2.02	0.989	131.54	**1.77**	0.832	114.38
FAN ID 7 Kruskal Wallis sig.= 0.000 χ^2=21.111; df=2	3.31	1.61	106.67	4.16	1.403	148.66	**4.85**	1.068	184.81

Source: Research

It is noticeable from the results that the group exhibiting positive FS perceptions is the smallest one (N=13). On the other hand, mean values for all FanId items are highest for that particular group, with results of the Kruskal Wallis test indicating statistically significant differences in the ranks of all FanId items across groups observed.

To determine if SSTR components can be used as a predictor of fans' behavior, the decision tree method of classification for two behavior elements: club membership and season ticket holding, was used. In both cases, the classification of spectators into homogenous groups, based on SSTR components as independent variables, was performed using Chi-square Automatic Interaction Detection (CHAID) growing method, with the size of the parent node set at 40 cases and the size of child node set on 15 cases. Club membership and season ticket holders (possible values were yes and no for both variables) served

as dependent variables, each in separate models presented below (see Figures 1 and 2).

Figure 1. Decision tree of club membership regarding SSTR components perception
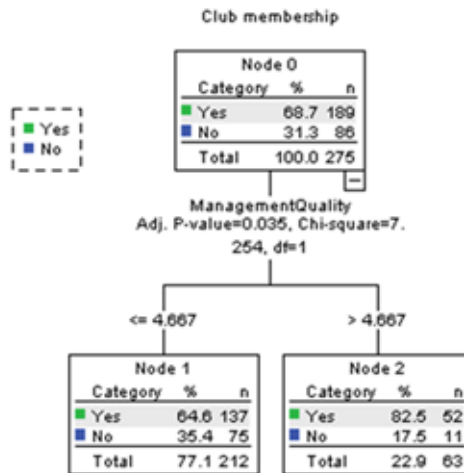
Source: Research

Figure 1 (Node 0) shows that the club members are a larger group (68.7%). Management quality (MQ) was the sole factor included, and classification was conducted in one node (due to only one significant factor for classification). Although MQ is perceived as high in the entire sample and the breaking point for classification is set at a relatively high mean value (4.667 on a scale from 1 to 6), it is clear from child nodes that there is a higher percentage (82.5%) of Club members in Node 2, perceiving MQ higher than 4.667, than in Node 1 (64.6%). It can be argued that, in this particular population where fans are partially involved in club management, they could be expected to evaluate their management performance as successful. Still, differences in this perception (although at high values) can be used to recognize predictors of specific fan behavior that club membership indeed is. The risk assessment or probability of false classification for the proposed model is 0.313 with a standard error of 0.028, meaning that the risk of false classification of club members using SSTR components perception is 31.5%.

Figure 2. Decision tree of season ticket holder regarding SSTR components perception
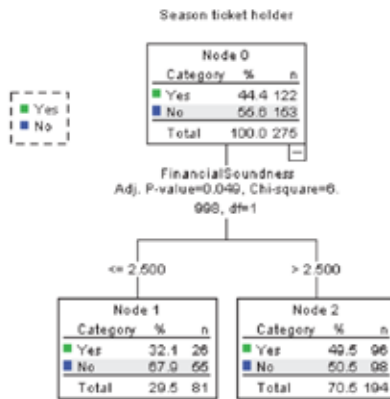
Source: Research

Figure 2, using the same procedure and criteria, presents a classification for Season ticket holders as the dependent variable. In this case, a group without a Season ticket is more prominent (55.6%), and the only significant factor for classification from all SSTR components is Financial Soundness (FS). Most participants in all nodes are not season ticket holders, with the highest percentage in Node 1 (67.9%), where FS is perceived as less or equal to 2.5 out of 6. It should be noticed that the perception of FS classifies the sample on a relatively low value, with the highest percentage of season ticket holders in Node 2 (49.5%). The risk assessment for this model is higher than in the previous (0.444, standard error 0.030), so the risk of false classification of Season ticket holders using SSTR components perception is 44.4%.

While initially, one might conclude that the results of this classification are not following the previous one, it could be argued that they resonate with the specific cohort included in the research. Namely, as previously indicated, fans who indirectly participate in management-related decisions and who are simultaneously perceiving the financial situation of the club as poor might be more reluctant to 'invest' their money into the club through the purchase of season tickets when compared with the fans who see the financial situation as positive (or at least not as harmful). To summarize, the two presented models indicate that fans' behaviors in the analysis do not share the same predictors. Therefore, action planning and fans-oriented strategies must be observed separately based on desired outcomes derived from fan behavior.

4. CONCLUSION

This paper aimed to examine the interrelation between elements of sports team reputation as defined through the SSTR model with fan identification. Additionally, the ability to predict selected behavioral outcomes based on perceptions of team reputation were tested. Participants were recruited from a group of fanatical and dysfunctional fans who constitute the most stable fan base in most football clubs. Simultaneously, these fans participate in fan groups that directly influence some aspects of team management. While this cohort might not be the most attractive from the perspective of "modern football" advocates, they constitute the foundation for all fan-related activities in more minor and commercially less attractive leagues. Hence their perceptions and attitudes towards various aspects of the club performance and management need to be taken into account and considered in developing marketing strategies for football clubs.

The study's findings show that interrelations between SSTR and FanId are observable on specific dimensions of SSTR. While interpreting some of those interrelations is fairly straightforward (e.g., participants who identify higher with the club perceive it as being more favorable in terms of the Social responsibility component of the SSTR, which would be expected), some are more intriguing.

Namely, fans with neutral perceptions of Spectator orientation (SO) show significantly higher regularity of following the team through participation and media and displaying club symbols in everyday life. Although this finding might sound counterintuitive at first sight, one potential explanation could lie in the fact that fans who are more critical in terms of the treatment of fans by Hajduk's management are at the same time more committed in terms of behavioral outcomes (match attendance, media coverage and showing their allegiance in everyday life). Such behavior would fit well with the expected characteristics of the fan cohort included in this study.

A similar pattern is observable with the MQ (Management quality) element of the SSTR – neutral perceptions of the MQ are linked with (marginally, but significantly) higher FanID. Once again, it could be argued that higher fan identification will be linked with a higher tendency towards more critical evaluations of team reputation dimensions. One specific aspect of this study when discussing MQ perceptions is that fans included in the sample are members of

supporter-based groups that participate in managing the team through various mechanisms. Hence, this particular group is likely to be somewhat less critical of the management than supporter groups that do not participate in decisions related to the club's management selection.

Regarding the perception of FS (Financial soundness), fans with positive and neutral perceptions simultaneously have the highest FanID scores. These results can again be interpreted in the light of respondents from the segment of fans who are directly involved in selecting club management. Thus it could be expected that they would be more positive in their perceptions of management-related aspects of SSTR than the other fans.

The results of this study reveal several exciting findings discussed in the previous text, which can be interpreted in light of the idiosyncrasies of the sample included in the research. Namely, members of the sample are fanatical and dysfunctional fans who are, at the same time, through fan clubs, directly involved in participatory decision-making related to the management of the club. Interpreting findings in light of this fact opens routes for future exploration of dynamics of fan participation in club management and perceptions of team performance, particularly in light of how attribution mechanisms would function in this context.

Finally, some limitations of the study need to be recognized. While the sample size is substantial, the purposive nature of the sample limits the ability to cover a variety of fan characteristics. Although this study manages to reach a particular group of supporters – fanatics and dysfunctional fans, the fact that all respondents were recruited among members of fan groups involved with club management likely skews answers related to dimensions of perceived club reputation related to club management topics. The question of fans' ability to judge management actions impartially when they have participated in the management selection process is legitimate and should be addressed by including more impartial fans in future studies. Furthermore, due to the mode of respondent recruitment, there is a high potential for self-selection bias. Finally, while the survey was anonymous, some of the answers' potential for social desirability must be recognized. An additional limitation is that fans of only one football club were included in the research. Hence, future studies should aim to reach a wider set of football fanatic fans (e.g., members of other clubs' fan groups).

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THE INFLUENCE OF DIGITAL TRANSFORMATION ON SPORTS ORGANIZATION MANAGEMENT IN THE REPUBLIC OF CROATIA

Tvrtko GALIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Kinesiology Osijek

E-mail: tvrtko.galic@gmail.com

Abstract

This paper aims to determine the influence of digital tool use in the day-to-day management of sports organizations.

An online survey was conducted to provide answers as to the extent to which sports organizations use digital tools in activities such as records of members and membership fees, the use of the internet as a logistic tool for purchasing essential equipment, but also for the sale of products and services of the sports organization.

On a sample of 218 sports organizations of the first category in all 18 cities in the Republic of Croatia with over 30 000 inhabitants, an online questionnaire was set up to detect the level of digital transformation of an individual sports organization and the connection of the level with sports and business success.

The question that arises through further reflection may also refer to the same effect of using digital tools. Any tool, including the digital one, is ineffective without its timely and adequate application. It follows from this that in addition to possessing competencies in using a particular tool, it is necessary to know the business process itself, sports marketing and all business segments of a sports organization. The paper also emphasizes the benefits of using specific digital tools for particular business segments in sports organizations. It emphasizes the necessity of their recognition by the management structures of sports organizations.

The results of the Kruskal-Wallis Anova test indicate statistically significant differences between the groups in seven questionnaire items. Kruskal-Wallis H

ranged between H = 46.50 and 68.65. There was no statistically significant level between the observed three sample groups in the two questionnaire items.

In future research on this issue, it is desirable to include lower-categorized clubs and, if possible, expand the sample to all cities in Croatia. The hope for future research is to compare the level of digital transformation of clubs in the surrounding area with clubs in Croatia. The research showed the positive connection of digital transformation with the sports and business success of sports organizations. It once again emphasized the necessity of digital transformation in the management of sports organizations.

***Keywords:** sports management, digital tools, digitalization of sports*

1. INTRODUCTION

The importance of digital tools in everyday life is unquestionable. The digital transformation of all segments of life has wholly entered our society, including sports. In that regard, sports organization management has also been going through a phase of digital transformation. Day-to-day management of sports organizations is undoubtedly a challenge for people in charge since proper sports organization management requires having economic competencies and knowing the basics of the organization's sport and how it works. On the other hand, the digital transformation of all social segments, sports organizations included, enables the use of new digital tools in everyday operations. Digital tools aim to increase the productivity of sports organizations, thereby increasing their management's efficiency. This means that sports organization managers today must be competent in using digital tools to remain concrete in the market or to find advantages over the competition. Digital technologies appear promising for organizational development in nonprofit sports organizations (Ehnold et al., 2020).

Further from the management field, design thinking arises as a suitable means of pursuing the human-centered generation of value for the user (Joachim et al., 2021). The range of digital tools available to sports organizations is extensive and can be applied to various business segments. Those segments may refer to the organization of sporting events, sports facilities management, marketing management, financial management, membership management or participation

in the training process through analytical support through different digital devices. This paper will address digital tools' influence on day-to-day sports management activities. This implies the most iterative activities, from member and membership fee record-keeping and fan management to purchase or sales of certain products. When discussing the digital transformation of sports organization management in the general sense, it is important to stress that digital transformation can be divided into several levels, each building upon the preceding one. The initial level is related to the infrastructure that sports organizations must have to be able to use digital tools. The next level is related to communications since it includes no complex tools and emphasizes communication with the membership and the public. This paper will explore the applicative level of digital transformation, which is, in the authors' opinion, in the middle of the divide, and it is considered that organizations with a high level of digital tool usage at this level have good preconditions for a quality digital transformation and maximization of the impact of digital tools. The applicative level is followed by the analytical one, where the emphasis is on the analytical approach to the data collected at the applicative level. The highest level is the integrated one, applying digital tools in the training process to improve the organization's sports segment.

2. THEORETICAL FRAMEWORK

When discussing the use of information and communication systems (ICS) in sports, priority should be given to analyzing which information sports organizations need in their work so that their management can make the right decisions, when they are needed, and how sports organizations collect the data for processing. Due to globalization, the market is constantly expanding, and the competition is getting stronger each day, so survival is becoming a challenge. The proliferation of digital technology has stirred radical transitions which impacted the professional sports industry. In information and communication terms, because of harsh competition, sports organizations face massive amounts of data that need to be processed due to the growing number of daily decisions that sports organization management needs to make (Zheng & Mason, 2022).

By 2030, technology will significantly impact all three user groups in sports: athletes, consumers, and managers (Frevel, Beiderbeck & Schmidt, 2022). So, technology is becoming one of the most critical factors driving the international

competitiveness of the sports industry. Increasingly the sports industry is requiring the use of technology in order to facilitate performance improvements (Ratten, 2020).

Specific authors define information systems through structures with several connected elements or several parts, each in charge of completing one of the defined goals. One of the main challenges of digital marketing is the lack of customer access to products and services in person, directly and tangibly (Budovich, 2021).

Looking at ICSs in sports in terms of the scope of the information they process, that is, the level they encompass, an individual competitive category within a sports organization or a sports competition can be thought of as the smallest organizational unit. Further, ICS can be discussed at the level of a sports association and its structure. Accordingly, the highest ICS in a given sport is the system of the international organization in charge of that sport. It is also imperative to emphasize the existence of national or central information and communication systems, as well as those of individual sporting events.

ICSs at the level of a sports organization certainly have the most significant influence on the development of a sport in terms of its administration and management. For this paper, we can highlight two basic types of information, and thereby two basic information and communication systems: ICS for sports segment management and ICS for business segment management.

An ICS for sports performance management enables the governing structures in charge of sporting results to monitor the development of the entire team and every individual, to follow their performance, form, deviations compared to others, and their physical predispositions, and thus make decisions that will yield optimal results. Due to technology's expanding role in people's daily lives, it is necessary to explore consumers' readiness to use technology-based products and services (Parasuraman, 2000; Parasuraman & Colby, 2015).

ICS for business segment management enables sports organizations' administrative and management bodies to have better control over finances, better resource planning, mutual communication, better customer or fan relationship management, and several digital tools available to sports organizations. Sports organizations as social enterprises simultaneously seek sporting, economic, and social results. ICT can increase the value of fans as assets, reinforcing the integration of these three forms of results (Ruta et al., 2013). They also essentially

facilitate the organization of sporting competitions and events. Sports organizations increase their productivity and efficiency, emphasize information technology and make it proportional to the organization's needs (Mohamed, 2018).

For instance, a ticket sales management system can make selling tickets for a sports event much more accessible. For this purpose, specialized ICSs have been developed to enable online ticket sales and maintain records of tickets sold and those who purchased them. These ICSs allow buying a ticket without physically visiting a point of sale. In addition to individual sporting event tickets, sports organizations can delegate the sales of their season tickets to specialized digital platforms. Esports exemplify the growing number of digital innovations influencing organizations' operations (Pizzo et al., 2022).

The systems for club membership management and members' activities in the sports organization are critical. This provides timely information on all activities of individual members, including their financial statuses and any debts against the sports organization. Collecting all the financial data on members in a given period enables more efficient management of a sports organization's budget, planning activities concerning current cash flow and other activities resulting from this. By such regularly updated records, the sports organization reduces the possibility of a loss of revenue due to inaccurate or untimely records of revenues earned. Sports organization management via digital tools has made such progress that specialized companies now provide software solutions to sports organizations, facilitating their sports content, membership fee or member management. Digital technologies make sports watching more inclusive, providing "more angles to the diversity" (Glebova et al., 2022).

In the presented examples, the ICSs in sports organizations are primarily intended for easier management of the sports organizations and their further development. ICSs at the level of individual sports associations are primarily tasked with ensuring the regularity of competitions. This implies keeping accurate records of participants, the competition schedule, the officials and the accurate and timely records of the results achieved in a given competition during and after the competition. The implementation of technological innovations has revolutionized the way sports are played by athletes, viewed by consumers, and monetized and regulated by management (Dukić et al., 2022). Digital transformation of systems facilitates the management of the primary data on each competition participant, including keeping paper-based files in digital

form available at any given moment to persons requiring them. This accelerates and facilitates administrative work, realizing long-term financial savings.

Similar to ICSs in individual sports at the national level, international umbrella associations keep the records of the participation rights of individual athletes as representatives of their respective countries, the records of the total number of athletes in an individual sport per country and monitor the development of the sport through available digital tools.

Organizing any competition today, local or international, is impossible without using digital technologies. The higher the level of organization, the greater the complexity of the set of digital tools necessary to carry out the competition. For example, when organizing a world championship in a sport, such digital systems must be provided to enable commentators to see match statistics, communication systems for image processing must be provided to media companies, the organizers need an internal communication system, a check-in system must be in place for registration of the arriving participants, personal records, accommodation records and records of all the participant's scheduled activities. Alongside the mentioned ticketing systems, a separate system must be set up for processing the competition results, and, depending on the sports, unique digital technology to determine the competition's winner, such as athletics timing systems or video support for referees in specific football competitions.

It is also important to mention some information and communication systems in sports at the national level. In the Republic of Croatia, a system of central records and registers of all athletes is being developed and implemented. Its complete application will significantly increase the transparency of all sports and sports organizations. This will lead to a better and fairer distribution of public funds for sports organizations in the Republic of Croatia. For instance, by introducing the personal identification number and linking it to certain government institutions' systems, the administration's transparency has increased, and funds have also been preserved. By linking the personal identification number with the tax administration, all reported revenues of every citizen are visible and easily comparable with their registered assets, which can also be verified via personal identification number.

On the other hand, the digital transformation of public administration has made certain documents available to citizens via digital tools without wasting time and money physically visiting government institutions. Such examples

shine a light on the necessity of a unified register of all athletes and sports workers to quantify in a positive context all the activities of sports organizations and national sports associations, thus creating preconditions for preventive health activities of all citizens of the Republic of Croatia. On the other hand, growing "digital exclusion" is another concern: the greater dependency on technical means excludes certain parts of the population, unable to use them for different reasons (Rovinskaya, 2021).

Customer relationship management has only been introduced as a strategy in recent years in sports organizations since the very concept of sports organization management has primarily changed. The shift of focus in sports organization management has been directed toward the customers and members of a sports organization. This means that sports organizations started to pay more attention to the needs of their members, sympathizers and fans, and by monitoring their relationship with the sports organization, they were able to adapt their approach to end customers, that is members and fans.

New technologies mean that sports clubs and governing bodies are generating more data than ever to help manage their relationship with fans, performance, and income streams. Winning with data in the sports business, the key developments are three-fold: new technology, a new understanding of how to apply that technology, and the new laws informing and controlling the data generated from the technology (Green, 2021).

Since the above definition of CRM focuses on the consumer, it cannot be entirely accepted, as it is vital to emphasize that the customer is the focus of every business entity. The reason for such a conclusion is that the buyer, the person we directly sell the product to, is not also the end user of our product, i.e., the buyer can be one person, and the consumer is someone entirely else. For every business organization's market approach, including those in sports, the needs and habits of both groups must be considered. This claim can be explained by the example of a sports organization working with preschool and primary school children. While the children are the actual consumers of the services the sports organization organizes for them, it can by no means neglect the needs and habits of the buyers, in this case, the parents who finance their children's sports activities. Parents provide their children transportation to sports events, such as training sessions or competitions. In such cases, the sports organization must not ignore the parents' characteristics, as they are the critical logistic factor

enabling the consumer, i.e., the child, to consume what the sports organization prepares for them.

Relationship management with all customers, rather than just consumers, helps a sports organization to get to know all the participants in market processes more closely, thus maximizing the satisfaction of all. The above example of preschool children as consumers who take up sports activities at a sports organization and their parents as the actual buyers, because they are in charge of transportation, equipment purchase, membership fee payments, and attendance of sports activities can be further elaborated on by examples of CRM application. Since the parent takes the child home after the activity, sports organizations must consider how parents can spend the waiting time in a quality manner.

All of the figures above clearly indicate that it is vital for a sports organization to have the best relationship possible with its customers.

Digital technologies facilitate customer relationship management since they make more accessible the input, processing and subsequent analysis of all relevant customer information. For sports organizations, this relevant information can cover a broad spectrum, but for this chapter, the key ones are given here:

- Number of members of the sports organization
- Number of sympathizers and fans of the sports organization
- Demographic and geographical structure of all participants (members, sympathizers, fans)
- Stand-out features of the sports organization as seen by its fans
- Satisfaction with individual activities
- Activities seen as unfavorable by sympathizers, fans and members
- How big is the consumption of each participant in the market
- Financial, administrative, temporal and other resources invested by the sports organization in its members
- Characteristics of individual activities organized by the sports organization (popularity, number of members participating in an activity, attendance etc.)

By analyzing the data obtained by the customer relationship management strategy, efforts can be made to establish why sympathizers do not become enthusiastic fans, that is, what factors fans appreciate the most or least about their club. By making correct decisions based on that information, the number of

sympathizers turned fans can be increased. Therefore, we see evident changes in how audiences and workforces engage with sport, entertainment, and leisure (Lawrence & Crawford, 2018). However, we can conclude that the roles of digitization are different in enterprises with different ownership or industries (Ma & Li, 2022).

The above-listed ways information systems can affect a sports organization show that using information and communication systems in sports can create significant competitive advantages for sports organizations and the industry compared to other organizations operating in the leisure time market. It is necessary to improve the sports development environment, optimize the unfavorable factors of sports development, and overcome these obstacles to promote the development of the sports industry (Mu, 2022). Looking at the realistic requirements to be met by an ICS and the functions such a system should have, it needs to be defined how an ideal information system would look, one that would ultimately fulfill the tasks assigned to it by the governing structures of a sports organization.

In addition to having significant benefits for the sports organization, customer relationship management and digital technologies positively affect customers, meaning that positive effects arise for members, fans, sympathizers, and everyone else interacting with the sports organization. As seen in the example of sports organizations that organize sports activities for preschool children, the consumers are considered customers, but so are parents, who are buyers. If a CRM system allows two-way communication between the customer and the sports organization, the parent as a customer can view all their obligations toward the sports organization, check the schedule of all events that concern their child and thus keep up to date with all the relevant information. Depending on the level of sophistication of the CRM system, parents can be timely notified of required activities via e-mail and SMS messaging. This is helpful because they no longer need to keep track of their obligations toward the sports organization and can use their time for other activities. The preceding chapter discussed various types of communication that a sports organization could have with its members, which can also be seen as a specific type of application of a customer relationship management strategy since this creates long-term partnerships and increases the loyalty between the sports organization and its members, fans, and sympathizers. The increased global popularity of social media has led many

consumer brands to increasingly turn to consumer-to-consumer marketing methods in recent years (Geurin & Burch, 2017).

Different types of products can be efficiently distributed via online commerce. Moreover, differences in consumption preferences for sports products are strongly related to the consumer's age. Consumers representing Generations Y and Z are more open to new consumption models than Generations X and BB (Baby Boomers). That can be official jerseys and equipment, essential equipment, match tickets, books, photos and video material, and souvenirs (Leszczyński, Metelski & Rabczun, 2021).

Sports organizations typically use the hybrid model of e-commerce. It is a combination of traditional physical and online shopping. This means that sports organizations enable customers to purchase products in physical and online stores.

With online commerce, sports organizations have enabled their fans and members to shop regardless of location. Fans of a sports organization are those who physically attend its events and those who can watch their team compete live anywhere in the world via digital channels. Many of those fans are willing to pay to see their team compete. Because of that, the number of people paying to follow their team's measures is millions, compared to tens of thousands watching the competitions live on-site. By the same analogy, online commerce has allowed millions of fans worldwide to purchase the products sold by their club. In contrast, previously, they had to purchase (best case scenario) only several physical stores. Shoppers can purchase other products, such as scarves, t-shirts, hats, souvenirs, calendars, etc.

When discussing online stores in sports, it is essential to mention the sporting goods industry itself, which has made a significant step here. As already mentioned, perhaps the biggest advantage of online commerce is that shopping can be done anytime and anywhere with an internet connection. The sporting goods industry has recognized this fact, and launching online stores enabled customers worldwide to purchase its products. This has allowed customers to choose the most suitable products for their sports activities. A customer, such as an athlete, can now search for the equipment that fully meets their needs, with the possibility to compare products of different manufacturers. Customers can compare prices, which enables them to purchase the most affordable product.

Specialized companies have enabled online shopping for a wide range of sporting goods by various manufacturers.

As described in the theoretical part of the paper, the significance of digital tools for sports organizations is quite considerable, as well as the spectrum of the possibilities they offer.

It is also important to note the expansion of Esport. ESport represents a form of sportification and the association between eSport and various outcomes, including physical and psychological health, social well-being, sport consumption outcomes, and diversity and inclusion (Cunningham et al., 2017). Traditional sports leagues must innovate and embrace emerging trends to grow. At the forefront of these trends are the inherently digital esports –competitive video game competitions (Lopez et al., 2021). However, an overarching perspective on strategic management in eSports is still lacking (Flegr & Schmidt, 2022).

3. METHODS

The research sample included sports organizations in all 18 cities in the Republic of Croatia, with a population of over 30 000. The data on population sizes were obtained from the Central Bureau of Statistics website (Central Bureau of Statistics, 2012). The research was conducted from February to June 2019. Due to the above, the research sample encompassed first-category clubs or drivers of quality. If Category 1 has one or no teams at all because of the criteria, the sample in those cities included Category 2 clubs as well. There were 218 such sports organizations in the analyzed cities, which were included in the research sample.

Due to the examination of the reliability of the user survey, randomly chosen subsamples of eight cities were asked to fill questionnaire once again. The reliability of the indices observed through the coefficient of correlation was found to be statistically significant ($p<0.05$) and moderate to high ($p<0.79$-0.91). The arithmetic mean of the number of points, median modal values and the minimum and maximum result in each question for each sample group were calculated. Kruskal - Wallis ANOVA was used to determine the difference between the groups, and if the H level was significant, post – hoc multiple comparisons were used. All analyzes were performed with a significance level of $p < 0.05$.

Table 1: Sample structure by cities

No.	Location	Number (Share)	Population 2011
1	Bjelovar	4 (2.80%)	40 276
2	Dubrovnik	11 (7.60%)	42 615
3	Karlovac	7 (4.80%)	55 705
4	Kaštela	4 (2.80%)	38 667
5	Koprivnica	5 (3.40%)	30 854
6	Osijek	13 (9.00%)	108 048
7	Pula	6 (4.10%)	57 460
8	Rijeka	8 (5.50%)	128 624
9	Samobor	3 (2.10%)	37 633
10	Sisak	9 (6.20%)	47 768
11	Slavonski Brod	2 (1.40%)	59 141
12	Split	18 (12.40%)	178 102
13	Varaždin	5 (3.40%)	46 946
14	Velika Gorica	5 (3.40%)	63 517
15	Vinkovci	8 (5.50%)	35 312
16	Zadar	10 (6.90%)	75 062
17	Zagreb	21 (14.50%)	790 017
18	Šibenik	6 (4.10%)	46 332

The sample of respondents was divided into three subsamples (groups) according to the total number of points achieved. The first group (1st G) consisted of associations that scored up to 20 points out of 110 possible. The second group (2nd G) consisted of associations with 20-40 points, and the third group (3rd G) had more than 40 points.

Regarding the sample structure, it is essential to highlight it according to the number of members in the past season. Most of the responding sports organizations had up to 100 members, 44.10% of them, while 30.30% had between 101 and 200 members. This means that 74.40% of the surveyed sports organizations had up to 200 members.

The sports organizations covered by this research take up 30 different sports, and care was taken to represent every sport with more than 50%, i.e., for the sample to include at least 50% of the sports organizations from an individual city. The data requested from the respondents referred to the most recent completed year, i.e., the 2018 data were requested.

Table 2: Sample structure by sports

Sport	total sample number	realized	realized share in sport (%)	realized share in the sample (%)
Car racing	1	1	100	0.70
Baseball	1	1	100	0.70
Kickboxing	1	1	100	0.70
Rugby	1	1	100	0.70
Scuba diving	1	1	100	0.70
Diving	1	1	100	0.70
Cycling	2	2	100	1.40
Bocce	2	2	100	1.40
Weightlifting	2	1	50	0.70
Chess	2	2	100	1.40
Kayaking-canoeing	3	2	66.70	1.40
Wrestling	3	2	66.70	1.40
Sailing	6	4	66.70	2.80
Tennis	6	4	66.70	2.80
Futsal	6	4	66.70	2.80
Karate	6	4	66.70	2.80
Bowling	6	4	66.70	2.80
Taekwondo	7	4	57.10	2.80
Gymnastics	8	6	75.00	4.10
Table tennis	8	5	62.50	3.40
Rowing	8	6	75.00	4.10
Shooting	9	6	66.70	4.10
Water polo	11	8	72.70	5.50
Judo	11	7	63.60	4.80
Swimming	12	8	66.70	5.50
Athletics	13	8	61.50	5.50
Volleyball	17	11	64.70	7.60
Football	19	14	73.70	9.70
Basketball	21	11	52.40	7.60
Handball	24	14	58.30	9.70

The data were also collected through interviews with managing staff of the sports associations in the cities encompassed by the sample. In contrast, online surveys collected data on the sports organizations covered by the sample.

4. RESEARCH

Digital transformation research in day-to-day operations involves digital applicative tools, emphasizing the sports organization's organizational activities. Data will be shown on using separate digital tools when conducting organizational activities within a sports organization. To determine the overall applicative level of digital transformation, each answer was weight-averaged by a certain number of points.

Table 3 shows the descriptive parameters of each sample regarding the total number of points achieved in the questionnaire.

Table 3: Descriptive parameters of the first, second and third sample

	First sample (0 -20 points)			Second sample (20 – 40 points)			Third sample (40 – max points)		
	Mean	Median	Min - Max	Mean	Median	Min - Max	Mean	Median	Min - Max
1. How can future members (athletes) apply to your sports organization?	1.58	0	0-10	5.19	5	0-15	8.58	5	0-15
2. How does your sports organization record the list of members (athletes), their attendance at training and membership fees?	3.42	5	0-10	5.83	5	0-15	9.06	10	5–15
3. How do the members (athletes) of your sports organization have an insight into the calendar of activities of your sports organization?	2.11	0	0-5	6.20	5	0-15	10.85	10	0-15
4. How can your sports organization members see the records of their membership fees?	0.26	0	0-5	2.96	5	0-10	5.66	5	0-15
5. How can members (athletes) of your sports organization get the information needed to pay the membership fee?	0.00	0	0-0	1.85	0	0-5	4.43	5	0-15
6. How much do you use the Internet to find and buy equipment for your sports organization?	5.76	4	0-15	9.93	9	0-15	13.08	15	0-15
7. Is there a possibility to buy tickets online - one-time or seasonal?	0.00	0	0-0	0.56	0	0-10	2.08	0	0-10
8. Is there a possibility to buy any content of your sports organization online?	0.00	0	0-0	0.19	0	0-0	2.64	0	0-10

The Kruskal – Wallis Anova results show significant differences between the three subsamples regarding the total number of points achieved in all questions. Table 4. shows the interrelationships between the samples.

Table 4: Differences between groups concerning the number of points purchased

	Kruskal – Wallis H	P level	P level of multiple comparisons 1st–2nd group	P level of multiple comparison 1st–3rd group	P level of multiple comparison 2nd-3rd groups
1. How can future members (athletes) apply to your sports organization?	47.316	<0.001	<0.001	<0.001	<0.010
2. How does your sports organization record the list of members (athletes), their attendance at training and membership fees?	46.502	<0.001	<0.017	<0.001	<0.001
3. How do the members (athletes) of your sports organization have an insight into the calendar of activities of your sports organization?	68.650	<0.001	<0.001	<0.001	<0.001
4. How can your sports organization members see the records of their membership fees?	67.025	<0.001	<0.001	<0.001	<0.001
5. How can members (athletes) of your sports organization get the information needed to pay the membership fee?	48.663	<0.001	<0.011	<0.001	<0.002
6. How much do you use the Internet to find and buy equipment for your sports organization?	52.805	<0.001	<0.001	<0.001	<0.002
7. Is there a possibility to buy tickets online - one-time or seasonal?	12.500	<0.002	1.000	<0.275	<0.524
8. Is there a possibility to buy any content of your sports organization online?	23.181	<0.001	1.000	<0.095	<0.084

From all the obtained data, it can be concluded that sports organizations with a higher overall level of digital transformation score higher in each question.

Considering the method of registration of potential new members in the sports organizations, 94.5% of the sample preferred personal visits as a method of registration. The option to register via the sports organization's website was provided by 22.2% of the organizations. In comparison, the option to register with an e-mail address was provided by 65,6% of the sports organizations. Sports organizations are required to keep records of their members and ensure the accuracy of their data, which is why the methods by which they keep those records are highly relevant. 66.9% of the sample indicated they kept their mem-

bership records in Excel spreadsheets, specialized software was used by 30.3%, while paper-based methods were used by 24.8% of the responding sports organizations.

The use of the internet as a digital tool that can facilitate a sports organization's operations regarding equipment purchasing was also included in the applicative level of digital transformation. The respondents were given the Likert scale from 1 to 7, denoting the degree to which they used the Internet for purchasing equipment. The answer 7 meant they used the internet to purchase daily, whereas 1 meant they did not. 41.4% of the respondents stated that they used the internet daily for purchasing equipment, whereas 4.1% did not use it. More than half of the respondents 54,.5%, answered 6 and 7 to this question, which can be considered the high intensity of internet usage of equipment purchasing.

Regarding online ticket purchasing, only 9.7% of the responding sports organizations said they had such an option, whereas 15.9% said they did not. 74.5% said they did not charge tickets for their organized sports events. Further, 89.7% of the responding sports organizations did not have the option of online purchase for any of their contents that could be sold to realize extra revenue.

The overall applicative level of digital transformation was defined by summing up all the activities, which could have been awarded up to 110 points. 86.2% of the responding sports organizations had less than half of the maximum points, and none of the organizations had more than 90 points. The majority of the sports organizations, 39.3%, were in the range of 30 to 40 points, while as many as 71.1% were in the range of 20 to 50 points.

5. RESULTS AND DISCUSSION

The impact of ICT on the different socio-economic domains has been analyzed in several studies. Most focus on performance indicators, such as productivity, investment efficiency or organizational change (Delina & Tkáč, 2015). The diffusion of digital technology (for example, the increasing availability of high-capacity broadband networks and the proliferation of consumer-focused access devices) has changed the nature of innovation in the ICT sector (Santomier et al., 2016). The research on the applications that sports organizations use in their day-to-day management activities has shown that personal contact

still prevails among individual activities, while, in terms of the tools used, Office tools such as Excel are prevalently used for collecting and processing the data on members and membership fees. Two-thirds of sports organizations preferred using the Office tools. At the same time, less than a third were willing to use special computer programs, enabling much faster, more transparent, and more accurate data collection and processing. In terms of the methods of keeping records on members and membership fees, a significant amount of sports organizations use paper-based records in addition to digital ones.

Regarding new member registration, less than a quarter (22.1%) of the responding sports organizations enabled online registration through their websites. Looking at this in the context that 28.2% of the sports organizations did not have or use a website, this field has room for improvement. If we look at the management of sports facilities, the knowledge of such real-time data could allow facility managers to make control strategy decisions (Revel & Arnesano, 2014).

Low website usage is associated with the data obtained in the research that 89.7% of the responding sports organizations provided no options to purchase any of their contents online, the basis of which would be for the sports organization to have and use a website. Unfortunately, sports organizations still fail to see the opportunity to create revenue with such sales. Suppose a company implements an IT solution to enable customers to pay online, or to launch a sales auction. In that case, the perceived impact of ICT on revenue growth will probably be positive (Delina & Tkáč, 2015). In terms of internet use, more than half of the respondents used the internet daily or frequently to find and purchase the equipment needed for their operations.

The analysis of sports organization member data is closely related to the method of membership record keeping. The research has shown that two-thirds (66.9%) of the responding sports organizations used the Office tools to maintain membership data, while 41.4% stated that they analyzed the data using the same tools. A difference of 25.5% derives from this, that is, the one-third of those who record the data but do not analyze them with the digital tools that make this possible, without additional costs. It is essential to build on past knowledge, which today's computer technology can store successfully and use for better decision-making in the future (Tibaut & Zazula, 2018). The high rate of 40% of the responding sports organizations stating that they did

not analyze their membership data at all dwarfs even the 24.8% who kept their records manually. This leads to the conclusion that many sports organizations do not consider the analytical approach and adequate membership record-keeping. Viewed from the perspective of sports results, player evaluation is a critical component of the question-answering system in sports (Park et al., 2017).

6. CONCLUSION

Digital tool use in the day-to-day management of sports organizations is essential. Digital transformation, as a term that defines the use of digital tools for more efficient, safe, and transparent performance of all activities, is certainly well illustrated by the transformation of sports organizations' management. This transformation has been unfolding toward implementing various digital tools in daily operations. As confirmed by the research in this paper, sports organizations in the Republic of Croatia, which the research sample verified, use various digital tools in their operations. However, the level of it is still not satisfactory. The use of the internet as a sales tool has yet to become established, while, on the other hand, it is far more used as a purchasing tool. This may come from the fact that sports organizations have not yet fully developed product ranges. In the future, sports organizations must consider using specialized software to enable more accessible and efficient relationship management with their members, which is essential. This segment has an extremely high potential for advancement. Looking at this level of digital transformation in general, sports organizations in the Republic of Croatia have yet to complete it since, as the research has shown, most of the sports organizations included in the sample did not use even half of the digital tools discussed. Notably, no clear and transparent division of sports organizations in the Republic of Croatia regarding specific criteria exists. Therefore, each city's sporting communities have policies based on which they categorize their members. This is why future research should keep track of the progress of digital transformation, including all sports organizations, rather than just those in major Croatian cities. Future research should also be aimed toward analyzing the insights of sports organizations' governing structures on the effects and possibilities that digital tools provide them in day-to-day activities.

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IMPACT OF MARKETING CAMPAIGNS ON THE IMPLEMENTATION OF WASTE SORTING

Žarko STILIN, Ph.D.
University of Applied Sciences PAR

E-mail: stilin.management@gmail.com

Hrvoje KOGOJ
University of Applied Sciences PAR

E-mail: hrvoje.kogoj@cistoca-ri.hr

Vicko MUSTAPIĆ
PVC Troplex d.o.o.

E-mail: mustapic.vicko@gmail.com

Abstract

The main objective of marketing is finding successful methods, manners, and means for business entities to meet the interests and requirements of consumers with their business. Business in the 21st century is characterized as a marketing era with a strong focus on marketing. The fact is that today, with the aim of successful business, marketing must be carried out by both private and public companies. The purpose of this paper is the analysis the effectiveness of marketing campaigns in public utility companies. The subject of the research is a marketing campaign carried out continuously by the public utility company Komunalno društvo Čistoća d.o.o., the Department of the City Administration for Development, Urbanism, Ecology and Land Management of the City of Rijeka and the Department of the City Administration for the Public Utility System of the City of Rijeka. The marketing campaign aims to increase awareness of the importance of waste separation, inform users about waste collection from door to door and take care of the community. Data on the quantities and types of waste collected in 2020 and 2021 were analyzed, and surveys were

conducted among users of the services of the public utility company Komunalno društvo Čistoća d.o.o. The research concludes that the marketing campaign is highly effective. Many users continuously separate waste after the campaign, evidenced by the growth of collected waste. Moreover, the growth of waste sorting achieves the growth of user satisfaction. The results can be used to improve the marketing activities of public utility companies and raise public awareness of the importance of waste sorting.

Keywords: marketing, marketing campaign, the effectiveness of marketing, public utility companies, waste sorting

JEL Classification: M37, Q59

1. INTRODUCTION

Marketing is the foundation of success regardless of activity, size, ownership, and country of origin. The main objective of marketing is finding successful methods, manners, and means for business entities to meet the interests and requirements of consumers with their business. The most commonly used definition of marketing is: "Marketing is the process of planning and implementing the creation of ideas, products, and services, determining their prices, promotion, and distribution in order to make an exchange that meets the goals of individuals and organizations" (Ozretić Dođen & Previšić, 2004: 8). From the above definition, it is concluded that the goal is to find satisfaction, i.e., fulfillment of the goals of the individual and business entity. Continuous research is carried out to investigate the wishes and needs of consumers, thus forming and creating a product (service). All marketing theories highlight the consumer as the essence of the marketing concept. "It is the satisfaction of needs that introduces us to a new era in which discovering the needs of the client, as well as differentiating from other competitors on the market, becomes a driver of success" (Vranešević, Vignali & Vrontis, 2004: 8). The business entity that manages to define the needs and desires of the market and adapt its product to it has a high chance of business success.

This paper will explore and analyze the effectiveness of marketing campaigns in public utility companies. The marketing campaign is carried out continuously by the public utility company Komunalno društvo Čistoća d.o.o., the Department of the City Administration for Development, Urbanism, Ecology and Land Management of the City of Rijeka and the Department of the City

Administration for the Public Utility System of the City of Rijeka. The marketing campaign aims to increase awareness of the importance of waste separation, inform users about waste collection from door to door and take care of the community. Data from 2020 and 2021 on the quantities and types of collected waste will be analyzed, and surveys will be conducted among users of services of Komunalno društvo Čistoća d.o.o.

The hypotheses of the paper are:
1. After conducting a marketing campaign for waste separation, users began to implement waste separation.
2. After conducting a marketing campaign for waste separation, users are satisfied with implementing a new waste disposal method.
3. After conducting a marketing campaign, users became aware of why waste separation benefits the community, the environment, and the area where they live.

The conducted research can serve as a recommendation for implementing the marketing campaign of public utility companies, but also for other publicly owned business entities that perform services for the common good. The research was conducted while writing the graduate thesis of the paper's co-author (Kogoj, 2022). The paper presents a theoretical background based on primary and secondary research. The methods used are inductive, deductive, analysis, generalization, and statistical. The manner of conducting research is a survey questionnaire among voters. The research part of the paper is based on the work and collaborative relationship of the author with the department conducting the marketing campaign in Komunalno društvo Čistoća d.o.o., and the conducted research among users of the services Čistoća d.o.o. The manner of conducting research is a survey questionnaire among voters. It should be emphasized that the readiness of citizens to adopt and implement separation and disposal is exceptionally high. However, continuous communication based on the education and motivation of citizens is necessary. Without strategic communication and implementing a marketing campaign, only interested individuals will be aware of their role in the sustainable development of the area in which they live. The campaign aims to increase the percentage and create a long-term and sustainable change.

2. IMPACT OF MARKETING CAMPAIGNS ON THE IMPLEMENTATION OF WASTE SORTING

All business entities, regardless of ownership, driven by frequent and accelerated changes in the environment and trends, must adjust their business accordingly. These conditions require planning business activities based on strategies and plans that must be constantly harmonized. A marketing campaign is a strategic plan business entities use to organize, execute, and track their marketing strategy over a defined time. It is based on planning. To be successful, it is necessary to monitor the performance of all planned activities. The objectives of a public company may vary depending on its nature, activity, and specific conditions. The main objective of many public companies is to provide quality public services to citizens. This may include water and energy supply, transport services, health care, education, and other services essential for society's welfare. Also, public companies are usually responsible for managing available resources efficiently, such as finance, human resources, infrastructure, and technological resources. The goal is to optimize the use of these resources to achieve the best value for the community.

Social networks have contributed to the role of marketing in improving the performance of public companies. Any member of social networks can post what he disagrees with, and create a public debate, even if it is based on negative publicity. Due to this fact, public and private companies invest their resources in communication with users. In order to improve communication and encourage interaction with the market, public companies conduct marketing campaigns intending to define the wishes and needs of the target market. It is important to note that the specific objectives of public companies can be determined by legal regulations, government policies, or specific requirements set by the society in which they operate. Today, marketing in public companies is an unexplored field. A small number of public companies have a marketing department. This is because the vast majority of public companies, i.e., their managers, view the concept and activity of marketing as synonymous with advertising and promotion. Public companies in Croatia continue to conduct business on the principle of operation and work from the socialist system. "Ignorance of marketing is equivalent to not conducting marketing research; not defining one's clients, partners, and competitors; not segmenting, not targeting and not positioning one's services; not managing processes full of challenges such as innovations and launching new products; not recognizing new channels of distribution of public

services; inappropriately defining prices for such services when the agency has to recover part of its costs and not presenting data about them clearly and convincingly" (Kotler & Lee, 2007: 11). In this part of the paper, the concepts of marketing in the public sector and the concept of marketing campaign will be presented. The results of the conducted research will be presented afterward. The research is based on the analysis of campaign effectiveness with particular emphasis on the analysis of quantitative data from the operations of the company Čistoća d.o.o. and the analysis of the conducted survey among users of the service (target market) of the company Čistoća d.o.o.

2.1. Marketing in the public sector

The marketing process is the only long-term way to plan the work of public companies that want to meet the needs of citizens and deliver real value. A common feature of public companies is that they are controlled and mainly financed by the state. Regardless of ownership and financing, every organization that plans to be successful in the long run must apply strategic marketing, without which there is no success in the market. Basic marketing knowledge will be presented before presenting marketing mechanisms in the public sector. Some of the definitions of marketing are:

- "Marketing is a social process by which individuals and groups achieve what they need and want, by creating, offering and freely exchanging products and services of a certain value with others" (Renko, 2009: 9).
- "Marketing is a human activity aimed at satisfying needs and desires through an exchange process" (Meler, 2002: 3).
- "Marketing is an encompassing way of thinking and acting of individuals, business groups, small and medium-sized enterprises, companies, corporations, business, and non-profit institutions, which participate in the exchange of any value on the market" (Ružić, Biloš & Turkalj, 2014: 61).

All definitions are based on voluntary exchange and mutual satisfaction of all participants. Marketing in the public sector refers to applying marketing principles, techniques, and tools in organizations operating in the public sector, such as government agencies, non-governmental organizations, schools, universities, hospitals, local governments, and the like. This marketing approach aims to improve public sector organizations' relations with their users, citizens, the public, and other stakeholders. In the public sector, marketing creates aware-

ness of the services and programs provided by organizations, informs the public about their importance and availability, and improves user perception and satisfaction. Marketing strategies and tactics are applied to identify user needs, develop goals and messages, select communication channels, and implement activities to increase user value and achieve the organization's goals. Examples of marketing activities in the public sector include market research to understand the attitudes and needs of users, market segmentation to identify specific segments of users with special needs, development of marketing strategies and plans, branding of public sector organizations, promotion through media and social networks, organization of events and public appearances, evaluation of the effectiveness of marketing activities, etc. The marketing approach in the public sector helps organizations achieve their goals, improve communication with users, create trust and public support, and improve efficiency and transparency of work in the public sector. The marketing mix in the public sector refers to applying marketing strategies and tools for promoting and improving public institutions' services, programs, and initiatives. Although the marketing mix has traditionally been associated with the private sector, many public organizations recognize the importance of applying marketing principles to improve relationships with citizens, raise awareness of their services and achieve goals. The classic marketing mix consists of four key elements, known as the "4Ps" - product, price, promotion, and distribution. In the context of the public sector, these elements can be adapted to better suit organizations' specific needs and objectives. Here is how each element can be applied in the public sector:

1. Product: In the public sector, a product refers to services, programs, or initiatives an organization provides to citizens or the community. It is essential to identify the fundamental values and benefits that the organization provides and develop quality services or programs that meet these needs.

2. Price: Although there may not be a literal price in the public sector as in the private sector, there is essential to determine the value that citizens receive from services or programs. This may include reasonable charges for certain services, a fair allocation of resources, or transparency in the use of public funds.

3. Promotion: Promotion includes marketing activities to inform citizens about an organization's services, programs, or initiatives. This may include public notice campaigns, social media, printed materials, public

events, etc. The goal is to raise awareness and create citizens' trust in the organization.

4. Place: Distribution (place) refers to how services or programs of an organization are delivered to citizens. This may include physical locations, online platforms, mobile applications, or other communication channels. The aim is to facilitate access to services and programs for citizens.

In addition to the classic 4Ps, additional elements can be applied in the public sector, such as:

5. People: A quality service in the public sector requires staff with the skills, knowledge, and courtesy to provide services to citizens. Therefore, Investing in employee training and development is essential to ensure quality service is provided at all levels.

6. Processes: Effective processes and procedures are crucial in providing services in the public sector. Organizations should assess existing processes and identify ways to improve efficiency, reduce red tape and increase citizen satisfaction.

It is important to emphasize that the marketing mix in the public sector should be focused on meeting the citizens' needs and achieving the organization's goals, not on profitability as in the private sector. The main focus is improving services, transparency, civic participation, and citizens' satisfaction. The fact is that the public sector has specific communication and promotion of its services. In order to improve the relationship with consumers and direct them to behavior that will benefit the community in which they operate, public companies must strategically convey the defined message, i.e., the defined goal, through their distribution channels and promotional activities. Public companies must effectively use promotion, that is, communication with their users. It is necessary to define what the business entity wants the target market to know, believe, and do to define the message, i.e., communicate effectively. The basis of today's business and private communication is the Internet. With technology's help, marketers communicate with the target market.

2.2. Marketing campaign

A marketing campaign is an organized set of activities and strategies to promote a product, service, or brand and achieve a specific goal. This may include various marketing channels and tools such as advertising, public relations, di-

rect marketing, social media, events, sponsorships, etc. The goal of a marketing campaign can be diverse, depending on the needs and goals of the company. Some common goals may include:

1. Raising awareness: Campaigns can focus on raising awareness of a brand, product, or service among the target audience.
2. Sales boost: Campaigns can be conducted to drive sales and increase market share.
3. Improving reputation: Campaigns can focus on improving brand perception and reputation among consumers.
4. Creating loyalty: Campaigns can be used to build long-term relationships with clients and consumers to create brand loyalty.
5. Introduction of a new product: Campaigns are often carried out to introduce new products or services to the market and attract the target audience's attention.

Critical marketing campaign elements include identifying the target audience, developing a marketing strategy, selecting marketing channels and tools, planning budgets, creating marketing materials and messages, implementing a campaign, tracking results, and analyzing campaign effectiveness. The marketing campaign must be well-designed and targeted in order to be successful. Analysis of results and feedback during and after the campaign allows marketers to tailor their strategies and achieve better results in future campaigns. Each campaign needs to be tailored to the target market. Each market has its specifics according to which the business entity must adjust the marketing campaign. Every campaign has to go through marketing control based on achieving goals.

It should be emphasized that any marketing action brings benefits in the long run. The result is not achieved overnight. Every campaign requires time and repetition to achieve the set goals. "A company's strategy is a game plan that management uses to grow its business, gain market position, attract customers and accommodate them, successfully compete, manage its operations and achieve the desired goals" (Thompson, Strickland & Gamble, 2008: 3). For each marketing campaign, a strategy is also set according to market conditions and the environment in which the business entity operates. A quality marketing campaign is based on a modern management system. A new approach characterizes it:

• "the plans set periodically, i.e., for one year, must be as flexible as possible about the events in the environment,

- ✦ flexibility and timely decision-making that is, reaction to changing events in the environment, are the basic prerequisites for the action of the marketing strategy,
- ✦ close monitoring of events in the environment requires continuous and realistic information, and not those collected only once a year,
- ✦ marketing strategies must be set up flexibly so that they can provide new strategic options in the event of changes in the environment,
- ✦ marketing strategies must provide the opportunity for the company not only to adapt to changes in the environment but also to influence them, such as new technologies, new ways of satisfying consumers,
- ✦ marketing strategies are more than any other management system oriented towards the market and the future" (Renko, 2009: 72).

The success of a marketing campaign can be measured in different ways, depending on the campaign's objectives and the type of marketing activities carried out. Here are some standard methods of measuring the success of a marketing campaign:

1. Increase in sales: One of the critical indicators of the success of a marketing campaign is the increase in sales of products or services. Tracking revenue growth or the number of units sold can be used as a measure of campaign success.
2. Lead generation: If a campaign aims to attract new leads, measuring the number of leads generated can be an important indicator of success. This may include the number of contact information collected or calculating the conversion rate of potential customers to actual customers.
3. Increasing brand awareness: If the campaign aims to improve brand recognition, brand awareness measurement can be used. This may include surveying using surveys or tracking the rise in the search for a brand online.
4. User engagement: Measuring user engagement on social media, such as the number of likes, comments, shares, or reactions, can indicate campaign success. Greater engagement indicates greater audience interest.
5. Return on investment (ROI): Return on investment is a crucial indicator of the success of a marketing campaign. It is measured by the ratio between the funds invested in the campaign and the revenues or benefits generated. Proper ROI calculation requires monitoring of campaign costs and the concrete results achieved by the campaign.

6. Tracking of website traffic: If a campaign aims to attract visitors, tracking the number of visits, bounce rates, and conversion rates on the website can be helpful performance indicators.

It is essential to select relevant metrics to track campaign performance, depending on the campaign's objectives and the specifics of the industry or product. Integrating analytical tools and tracking results during the campaign can help make informed decisions about adjustments and optimize marketing activities. The task of marketers is to analyze opportunities and investments in those channels that potentially bring the most significant profit. Of course, the usefulness and impact of a marketing campaign depend on the activity in which the business entity competes and the defined goals set at the beginning of the marketing campaign.

2.3. Research the effectiveness of marketing campaigns in the public utility company Čistoća d.o.o.

This chapter will present the research on the marketing campaign's effectiveness in the public utility company Čistoća d.o.o. As already mentioned in the introduction to the paper, the primary objective is to analyze the effectiveness of the campaign with particular emphasis on the analysis of quantitative data from the operations of the company Čistoća d.o.o., and the analysis of the conducted survey among users of the service (target market) of the company Čistoća d.o.o. Komunalno društvo Čistoća d.o.o. is a company that maintains cleanliness and waste management in the area of the city of Rijeka and the "Rijeka Ring", which includes the cities of Bakar, Kastav, and Kraljevica, and the municipalities of Klana, Jelenje, Viškovo, Kostrena, and Čavle. The activity refers to the collection and disposal of waste, cleaning of public traffic areas, maintaining public toilets, bathrooms and beaches, and maintaining green areas of the city of Rijeka. The public utility company collects public waste through 7,500 containers for separate collection of paper and cardboard, glass, plastic, metal, and so-called Tetra Pak packaging and 6,900 containers to dispose of remaining (mixed) public waste in public transport areas. In addition to these services, they offer the disposal of valuable and problematic waste and the removal of non-hazardous production waste of business entities from the territory of the city of Rijeka and the "Rijeka Ring".

The set hypotheses of the paper are:

1. After conducting a marketing campaign for waste separation, users began to implement waste separation.
2. After conducting a marketing campaign for waste separation, users are satisfied with implementing a new waste disposal method.
3. After conducting a marketing campaign, users became aware of why waste separation benefits the community, the environment, and the area where they live.

The paper uses research conducted by the co-author (Kogoj), who used a part of the research to write a graduate thesis entitled "Effectiveness of Marketing Campaigns in Public Utility Companies". The paper is based on primary research. The results can be used to improve the joint action of business entities from the same or similar activity and serve as a framework for further research. Based on the analysis of the hypotheses, it is concluded that the marketing campaign aimed to inform and educate users about the benefits of waste separation.

The marketing campaign was carried out by joint action of the following entities:
- Komunalno društvo Čistoća d.o.o.,
- the Department of City Administration for Development, Urbanism, Ecology, and Land Management of the City of Rijeka and
- the Department of the City Administration for the Public Utility System of the City of Rijeka.

It should be emphasized that the marketing campaign has been carried out continuously since 2014 when Čistoća d.o.o. introduced a system of separate waste disposal in such a way as to enable each household to separate and dispose of waste as close as possible to the place of origin. In order to increase the use of this service, the company began a strategic marketing campaign. The primary objective is to inform citizens about sustainable waste management's environmental, economic and socially beneficial aspects. The conducted marketing campaign is highly complex because it is aimed at different groups of users (target market):

- citizens,
- children:
    - preschool children,
    - lower grades in elementary school,
    - upper grades of elementary school,

- young people (high school pupils, students),
- business entities,
- educational institutions and
- tourists.

The basic message that wants to be conveyed is related to responsible waste management and the circular economy principle. Various communication channels were used: leaflets, brochures, posters, mass media (radio shows, specialized TV shows, videos, ads, newspapers…), portals, educational activities in kindergartens and schools, children's performances, virtual exhibitions, workshops… It is evident that various channels have been used and that the campaign is highly complex. The disadvantage of the marketing campaign is its insufficient presence on the Internet. The presence on the Internet has been reduced to posts on local portals and social networks of project partners. Social networks are the cornerstones of communication today. The public utility company Komunalno društvo Čistoća d.o.o. does not have profiles on social networks, and today's most influential medium has not been used.

The first part of the research relates to analyzing and comparing the quantities of waste collected in 2020 and 2021. Table 1 shows the quantities of mixed public waste collected in 2020 and 2021. Mixed public waste means all waste that cannot be separated into other containers or a recycling yard.

Table 1 Quantities of mixed public waste collected by the public utility company Komunalno društvo Čistoća d.o.o. in 2020 and 2021

Type of public waste	2020	2021	%
Mixed public waste	53,116.78	52,606.44	-1.0%
Paper	2,737.00	2,544.17	-7%
Cardboard	795.39	795.75	0%
Glass packaging	6.15	8.60	40%
Multilayer (Tetra Pak) packaging	7.38	12.43	69%
Plastic packaging	110.64	186.46	69%
Metal packaging	29.50	49.72	68%

Source: created by the author

The data analysis in Table 1 shows that the amount of mixed public waste collected decreased by one percent in 2021 compared to 2020. Due to the global

Covid 19 pandemic, users spent more time in their homes intending to prevent diseases, which should have increased collected waste. This data confirms the first hypothesis of the paper, "After conducting a marketing campaign for waste separation. Users began to implement waste separation". Mixed waste represents the fundamental data of the sorting analysis. The reduction percentage would have been highly higher if it had not been for the pandemic and isolation. A negative indicator is the amount of paper collected, which decreased by seven percent. This is also a consequence of the pandemic, as well as schooling and working from home. The quantities of cardboard collected are identical. Indicators confirming the first hypothesis are the quantities of collected glass packaging, multilayer packaging, plastic packaging, and metal packaging. These packaging materials are valuable raw materials that can be fully recycled. In addition to the first hypothesis, it should be pointed out that the data presented confirm the third hypothesis: "After conducting a marketing campaign, users became aware of why waste separation is beneficial for the community, the environment, and the area in which they live." This can be inferred from the fact that the users would not have carried out the separation if they were not aware of the benefits to the community, the environment and the area in which they live. These indicators are exceptional marketing campaign success and a good indicator for future action.

The campaign focused on plastic, glass, and metal packaging, which confirms the campaign's success. Also, on a sample of 583 users of Čistoća d.o.o. services from the area of the Municipality of Klana, amounts stated on utility bills were analyzed before and after the introduction of the individualization system. The system mentioned above refers to the amounts stated on utility bills according to the collection of mixed public waste. All users are allowed to dispose of other types of waste free of charge. The analysis of the utility bills determines the following:

- the price increased in 71 users (12%),
- the price remained unchanged in 17 users (3%) and
- the price decreased in 495 users (85%).

Although the primary reason for separating waste should not be financed, it is essential to market these data to users, increase the amount of waste collected, and achieve the set goals. This data confirms the first hypothesis of the paper because 85% of users have reduced their utility bills due to the sorting of waste.

The second part of the research refers to the conducted survey among users of the services of the company Čistoća d.o.o. The survey was conducted through Google Forms and sent to all users. All participants are in the company database, i.e., they have agreed to receive informative e-mails. The survey included 176 participants. 19% of participants answered questions in the status of a legal person, while 81% of participants are in the status of a natural person. This indicator was examined because there were possible differences in responses concerning status. However, the analysis of other responses shows that the differences are imperceptible, so the following results are not further analyzed regarding the status of the user. Participants point out that the basis of communication with the company Čistoća d.o.o. is the website and leaflets that arrive together with the utility bills. The following group of questions examined the availability of information on services. The average score is 3.90, meaning that participants rate information availability excellently.

The following question examined participants' awareness of their role and waste prevention options. The results are shown in Graph 1. As many as 74% of participants pointed out that they know their role and possibilities in waste prevention. The stated percentage is high and can be used to accept the third hypothesis of the paper "After conducting a marketing campaign, users became aware of why waste separation is useful for the community, the environment, and the area in which they live". Of course, with a continuous marketing campaign, educating and informing the participants who answered the question negatively is necessary. The next question also concerned the confirmation of the third hypothesis. When asked how to educate about proper waste management, 53.40% of participants pointed out that Komunalno društvo Čistoća d.o.o. is their primary source of education and information. This data confirms the effectiveness of the marketing campaign. After the above answers, the preferences and habits on waste separation were examined. It is a highly positive indicator that 80% of participants separate waste. This answer confirms the marketing campaign's effectiveness and the paper's first hypothesis.

Graph 1 Awareness of the role and possibilities of waste prevention
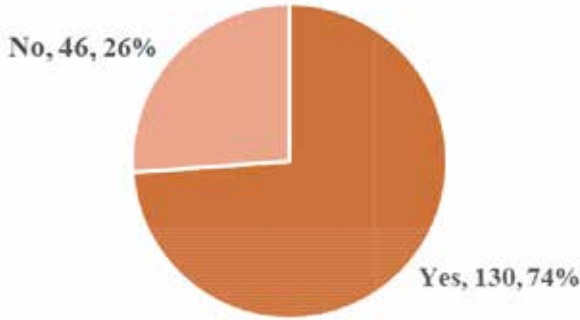
Source: created by the author

It should be emphasized that the separation of waste in the analyzed area began after the marketing campaign. However, 25 participants stated that they do not know where the containers are located, which is the information that Čistoća d.o.o. must use, and in future communication with users, pay attention to information regarding the types of waste and the location of the containers. Separation of waste is easy to carry out when household containers are secured. However, the process is more complicated for those types of waste for which there are no independent containers but common ones.

**Graph 2 Do you separate waste**
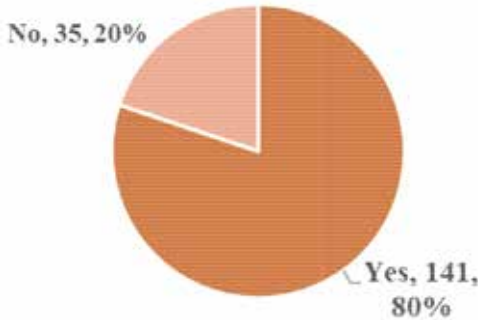
Source: created by the author

As many as 94 participants pointed out that Čistoća d.o.o. significantly influenced the decision to separate waste. Data confirms the first and third hypotheses because, after the marketing campaign, the participants began to separate waste, and how they are aware of why separation is beneficial for the

community, the environment, and the area in which they live. In addition to confirming the hypotheses, the data also emphasizes the marketing campaign's effectiveness.

Graph 3 Who has had the most significant influence on your decision to separate waste
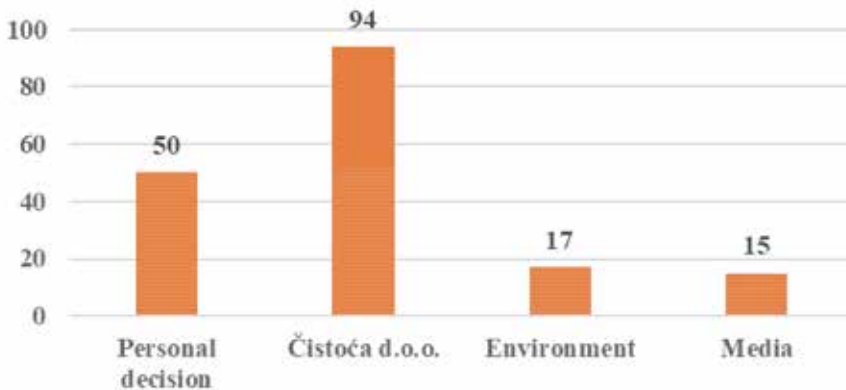
When asked why participants separate waste, participants could provide multiple answers. It is optimistic that most participants separate the waste for future generations and the environment. Also, many participants separate waste because the utility company Komunalno društvo Čistoća d.o.o. enabled the abovementioned service and provided numerous containers at many public locations. These responses also positively evaluate the implementation of the marketing campaign. The next group of questions related to the testing of the second hypothesis of the paper, "After conducting a marketing campaign for waste separation, users are satisfied with the way of implementing a new way of waste disposal". As many as 98% of participants noted that waste is regularly disposed of, which is the basis of cooperation and user satisfaction. 73% of participants consider the waste separation system to be practical. The above data confirm the second hypothesis of the paper. Participants pointed out that 87% did not separate waste until they received separate containers. Accordingly, it is concluded that the operation and expansion of the services of the utility company Komunalno društvo Čistoća d.o.o. is the basis of waste separation and the development of environmental awareness. Based on this information, a business decision can be made on a particular type of waste. When users are

provided with a container or collection, they are ready to follow the instructions to protect the environment and the community. Participants rate the quality of service with an average rating of 3.74, which means they are delighted, which confirms the second hypothesis.

3. CONCLUSION

Marketing is the foundation of business success. It is essential for informing consumers about the existence of a product or service. Without marketing, consumers would not know what the business entity offers. Effective advertising, promotion, and other marketing activities help build brand recognition and increase consumer awareness of the products or services the business entity offers. The term marketing campaign implies the determination of the marketing strategy and the implementation of the promotion process. A marketing campaign is based on the set goals and defined implementation time.

It should be noted that the usefulness and impact of a marketing campaign depend on the business activity in which the business entity competes and the defined objectives set at the beginning of the campaign. If the campaign message and content are relevant and engaging to the target audience, the campaign will likely achieve the desired impact. Also, suppose the communication channels are selected according to the target audience's preferences and allow effective delivery of the message. In that case, the campaign will likely achieve a more significant impact.

The paper investigates the effectiveness of the marketing campaign carried out by the utility company Komunalno društvo Čistoća d.o.o., the City of Rijeka, the City Administration Department for Development, Urbanism, Ecology and Land Management of the City of Rijeka, and the Department of the City Administration for the Public Utility System. Komunalno društvo Čistoća d.o.o. is a company for maintaining cleanliness and waste management in the area of the city of Rijeka and the "Rijeka Ring", which includes the cities of Bakar, Kastav, and Kraljevica and the municipalities of Klan, Jelenje, Viškovo, Kostrena, and Čavle. The marketing campaign has been running since 2014. The aim of the campaign is separate waste disposal. In addition to the stated aim, the campaign wants to introduce citizens to sustainable waste management's environmental, economic and socially beneficial aspects. The research consisted of two parts. The first part analyzes data on the quantities of waste

collected by Komunalno društvo Čistoća d.o.o., and the second part is the user survey through a questionnaire. A total of 176 participants participated in the survey. By analyzing the data on the collected waste of Komunalno društvo Čistoća d.o.o., the reduction of public waste is visible, as well as the growth of the collected quantities of glass, multilayer, plastic, and metal packaging, which confirms the first hypothesis of the paper. The strategically implemented marketing campaign has developed environmental awareness of users, which leads to sustainable waste management in the long term. These results confirm the first and third hypotheses of the paper: "After conducting a marketing campaign for waste separation, users began to implement waste separation" and "After conducting a marketing campaign, users became aware of why waste separation is useful for the community, the environment and the area in which they live". By achieving the growth of the collected quantities of waste, the marketing campaign's effectiveness is proven. By surveying users, they also confirm the hypotheses set. Most participants carried out waste separation, and the campaign significantly impacted their decision to separate waste. The surveyed users pointed out that they are satisfied with the way the waste disposal and separation are carried out and that they are aware of why the separation is helpful for the community and future generations, thus confirming the second ("After conducting a marketing campaign for waste separation, users are satisfied with the way of implementing a new way of waste disposal") and the third hypothesis.

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AWARENESS OR PRESTIGE? EXPLORING THE ECOSYSTEM OF ELECTRIC CAR USERS

Bence VERECKEI-POÓR, Ph.D. student
University of Pécs, Faculty of Business and Economics,
Department of Marketing and Tourism

E-mail: poor.bence@ktk.pte.hu

Mária TÖRŐCSIK, Ph.D.
University of Pécs, Faculty of Business and Economics,
Department of Marketing and Tourism

E-mail: torocsik.maria@ktk.pte.hu

Abstract

The study seeks to explore the issue of the ecosystem of electric car users. The uncontrolled freedom of our transportation, which society is used to and lives in, does not remain without consequences. This behavior generates many environmental problems in the century of global climate change. The correct application of technological innovations can significantly improve the quality of our living space and provide us with a cleaner future. Many components of the consumer ecosystem are known, and awareness can be the watchword to connect them. In this perspective, we can choose to dress more consciously, eat more sustainably, or even select transportation alternatives that have a less negative impact on our environment. Do those who use electric vehicles and drive CO2-free have any ecosystem? In their case, does conscious consumption appear, and do they buy such a car because of the idea of a cleaner future, or the background of their decision is not so complex? Maybe they want to be fashionable, or perhaps the electric vehicle is a matter of prestige for them. In our study, we are looking for the answer if a consumer ecosystem of electric car users or awareness appears in other areas of their purchases. To answer these questions, we obtained data from 6 in-depth interviews conducted in April 2023 with male and female representatives of 3 age groups who use purely electric cars.

Keywords: *ecosystem, consumption behavior, electric car*

JEL Classification: *M31, Q56*

1. INTRODUCTION

The electric car as a sustainable means of transport has been part of our everyday lives for several years. They can be found on the streets as a personnel transport method but are also increasingly present in public vehicle fleets. The technology is considered by many to be in its infancy and cannot fully replace petrol and diesel cars. These cars are slowly but steadily increasing in Hungary and most European countries. Although many people would like to switch from their conventional car to an electric car, the price of such cars does not allow this for everyone. However, there are countries where the state provides financial and other incentives to encourage e-car purchases – Norway, for example, where 65 percent of newly sold cars in 2021 were fully electric (Klesty, 2022) – but this is not the case everywhere. In Hungary, only 8 percent of new cars sold in 2021 were equipped with electric technology (Mild-Hybrid Electric Vehicle, Plug-in-Hybrid Electric Vehicle, Battery Electric Vehicle). In Croatia, sales figures are even lower, with only 4 percent of new cars sold in 2021 equipped with electric technology (Bello, 2023). Of course, with electric car numbers slowly rising, the number of people using electric cars is also growing very slowly, and they are challenging to reach. In an online survey of 1,000 people representative of the adult Hungarian population conducted in 2021 (Vereckei-Poór & Törőcsik, 2022), only 19 people owned an electric car, of which only 13 used a purely electric car (BEV – Battery Electric Vehicle), the most relevant for our research. However, research curiosity is working, which extends, for example, to what motivates the choices of these consumers and what is typical of them. The research question thus arises as to what kind of consumption medium those who have chosen this less polluting mode of transport under the auspices of sustainability constitute. We hypothesize that an ecosystem can be drawn up that shows a correlation between areas where conscious consumption that promotes sustainability can still be seen.

Ecosystem as a term appears mainly in ecological topics. At the same time, the term economic ecosystem is increasingly being used in specialist articles. In our research, we refer to a consumption network as an ecosystem when parts of the network can be associated with the value of sustainability and when the parts form a coherent system within the network. Having researched the behavior of electric car users, we start by distinguishing between those who decide to buy an electric car and those who use it. Of course, there are more cases where these two are the same. However, we felt it essential to recognize that e-car us-

ers may pay the slightest attention to sustainability, simply using the car because it is available in the household. For these reasons, we defined at the outset of our research topic that the relevant target group would be those who had chosen to purchase and use an e-car.

In this research, we introduce the results of in-depth interviews with 6 Hungarian women and men of 3 age groups who use BEVs. The presentation of the results of the in-depth interviews will answer the question of which age groups in which areas of the ecosystem show the highest awareness in consumption decisions.

2. CATEGORIES OF THE POSSIBLE ECOSYSTEM OF ELECTRIC CAR USERS

We believe that the main reason electric car users have bought electric cars is sustainability. This leads us to conclude that users also know other consumption areas. As seen in everyday life, products and product categories that represent sustainability are already present in many areas. Having looked at these, we have created categories where e-car users can show further awareness. These categories are financial decisions (conscious spending, savings), food (organic products, alternative diets, avoiding hoarding), mobility (sharing, public transport), energy (use of intelligent devices, energy use), housing (materials used in construction, garden), cleaning/sanitation (natural materials, alternative cleaning materials), clothing (frequency of purchase, second-hand clothing), and waste (selective waste collection, avoiding waste). In order to visualize these categories, we have created an ecosystem model (Figure 1) where the electric car user is in the center and is surrounded by the categories described.

Figure 1. The possible ecosystem of electric car users
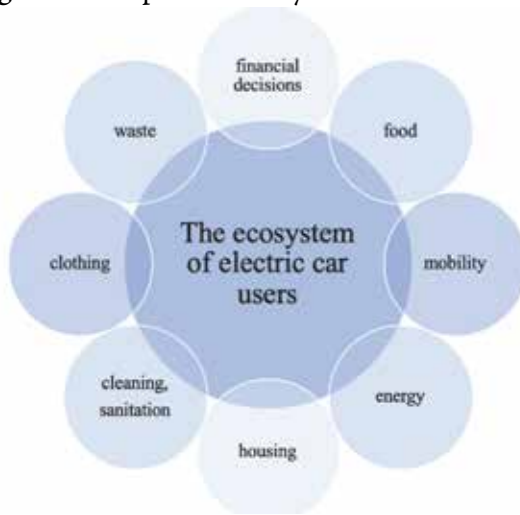
Source: Authors

When we think about being conscious of our *financial decisions*, it is essential to recognize that we live in a business, a political and market environment where it is challenging to avoid buying unnecessary products (Nyikos, 2022). Our environment tempts us to constantly grow and buy bigger, better, and nicer, making it easy to collect things we do not need. The economy is increasingly being pushed into the background, and there is a growing trend towards thoughtless, ill-considered purchases, which are having a very negative impact on our environment. Of course, it is not just the consumers who are to blame, as the producers of products can be just as responsible. It is not for nothing that initiatives such as the ESG framework have emerged to measure the sustainable performance of companies. This, combined with the growing demand for sustainable finance, is forcing large companies to change their operations. Consumers who are conscious of their financial decisions invest in businesses that prioritize environmental aspects (Broom, 2022).

Conscious consumption of *food* is another way to reduce our ecological footprint. For example, we can think of buying local products instead of those that travel thousands of kilometers to our local shop, buying freshly produced food instead of frozen ones, and even adopting and following alternative diets such as vegetarianism, veganism, or flexitarianism. Alternative diets are highly divisive, as a varied diet is good for human health and makes our environment more sustainable (Steenson & Buttriss, 2020). The food systems underpin them are

highly complex, with the environment, people, infrastructure, and transport being just some of the parts of a complex system. The coordination of these and many other steps results in the process by which this area becomes part of the economy (HLPE, 2014). The relationship between environmental impact and a healthy diet is considered necessary, as there are diets that are less healthy but have a smaller impact on the environment, and there are diets that are less healthy but have a much smaller impact in terms of environmental impact (Garnett, 2016). It is essential to find a diet where a balance between eating healthy and reducing the level of ecological footprint is reflected. We hypothesize that for electric car users, this may also emerge as an area within which they consider sustainability to be important when making purchasing decisions.

The mobility category may be questioned as to why it should be examined for electric car users. As we know, household travel patterns substantially influence environmental pressures. In today's environment, everyone travels where they want, when they want, if they have the financial means to do so. Meeting these needs requires a well-organized infrastructure and a high degree of flexibility from transportation companies. Of course, it is essential to distinguish between daily transport and tourism transport. In tourism, many destinations explicitly seek to meet the need for sustainable development (Krajinovic, 2022). At the same time, while in the past, air travel and floating hotels (cruise ships) were only available to the privileged, today we can plan trips to remote destinations for relatively little money (Baker, 2013), and these modes of transport are becoming increasingly popular (Dowling & Weeden, 2017). Let us go back to the daily means of transport. Electric buses can be found in many cities today, and services based on the sharing economy are becoming increasingly popular in larger cities, which can be seen not only in the mobility sector (Jani & Mwakyusa, 2022). The emergence of the latter may bring a change in the global trend of car ownership, where it would be unnecessary to own a car, which costs money even when we do not drive them (Ujj, 2020). The services providing sharing in mobility are also available in Hungary – whose vehicle fleets contain mostly fulfilled electric vehicles – are simple, and all you need is a smartphone to use the service. It is assumed that those who use e-cars will prioritize sustainability and cleaner transport by using their electric car and other forms of mobility.

Energy use and management is also an area where the ecological footprint size can be reduced through conscious behavior. With the growth and the in-

creasing number of electronic products, the energy consumption of humanity is constantly growing. Large amounts of crude oil are needed to produce energy. Since electric cars also need to be charged with electricity, this is one of the strongest arguments against the sustainable nature of electric cars (Ortar & Ryghaug, 2019). At the same time, a growing number of innovative products can be used to gain energy from natural resources. We are considering renewable energy sources such as solar, wind, hydro, or geothermal (Mbungu et al., 2020). Technologies are available to obtain energy from nature, one of the most popular and widespread of which is solar panels. When mounted on our roofs, these can generate electricity without producing emissions (Adeh, 2019). We assume that electric car users are conscious about their energy consumption and also try to charge their cars in a way that does not pollute the environment.

The *housing* category is also part of the ecosystem. The apartment, our house, is an integral part of our daily lives. Whether our house is old or new, we now have the opportunity to use materials and techniques that have less impact on the environment. Energy supply and home heating are significant contributors to greenhouse gas emissions (EPA, 2018), so it is worth considering energy efficiency when renovating or building. If you have a garden, you can grow your fruit or vegetables, which you do not have to worry about watering if you use a rainwater harvester. It is likely that e-car users will consider the importance of energy-saving when renovating or building a house and will try to choose energy-saving, sustainable solutions.

Cleaning and sanitation are other categories where we can do good for the environment by conscious consumption. The various cleaning and detergent products in the household contain many substances that are not biodegradable and pollute the environment by going down the drain. Eco-products that no longer contain petroleum and natural gas derivatives or synthetic substances are appearing on the shelves of shops. These cleaner products are mainly made from materials that come from nature, so they do not increase the ecological footprint when they are returned to nature. Of course, these products are much more expensive to produce (Sztrunga, 2020), but more and more people are using alternative cleaning products. Using household ingredients such as baking soda, citric acid, vinegar, or combinations of these, diluted with water can replace less environmentally friendly products. Besides, small steps such as more conscious use of household appliances such as washing machines can also protect our

environment (Visser & Schoormans, 2023). In our imagined ecosystem, this could be another category where higher awareness is evident for e-car users.

Besides the car industry, *clothing* is one of the most polluting industries. This industry is responsible for 10 percent of total CO2 emissions, a share that is estimated to increase steadily (Tamás-Krivácsy & Bárdos, 2022). Textile residues from clothes are already present in the air, soil, and oceans, which may be a severe concern for the industry's sustainability (Liu et al., 2021). The actors have recognized the need for more conscious clothing (Phau & Ong, 2007), which is increasingly being addressed. We can now find second-hand clothing stores that give a new chance to clothes that would otherwise be thrown away, and at the same time, the environment is protected by preserving the persistent substances found in clothing (Wang et al., 2022). Experiments are also underway to help our environment by using new materials not previously used to facilitate degradation (Ayyanar et al., 2023). One example is seaweed, for which algae farms have been established (Duarte et al., 2021). The use of these and similar materials in the clothing industry is still in its infancy, but it is hoped that we will see more and more of these garments soon. In the case of e-car users, it is assumed that they are conscious of their clothing consumption too.

The last and one of the largest categories is *waste*. Waste management has always been a problem for humanity. An earlier concept of reducing the amount of waste produced is not working. It is more the recycling of waste that is driving sustainability. Increasingly, we see recycled products, even in areas such as the automotive industry, where some companies produce seat cushions made from recycled pet bottles (Boleslav, 2022; Carney, 2021). Accumulation is also a significant contributor to the increase in household waste. The range of new products is constantly expanding. Electronic waste is also increasing as consumers are encouraged to buy new products (even if the one at home is still functional). The same is true for food, where the conspicuousness of the packaging (Aschemann-Witzel et al., 2015) makes impulse buying predominant, thus allowing emotional involvement to prevail over the consumer (Törőcsik & Szűcs, 2022). Conscious buying is rarely compatible with impulse buying, and purchasing an electric car shows conscious decision-making. We believe that electric car users are also conscious of waste management in the context of sustainability.

3. METHODOLOGY

Our research is based on a face-to-face survey of 6 in-depth interviews conducted in April 2023, where we asked pure electric car (BEV) owners about the areas of their consumption where sustainability plays a role beyond using e-car. The interviewees were asked to rate their purchasing decisions in the areas described in the section above according to the importance of sustainability. A Likert scaling method from 1 to 10 was used for the rating, where the highest value meant a high involvement of importance. As indicated above, the number of people using electric cars in Hungary is deficient, so reaching them is often tricky. We had planned to use the usual, traditional age group definition with the X, Y, and Z Generations. However, as we are mainly interested in the opinion of e-car users who have purchased an electric car of their choice, we had to create specific age groups. As electric cars are relatively expensive, relatively few Generation Z people can afford one if they have even developed a taste for them. In the design phase of the research, we tried to find the youngest and the oldest e-car users in the Facebook group of the most significant Hungarian online electric car community (*Villanyautós tippek* és *kérdések – Electric car tips and questions*). However, we were not successful with this method. The respondents were reached through our contacts. The youngest respondent was 31, and the oldest was 71 years old. The interviewees were the representatives of 3 different age groups. In each age group, one woman and one man were interviewed. The youngest age group was the under 35, where the interviewees were Éva (34 years old, using an electric car for three years) and Zsolt (31 years old, using an e-car for two years). The middle age group was represented by those aged between 35 and 60, where Krisztina (53 years old, has owned an e-car for four years) and Szabolcs (49 years old, has owned an electric car for ten years) were the interviewees. In the oldest age group, those aged 60 and over were interviewed; Ágnes (71 years old, e-car owner for 1.5 months) and János (69 years old, e-car owner for two years) participated in the in-depth interview. The six interviewees are residents of 4 different cities in Hungary, and the in-depth interviews were all conducted and recorded in person.

4. RESULTS

In general, it can be outlined that most of the respondents chose an electric-driven vehicle as their daily means of transport out of conscious consideration,

and all of them have a petrol or diesel car in their immediate vicinity that they can use if necessary. In addition to their electric car usage habits, the most critical question for the study was: *"On a scale from 1 to 10, how well do you represent sustainability in your purchasing decisions in the following areas? Please first give a value for this and then tell us how sustainability is represented"*. As indicated above, these areas were: financial decisions, food; mobility; energy, housing, cleaning/ sanitation; clothing, and waste. The results were processed based on the responses of representatives of the three presented age groups.

4.1. Interviewees aged under 35 years

For interviewees under 35, the extent to which they consider sustainability necessary in their purchasing decisions varies widely across different areas. Food, energy, and clothing were the areas that both interviewees rated highly on a scale of 1 to 10. The radar chart below (Figure 2) shows the responses of the interviewees under 35 years. The chart shows the ratings on a Likert scale from 1 to 10, with the female interviewee (Éva) in red and the male interviewee (Zsolt) in blue.

Figure 2. Importance of sustainability in purchasing decisions in specified areas among respondents aged under 35
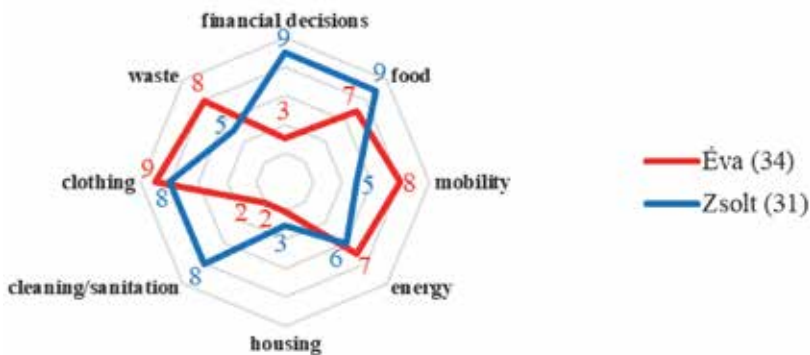
Source: Authors

When it comes to food, they both make sure that they go shopping with a list of only the products they need and do not like being tempted by products they have not planned to buy. Neither of them likes to hoard food, and both try to avoid food waste. They keep an eye out for special offers, where they can buy

products at a lower price, and in Zsolt's case, this is particularly true for products with a close expiry date.

They are both trying to be more conscious about energy usage and management. Éva pointed out that she rarely starts the washing machine in her household, and only when she has enough laundry to clean, then she starts a washing program. They both use smart devices in their households. While Zsolt uses lights with motion sensors and timers in his home, Éva has bought lights that can be controlled from her smartphone. They also find it essential to buy electronic devices for their homes that use low energy.

They also show a high level of awareness in the area of clothing. Éva does not buy clothes at all. She usually wears her clothes as long as they are in reasonable condition. Zsolt feels the same way about clothes. He says that he used to be an impulse shopper and bought many clothes he did not necessarily need. However, he regularly buys second-hand clothes from online marketplaces, often using the Vinted app, which has been available in Hungary for not long. Besides getting branded, rarely worn clothes at a reasonable price, he also advertises clothes for sale on this platform.

For the male respondent, there are two other areas where there is a high level of awareness, one is financial decisions, and the other is cleaning/sanitation. Zsolt tries to manage his finances as consciously as possible, which is reflected in the fact that he immediately categorizes his salary when he receives it according to the expenses he expects to incur in the given month or period. In addition to these, there are permanent categories that ensure his quality of life, to which he also allocates a fixed monthly amount. He also thinks about what his pension will be enough for, so he also sets aside a specific monthly amount for this purpose.

Zsolt is also very conscious about cleaning products. He has replaced household cleaning products from the shops with ones he can make himself at home. He said that he drinks a lot of lemon water, and instead of throwing away the lemon peel, he collects it, pours vinegar over it, and uses it to clean the bathroom. He has replaced plastic dish sponges with loofah sponges and can use vinegar to clean many areas. Zsolt collects ideas from videos on TikTok for "making" alternative cleaning products that he adapts into his daily routine if he finds them workable. He pointed out that these alternative homemade products take up much less space in the household and are much more economical to use.

For the youngest age group interviewed, it can be said that they do not necessarily consider sustainability when choosing sustainable solutions and alternatives. Financial considerations are essential in their consumption, leading to more sustainable behavior.

4.2. Interviewees aged between 35 and 60 years

In the case of respondents aged between 35 and 60 years, it can be seen that while the female respondent (Krisztina) scored between 6 and 7 on the (1-10) Likert scale in all cases, the male respondent (Szabolcs) scored the maximum value, 10 in all categories. The latter is explained by the fact that Szabolcs indicated that, in his opinion, this method does not measure whether sustainability is essential to someone or not. In his opinion, it is either necessary to someone or not essential, but there is no in-between. He gives the highest value as he tries to be as conscious as possible in all areas of his personal life and his multiple businesses, h The following radar chart (Figure 3) shows the ratings given by respondents aged between 35 and 60. The chart shows the ratings given on a Likert scale from 1 to 10, with the female respondent in red and the male respondent in blue.

Figure 3. Importance of sustainability in purchasing decisions in specified areas among respondents aged between 35 and 60
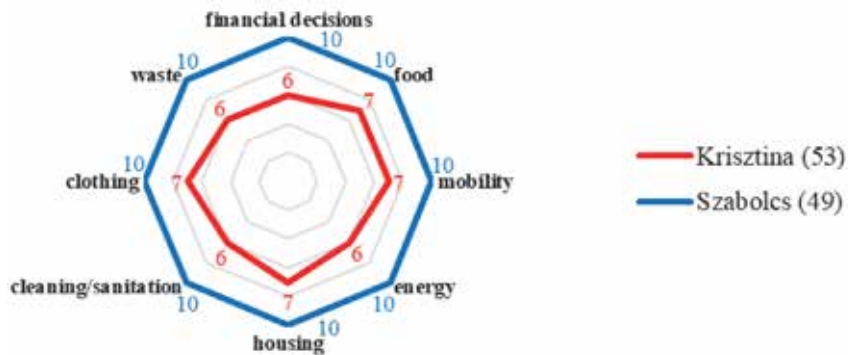
Source: Authors

In Krisztina's case, higher levels of awareness are shown for food, mobility, housing, and clothing when purchasing decisions. She pointed out that although it is difficult to calculate how much food is consumed in the household,

she tries to ensure that she does not hoard food and does not have to throw it away. Similar thoughts came up in Szabolcs's case; he does not hoard food either, and there is no chance for food waste in the household. He also thinks it is essential to choose food that reflects sustainability, for example, the packaging in which the products can be bought.

In mobility, electric cars have made a difference in both of their lives. Krisztina stressed that if she needs to order a taxi, she tries to use the electric option (e-car) if it is available in the city where she wants to use the taxi service. She is also proud that, although there is only one electric car in the family, all the family members prefer to adjust their schedules to use this car to leave home instead of another petrol or diesel car available. In addition to the three electric cars in the household, Szabolcs kept his old internal combustion engine car so that when he had urgent work or emergency, he would have a car in the family to get him going immediately. However, he also explained that he had not had such an unexpected situation in his life for a few years, and when he had one, he preferred to solve it with one of their electric cars. He now prefers to use the electric car in his home country and for international journeys, as he believes he can replace a petrol or diesel car.

Regarding housing, Krisztina said that a few years ago, they had to replace the windows in their house as part of a significant project. They previously had ones made of plastic, and she and her husband thought that if they chose these non-recyclable items now, they would create another large amount of waste in the future. So, after much research, they opted for wooden sash-frames, which, although they are much more expensive, they feel more comfortable now when they are in the house, both because of their love of the wooden material itself and because they know that they have already done something to reduce their ecological footprint. Although Szabolcs considers the spread of electric cars extremely important, he worries about car batteries' future after they lose capacity. He recently thought that when the time comes to replace the battery of his e-cars, he will buy new batteries when he takes his car to the service garage and even buy the old ones and store them in his household. He will store the energy he generates in the old batteries with the solar panels on the roof but does not use it immediately. In this way, he will be able to power their house very economically because the electricity the solar panels generate can be stored in the batteries and used later when needed in the household.

Regarding clothing, Krisztina said that although she loves clothes, she knows it is not suitable for the environment. Increasingly, she buys second-hand clothes from one of the specialized chain stores and avoids colored clothes. In addition to second-hand clothes, she is also brave enough (as she mentioned) to buy clothes that have been recycled. For example, she has several pairs of leather shoes made from previously used and recycled leather. In addition, she donates clothes that are no longer used but in good condition to organizations where people in need can wear them. Szabolcs also pointed out that if his household collects many clothes that he or his family members no longer wear, they are donated to Caritas for charity. He also said that he does no longer buy clothes. For years she bought many clothes he still wears today, and he has enough to last a very long time. He said that he likes to wear clothes with minor stains or even tears, obviously not when he is on official business, but they are suitable for gardening, for example.

Our interviews with respondents aged 35 to 60 found that this is the age group for whom sustainability is most relevant because they are thinking about their children's future and how the next generation can use the Earth's natural resources.

4.3. Interviewees aged over 60 years

In the responses of interviewees over 60 years, most areas show comovement in the scores of female and male interviewees, which means that sustainability is explicitly considered important in purchasing decisions in many areas. Food, energy, cleaning/sanitation, clothing, and waste were the areas where both interviewees scored highest on a scale from 1 to 10. The radar chart below (Figure 4) shows the responses of the interviewees over 60 years of age. The chart shows the scores on a Likert scale from 1 to 10, with the female interviewee (Ágnes) in red and the male interviewee (János) in blue.

Figure 4. Importance of sustainability in purchasing decisions in specified areas among respondents aged over 60
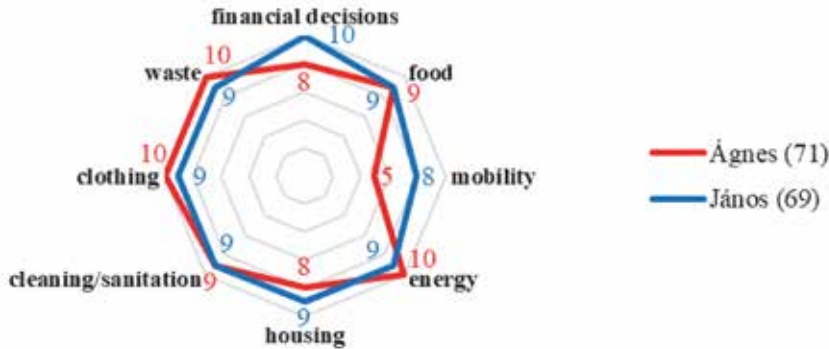
In the case of food, the elderly respondents had extreme opinions. Ágnes said that she had been brought up at home not to throw food away and that she had brought up her children on that basis and was trying to teach her grandchildren the same. She said that she thinks seriously about what she has miscalculated when she throws food in the bin and will shop according to that next time. János stated emphatically that the amount of food thrown away at his household is zero, and he does not understand those who throw food away. Since the COVID-19 pandemic, he has started baking bread, another way to promote sustainability. The latter decision was also prompted by the fact that he and his wife are increasingly dissatisfied with the bread quality and other bakery products in the shops. Stockpiling and hoarding do not appear to be an issue for respondents.

The oldest respondents also show a high level of energy awareness. Ágnes indicated that she had replaced all the light sources in her household with LED technology and considers it essential for people to produce energy for themselves using renewable energy sources. She is also thinking about installing solar panels. János said that he and his wife live in a relatively large house, but he is confident they have no more energy-using devices at home than in an average small apartment. He reminds his wife if she accidentally leaves a light on and teaches his grandchildren the importance of saving energy. He says that as someone gets older, consumption decreases in direct proportion, which is also true for food and energy use.

Ágnes's awareness of cleaning/sanitation is reflected in the fact that she does not use chemicals because she considers them both polluting and ineffective. She regularly uses vinegar to clean windows at home and work, and when she sees all kinds of chemicals in TV commercials, she is always horrified to see what amount of those ends up down the drain. In addition to using soaps and other sanitation products made strictly from natural materials, János stressed the importance of water management within this category. He does not like people running the water for too long, nor does he think having a significant stream of water is necessary every time you turn on the tap.

In terms of clothing, Ágnes noted that she likes to dress up, but she no longer buys new clothes for herself. She prefers to keep her current clothes in a condition she can wear for a long time. She likes to buy second-hand clothes, where she can find unique pieces. She tries to distribute her late husband's clothes to people who are happy with them rather than throwing them away. János stressed the importance of inheritance, indicating that some pieces of clothes are already worn by the third generation in the family. Three males in the family are roughly the same size, so this is not a problem at all, and many items and clothes are given around the family in this way. If he does buy, he tends to buy from outlets because he knows they have out-of-fashion clothes - at excellent prices – which, if people do not buy, are going to an environmentally unfavorable place.

Waste and waste management have also emerged as a critical areas for the oldest generation interviewed. For Ágnes and her children and grandchildren, selective waste collection is also an important issue, which she does very effectively. However, she misses that although she collects separately at a micro level, she does not see it working well on a large scale in landfills and dumpsites. He collects paper, plastic, household waste, and pet bottles separately in his household. János described the separate waste collection as one of his hobbies. The local waste collector provides separate containers at their residence, so he finds it inconceivable to mix up the different types of rubbish. He feels good that he can sort almost everything and will call out his neighbor if he sees that he is not sorting efficiently.

The responses from the oldest age group showed that they perceive the implementation of sustainability in their daily lives as a process that they are

experiencing and trying to pass on to future generations, in their case, not only to their children but also to their grandchildren.

5. CONCLUSION

The initial assumption of our study was that electric car users do not only buy vehicles but also other products mainly for sustainability reasons. We investigated whether awareness is also present in other areas of electric car users' consumption. We have defined the ecosystem where elements have been analyzed separately. The research method chosen was in-depth interviews with subjects organized along generational and gender dimensions. The in-depth interview data show exciting results in several aspects.

On the one hand, the youngest interviewees (under 35) show extreme awareness of consumption decisions in different areas. It cannot be said that people in this generation move together, as none of the interviewees marked the same values for the categories listed, nor is there a correlation between the values marked by female and male interviewees. The middle-aged generation (aged between 35 and 60), although to a different extent, show a more marked comovement. While the female respondent scored just above the median for all categories, the male respondent marked the highest value in all cases. It can be seen that of all the age groups surveyed. This age group is most consistently striving to advocate the importance of sustainability in all areas. For the oldest age group (aged over 60), we can conclude that there is a comovement, albeit not to the same extent, for most of the categories included in the ecosystem. In almost all areas, they scored close to the highest, showing that this age group is also highly committed to achieving sustainable lifestyles.

On the other hand, it can be seen that the three generations have very different views on the use of electric cars and sustainability in general. In the case of the youngest generation (aged under 35), the analysis of the in-depth interviews and the data presented in the survey suggests that they do not necessarily consider sustainability when using electric cars or other products that could be described as alternatives to sustainability. Instead, they choose them for convenience, simplicity, economy, or even their excitingness and trendiness. Among middle-aged respondents (aged between 35 and 60), we perceived that sustainability and the use of products that promote it are essential to them because they are concerned about their children's future. They want to have the same

opportunities for them as they have on our planet. The oldest respondents (over 60) perceive sustainability and its maintenance as a process, which they mostly equate with aging. The importance of the opportunities given to the younger generation is less apparent in their case, but it is undeniable that both are keen to steer their grandchildren toward sustainability.

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LIVESTREAM COMMERCE IN GERMANY - AN EMPIRICAL ANALYSIS OF ADVANTAGES AND SUCCESS FACTORS.

Ann-Christin GLASS, Ph.D.
Pforzheim University, Business School

E-mail: a-c.glass@outlook.de

Kai Alexander SALDSIEDER, Ph.D.
Pforzheim University, Business School

E-mail: kai.saldsieder@hs-pforzheim.de

Abstract

As a result of the Covid-19 pandemic in 2020, a new shopping format developed out of necessity allows for greater personal communication between brands and consumers online. Livestream Commerce (LSC) solves several E-commerce issues and offers many additional advantages, which are being discussed. Although China introduced it in 2016, German firms that want to implement Livestream Commerce are hesitant to adopt the learnings quickly. This hesitation is justified, as this study shows. The current study investigates the German LSC market and is one of the few studies conducted. It distinguishes itself from other international approaches by evaluating practical critical criteria that increase purchase intention. It contributes to recent studies on Social Commerce, customer stickiness motivation, and social presence. The qualitative research consisted of half-standardized expert interviews (n=19) evaluated using qualitative content analysis. As a result, the importance of authenticity, interactivity, exclusivity, conditioning, and social influence are discussed. This paper presents a practical guide to LSC with examples for the FMCG market. Although the study is based on individuals' perceptions and opinions and is thus potentially biased, the diverse background of the experts and the structured approach allow for high data reliability. Future studies may focus on comparing authenticity between corporate Influencers and traditional social media Influencers or analyze the cultural impact and its effect on the us-

age of LSC. Potential future application areas for LSC include the metaverse, B2B, and recruitment.

1. INTRODUCTION

To illustrate the potential of Livestream Commerce (LSC), the development of the Chinese market is portrayed in the following. When Alibaba, a Chinese retail giant, entered with its Taobao Live Software Chinese E-Commerce market in May 2016, a new chapter of E-Commerce started: Livestream Commerce. It allows instant shopping during live streams due to countrywide 4G technologies and a mobile-commerce and -payment boom in China in 2015. This opportunity was capitalized, and Taobao's live shows created conversion rates of 50% in 2017 (Arvato, 2022). It developed quickly, and for Chinese Singles Day, the Presales Campaign in 2020 created a transaction volume of $7.5 billion in the first 30 minutes (South China Morning Post, 2020). Notably, in 2020, two-thirds of Chinese consumers purchased through Live Shopping in the last 12 months, as an AlixPartners Study (2020) shows. This new marketing method spread in use, especially during the outbreak of Covid-19 in 2020, as retailers and brands needed to find a way to represent themselves online personally while remaining visible to customers (Lee & Chen, 2021; Statista, 2021). In Europe, the pandemic also accelerated the adaption of Live-Stream Shopping, and live events increased from 3% to 28% within one year from Q4 2019 to Q4 2020 (Arvato, 2022; Forrester, 2021).

However, in 2021 only 5% of young customers in Germany used Livestream Commerce, with 67% not knowing about this format (IFH KÖLN, 2021). Therefore, it offers enormous potential for market growth in Germany. This format may remind consumers of teleshopping in Germany due to its shopping show character, but its interactivity is a crucial differentiator that distinguishes Livestream Commerce from Teleshopping. Douglas, an early adopter in the German retail market, collaborates with the live-streaming software provider Livebuy. Douglas achieved in December 2020 a conversion rate of up to 40% and multiplied its sales during the streaming time, and increased its share of

younger customers by 14% (Gode, 2020). Live Shopping software is distinctive in Germany because social media apps like Instagram implement a shopping function, but no mobile payment service is included. This means the consumer is referred to the website for the actual purchase. This transference leads to a longer customer journey and increases the risk of losing the consumer, which is reduced on E-Commerce pages. Additionally, social media does not allow parallel interaction, streaming, and browsing of products to the extent of E-Commerce websites. Thus, the research conducted in this study refers to E-Commerce websites as the channel of LSC.

Despite its increasing usage in Europe, research on Livestream Commerce has not gained the attention needed (Sun et al., 2019; Wongkitrungrueng, Dehouche, & Assarut, 2020). Neither has a study evaluated the success factors of Live Shopping in Germany due to its novelty and low public awareness. As the trend emerged from China, Asian studies dominated the research, and especially studies of the German Live Shopping market are rare (Baersch, Richard, & Siepermann, 2022). Consistent with this finding, this study aims to explore the advantages and success criteria of Livestream commerce in Germany. Especially inexperienced retailers, but also those starting with Livestream Commerce, need to know critical considerations when implementing Livestream Commerce into their marketing mix. Therefore, the main research question (RQ) is:

RQ: What are Livestream Commerce's advantages and success components in Germany?

2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

2.1. Definition of Livestream Commerce

The following, Live Commerce, Live Shopping, and Livestream Shopping, describe the real-time online interaction over the brands' website stream between the presenter and the watchers. It combines social interaction as chat or emoji reaction with an instant purchase opportunity to stimulate purchase intention.

Current definitions (e.g., Liu et al., 2022; Haimson & Tang, 2017; Wang et al., 2022: 2; Xue et al., 2020) emphasize real-time communication and the development of an interpersonal connection to stimulate consumers' purchase

intention. The interaction possibilities motivate user interaction; hence the selling process can be facilitated to address consumers' needs better. According to Greenwald (2020), the value-added consists of the virtual presence of the streamer, trying on the products, and suggesting ways to use and combine them besides the live interaction.

In contrast to TV Home Shopping, also called Teleshopping in Germany, LSC offers multi-way communication between the live-streamer and consumers and enables consumer-to-consumer interaction through chat. Hence, a significant level of trust can be generated, and a well-known host is likely to lose credibility for recommending a defective product (Forrester, 2021).

Comparing LSC to the term 'Social Commerce', which describes commercial activities and streaming on social media, LSC takes place on E-Commerce Pages. Due to its social interaction similarity, it needs to get differentiated. Huang and Benyoucef (2015) stated that consumers visit social networks to socialize and e-commerce platforms to shop. This leads to the conclusion that commercial activity is still traditionally more successful on E-Commerce websites and not on social media. Therefore, this study focuses on LSC on brands' E-Commerce websites, not on their social media.

2.2. Analysis of Success Factors in Literature

Before analyzing success factors, the advantages LSC offers the brand must be discussed. An analysis of McKinsey Digital (2021) points out that the vice of Live Shopping regarding the Customer Decision Journey is that it shortens the process, enables skipping the Information and Evaluation phase, and reduces the time spent on decision-making. This was also proven by Xue et al. (2020) as high interactivity and forming of a social relationship decrease perceived risk, increase engagement, and accelerate purchase decisions. To identify further advantages for the German LSC market, the following research question will be answered:

RQ2: What are the advantages for firms using Livestream Commerce?

Although the consumers' perspective on online shopping challenges is already evaluated in many market research studies (Statista, 2021; Nielsen, 2022), the format of LSC's market adaption is still growing. Contrarily, in

America, sales of 17 billion US$ within 2022 and a market adaption of 51% as of June 2022 were achieved (Statista, 2021: 23-24). However, Social Commerce, such as Facebook Lives, accounts for most sales, which is not replicable in Germany due to technological restrictions. Thus, challenges for firms that want to implement LSC must be considered. This finding leads to the following research question:

RQ3: Which key challenges do firms see when implementing Livestream Commerce?

In order to understand the consumers better, a literature analysis of consumer behaviour was conducted. Interest in E-Commerce Livestream in Europe is the highest in the categories of Electronics (40%), Fashion (36%), and Cosmetics (32%), preferably on E-Commerce platforms, followed by social media (Statista, 2021: 30-31). The most important motives for shopping online are free delivery, rebates, and simple returns (We Are Social Germany, 2022). Additionally, Nielsen (2022) proves that consumers trust brand websites more than Ads on TV or product placements from influencers. This potentially increases purchase intention for LSC. The following research question is formed to compare these findings with the experiences from specifically the German market.

RQ4: What do you need for a successful Live Shopping Event?

A European Study detected that 10 minutes is enough for consumers to gather all relevant information (Forrester Research, 2021). As no literature has answered the question of which frequency and duration is best for LSC yet, and time frames from China with about 4 hours per stream differ significantly from one hour average in Germany, the study aims to answer the following research question:

RQ5: Which time frames are the most popular, and what has to be considered when choosing a day or time to stream Live Shopping in Germany?

Given that Livestream Commerce originated in China, it is unsurprising that literature from Asia dominates the field. However, Baersch et al. (2022)

contributed as a first study of the German LSC market to the literature review. The limitation of adopting Chinese findings due to cultural differences is discussed at the end of this chapter. In line with former studies, interaction, social influence, and price incentives are evaluated as success factors for Livestream Commerce.

2.2.1. Livestream and Interaction

Interaction can be defined as the degree to which users influence the outcome or content (Steuer, 1992). Therefore, it is a "two-way communication [which] refers to the ability for reciprocal communication between companies and users and users and users" (Liu & Shrum, 2002: **55**). Thus, how retailers allow consumers to communicate and to what degree consumers feel heard are overriding measurements (Baersch et al., 2022: 5).

Several studies have previously investigated the value of interaction in the live-stream context (Jung et al., 2017; Polo et al., 2016). It has positively impacted engagement, intention to use (Ma, 2021a), and relationship quality (Zhang et al., 2016; Ou, Pavlou, & Davison, 2014). This generates trust between the seller and consumer, increasing social shopping intentions (Chen & Shen, 2015).

Supportive behavior among consumers also impacts the judgment of the service quality and, thus, customer satisfaction (Jung, Yoo, & Arnold, 2017; Wongkitrungrueng et al., 2020). Wang et al. (2019) also found that hedonic values as enjoyment benefit from interactivity. This, in return, decreases perceived purchase risk and increases trust toward the E-commerce seller again (Addo, Fang, Asare, & Kulbo, 2021). Addo et al. (2021) also highlight that those social components, as given in Livestreaming, stimulate purchase decisions and non-transactional benefits such as followership, which may decrease the need for price incentives.

Consequently, it leads to the assumption that interaction in LSC settings increases purchase intention. Since several studies have identified its importance (Wang et al., 2019; Wongkitrungrueng et al., 2020), this paper will focus on practical applications. Therefore, the following research question is formed.

RQ6: How to increase interaction most effectively to activate consumers?

2.2.2. Livestream and Interpersonal Influence

Notably, when consumers know the influencer, purchase intention increases as they trust the influencer's opinions (Nielsen, 2022). They have, especially on the shopping behavior of Gen Z (18+ years), a significant impact (Faktenkontor, 2022; Dillmann, 2022; McKinsey, 2021). Regarding the authenticity and influence of Influencers, a Nielsen study (2022) has shown that 71% of consumers trust advertisements, opinions, and product placements from an Influencer when they follow them on social media. They also remember the brands advertised, and purchase intentions were 9% higher than those of the advertisement's non-recipients. Additionally, Liu and Wang (2022) found that Influencers improve consumers' purchase intention due to social presence and a positive feeling of community. They propose that streamers need a complete understanding of the products to reduce consumer uncertainty (Liu et al., 2022:17) and drive stickiness intention (Baersch et al., 2022: 11). Especially older consumers seem to be more prone to the influence of social presence as they "require greater involvement from their social networks to adapt to new digital services" (Baersch et al., 2022: 11). Significantly, users in Germany are more mature than in China with an age range of 32 to 43 years in contrast to mainly younger millennials in China (Forrester Research, 2021). This leads to the conclusion that LSC offers a broad user group; hence different interpersonal influences must be considered. The following research questions are formed to identify the importance of the streamer:

RQ7: What role do Influencers have in the success of a Livestream? What characteristics do Influencers or branded broadcasters need?

2.2.3. Livestream and Price Incentives

According to Garnefeld et al. (2013), monetary incentives improve the intention to participate in live streams. This was confirmed by Liu et al. (2022) and also increased social presence. Social presence is the "degree of other people's salience in interactions and the consequent salience of the interpersonal relationship" (Short et al., 1976: 65). It refers to online communication to the feeling of enjoyment when interacting (Hassanein & Head, 2007). Thus, social presence may decrease the psychological distance between the seller and the consumer and increases intimacy. This again enhances consumers' stickiness with the retailer (Chen et al., 2022; Ou et al., 2014). The formation of this

intimate relationship affects consumers' purchase intention in the Livestream context (Ma, 2021b). Additionally, impulse buying is significantly stimulated by promotions, time pressure, and aesthetic and social interaction (Huang & Suo, 2021).

However, Baersch et al. (2022) examined the German LSC market and found that functional values are the main drivers for customers' stickiness intention. Hence, enhancing informativeness (Liu et al. 2022: 17) as preparing the live seller well with product details is decisive. Hsu and Lin (2021) also proved that informativeness increases the intention to use and the conversion rate (Liang, 2021). To dive deeper into the value and need for price incentives in Germany, which has never been researched in the context of LSC before, the following research question is formed:

RQ8: What importance do price incentives have during the live shopping show for attracting customers?

2.2.4. Cultural Differences in LSC between German and Chinese Consumers

First, the reason for using LSC differs between the two markets. In China, consumers aim to decrease stress while watching live streams (Chen & Lin, 2018) and are entertained by the shows (Wang et al., 2019) besides seeking to gain a rebate (McKinsey, 2021). However, Baersch et al. (2022) examined that German consumers prefer functional values over hedonic ones. As Singh and Hill (2003) further differentiated, privacy and its protection are crucial to German consumers. An important distinction is the time and duration between German and Chinese LSC. As Greenwald (2020) noticed, an average Live streamer in China presents about 12 products an hour, resulting in about 48 products per night. The most famous example in China is Austin Li, the 'Lipstick King' who sold more than 145 million US$ on Singles' Day 2020 in China (Zhou et al., 2021). Chinese streamers negotiate with brands to get the lowest prices, as consumers can change the streams and buy identical products from another streamer for less (Greenwald 2020). To verify previous research findings on adaptability, the following research question is formed:

RQ9: Can learnings from Chinese Livestream Commerce be transferred to Germany?

Finally, the following research question is identified to assess the future development and managerial application of LSC in Germany to build on previous knowledge.

RQ10: What role will Livestream Commerce in Germany have in the future?

3. RESEARCH DESIGN AND DATA COLLECTION

3.1. Research Design

The research model is based on the Stimuli-Organism-Response (SOR) theory, which evaluates the effect of environmental stimuli on a defined consumer response and was initially developed by Mehrabian and Russell (1974). Previous studies on online shopping behavior and LSC have used it before to identify relevant influencing factors such as interaction (Xue et al., 2020) and social influence (Chen et al., 2022). In this case, the stimulus (S), the Firm's intention to use Livestream Commerce, depends on the variable opportunities, threats, and pandemic influence. They decide whether the Firm will pursue LSC and impact the internal state of the Firm, the organism (O). Traditionally, the organism involves the perceptions and experiences of the consumers (Sautter, Hyman, & Lukosius, 2004).

However, as this study focuses on how to apply LSC from a brand perspective, the brand's capabilities are the company's organism. The influencing factors refer to the computer-mediated communication interactivity model, which points out the importance of interactivity and social influence on the satisfaction of the consumers (Baersch et al. 2022: 4). About the literature review, social influence, interactivity, and functional value as price incentives are key brand capabilities. If these are met, the Firm significantly influences the consumer's response (R), which is the increase in purchase intention.

Regarding the impact of culture on purchase intentions in online shopping (Yang & Jolly 2009; Hofstede 2011), the research design integrates the importance of availability, culture, and unknown factors for consumer purchase intention, further referred to as "Consumer's Black Box".

Figure 1: Research Model, own illustration
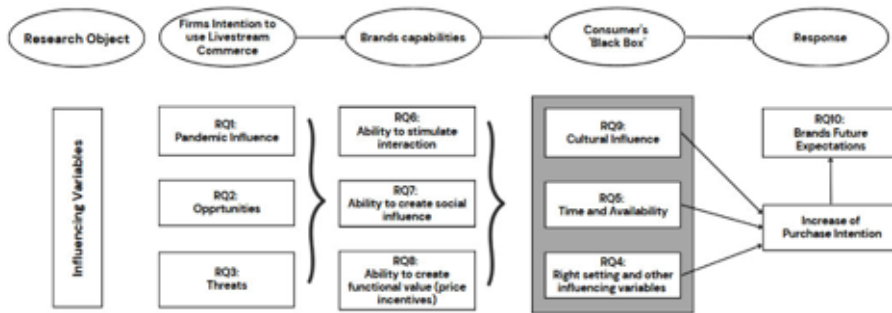
3.2. EXPERT SELECTION, INTERVIEW STRUCTURE AND EVALUATION METHOD

The research design is a systematic expert interview method (Bogner, Littig, & Menz, 2014). According to Gläser (2010: 41), for a certain degree of flexibility, the interviews were half-standardized to ensure an authentic conversation (Tausendpfund, 2020: 287). Based on the recommendations of Berge (2020), the following criteria were established:

- working for a company managing the Livestream
- or the company itself is producing Livestream Software
- or has relevant experiences for the study in similar areas
- able to communicate in German or English
- necessary to work for the German market
- available during the timeframe the month of July 2022 for a 30-minute interview

The following interview experts were selected:

Figure 2: Expert Selection Overview

Code	Category	Size	Segment
I 1	Platform	middle	LSC Provider
I 2	Platform	middle	LSC Provider
I 3	Platform	middle	LSC Provider
I 4	Platform	small	Cooperation with Live Software, Advertising LSC
I 5	Agency	middle	Full-Service Media Agency

Code	Category	Size	Segment
I 6	Agency	small	China expert, consultant live shopping
I 7	Agency	small	Teleshopping, LSC
I 8	Agency	small	B2B Marketing Agency
I 9	Agency	middle	B2B IT Services
I 10	Agency	small	Influencer Consultant
I 11	User	big	Jewellery Retailer
I 12	User	big	Retailing of Fashion and Cosmetics
I 13	User	middle	Cosmetics
I 14	User	big	Cosmetics
I 15	User	middle	Cosmetics
I 16	User	small	Breakfast
I 17	User	small	Cosmetics
I 18	User	small	Fashion
I 19	User	small	Fashion

The experts were categorized according to their relation to live shopping. Selected Participants were 'Providers' of the software (I 1-4) or agencies helping companies step into Livestream shopping (I 5-10). These agencies give pertinent insights for the study as they have many clients starting with live shopping or sharing relevant other experiences for the study. Other selected experts were social media managers in similar positions for their B2C companies, and thus selected as early adopters of LSC in Germany, considered in the following as 'Users' (I 11-19).

The average length of the qualitative expert interview was 35 minutes, ranging from 15 to 58 minutes. The interviews were conducted and recorded via Microsoft Teams between July 4 and 28, 2022. In advance, participants were given an interview guideline to prepare relevant information. Furthermore, data anonymity was promised and checked if the participant agreed with the voice recording (Bogner et al., 2014: 89). To decrease misunderstandings and test the interview guideline for suitability (Langusch, 2004), a pretest was conducted on July 2, 2022. The interview results were analyzed using qualitative content analysis (Bogner et al., 2014: 72) to provide 'inductive category formation' (Mayring, 2000: 3–4). The Open Access Software "QCAMap" was applied for coding and evaluation, and a research triangulation was conducted.

4. RESULTS

The findings offer insights into four categories of executive action for LSC along the research model:

4.1. Firms' Intention to Use LSC

The experts agreed that the pandemic significantly influenced shopping behavior and pushed the use of online shopping formats. This result from RQ1 validates findings from the literature review (Bhatti et al., 2020; Hubspot, 2022; IFH KÖLN, 2021; Wongkitrungrueng et al., 2020).

Regarding RQ2, experts' opinions vary regarding the advantages of LSC, but 15% name the interaction as a primary benefit, as it offers excellent potential for conversion. The second highest response was that customer relationships could be formed more efficiently (11%), which leads to a more incredible feeling of social presence and trust, which importance was discussed previously in this paper (Liu et al., 2022; Baersch et al., 2022). Further mentioned were the shortening of decision journeys as in McKinsey Digital (2021) and the cost savings due to the reutilization of the created content.

For RQ3, Low public awareness, the comparison to traditional teleshopping, lacking mobile internet connection in Germany, as well as a low reach of own network, lack of financial and human resources, and fear of mistakes are the most common challenges for firms to face in German LSC. Significantly, regularity needs to be created to habituate consumers.

4.2. Brand Capabilities and influencing success factors

As discussed, Livestream can significantly enhance the consumer's purchase intention. Accordingly, the second category of results refers to the field of Brand Capabilities, as interaction (RQ6), interpersonal influence (RQ7), and role of price incentives (RQ8).

Interaction has been evaluated in previous studies as having a significant impact on purchase intention (Xue et al., 2020; McKinsey, 2021), as it decreases perceived risk and increases engagement. The interviewed experts for RQ6 agree that authenticity, personalization, entertainment, and little challenges enable interaction and generate trust.

Additionally, critical criteria for establishing an interpersonal influence and, thus, a social presence were analyzed in RQ7. As mentioned, social presence is a crucial driver for stickiness intention and leads to higher purchase intention (Liu et al. 2022; Baersch et al. 2022). Furthermore, the preference of German consumers for educational content (Liu et al. 2022: 17, Baersch et al. 2022;

Liang, 2021) was confirmed by the experts, as giving relevant information and having product expertise were essential to reduce consumer uncertainty. Hence, experts agreed that combining influencer and employee may be a good choice, as reach and expertise are given simultaneously. This result supports findings from Forrester (2021), which states that local product experts are most favored, followed by social media Influencers – which answers RQ7.

Moreover, the role of price incentives was evaluated in RQ8. Most experts agree that price incentives definitely increase purchase intention due to the motive of exclusivity and scarcity. This finding aligns with previous research (YouGov 2021; Liang et al. 2021; Huang and Suo 2021; Liu et al. 2022), as consumers have shown in international studies to prefer discounts the most as a motivation to use LSC, followed by product need and exclusivity. However, habituation to discounts can harm the brand significantly when the premium image may be affected. Alternatives for exclusivity are competitions, exclusive hosts, education, and raffles.

4.3. Success Factors for the Consumer's Black Box

As the necessary brand capabilities were evaluated before, the consumers' preferences ultimately decide the purchase decision. Referring to the literature review, cultural influence (RQ9), time and availability of the stream (RQ4), and other influencing success factors, which have not been identified before (RQ5), were investigated.

The findings from RQ9 have shown that Chinese consumers have significantly higher technological curiosity and trust than German consumers, who are more risk-averse. They require authenticity to trust and form personal connections. This aligns with findings from previous literature (Cyr et al. 2008; Wang et al. 2019; Statista 2020; Baersch et al. 2022). Nonetheless, this consideration of the transferability of research is unique in the field of LSC. Noteworthy is the different perception of LSC in China, where it is seen as a form of entertainment. German consumers, in contrast, compared to traditional teleshopping, which is very sales-centric. This makes transference of go-to-practices difficult.

The findings from RQ5 offer new practical insights, as the timing and frequency of LSC have not been investigated in Germany before. Due to lacking quality mobile network connections all over Germany, peak live streaming time

is between 6 and 8 pm, when consumers have arrived home from work, and especially Tuesdays and Thursdays are popular. Nonetheless, streaming time depends on the topic and the customer segment. It is generally advisable to use peak website traffic as a reference for availability. Brands need to create consistency, for instance, every two weeks. With only limited resources, a seasonal collection approach is beneficial.

Furthermore, having a monthly theme is essential. Regarding the ideal stream duration for German consumers to stay interested, a maximum of 30 minutes is advisable, similar to the 10 minutes proposed by Forrester (2021). To ensure further attention, the stream needs to get advertised about three to five days in advance.

The RQ4 was aimed to test for central repeating themes and asked openly to avoid a bias in the answer. The findings show that exclusivity is, again, crucial. Additionally, adequate stream advertising and consistency are essential throughout all marketing channels for a reasonable conversion rate. Lastly, authenticity is crucial for success and, thus, the most essential component. Nonetheless, the brand should always allow flexibility to remain authentic.

4.4. Future Expectations

Lastly, RQ10 combined the insights on consumer perception and necessary brand capabilities to form a future outlook on the German LSC market. The study has shown that LSC answers consumers' demand for video and authenticity, and its role is to support the physical experience in store for higher personalization, which confirms findings from Forrester (2021) and Arvato (2022). Other application areas may include recruiting, B2B, and the metaverse, which future studies may concentrate on.

5. MANAGERIAL IMPLICATIONS

This study shows that LSC is a promising retail channel with great potential. It answers consumers' demand for video content, higher brand interaction, and authenticity. When acting now, brands can benefit the most and inspire customers with an innovative way to purchase and interact. The following analysis constitutes critical criteria for adequately implementing LSC in FMCG markets.

First, authenticity is central. Whether it is regarding the choice of the presenter, the presentation, the location, or the content of the stream, it needs to be authentic to build a personal connection and stimulate purchase intention. Especially with German consumers, who are more skeptical and risk-averse than the Chinese, trust and authenticity play a fundamental role. The same applies to the host, whether an employee or an Influencer. He needs to have the brand fit and expert knowledge of the products.

Second, it is all about interaction. Giving easy tasks or questions at the beginning of the live show motivates the consumer to participate and increases social presence, which affects purchase intention again. Equally, games, surveys, and challenges during the stream increase the average watch time. A convincing product display and giving relevant information about the product are significant for German consumers.

Third, having a substantial reach is crucial for the success of the stream. Exclusivity creates interest and can be implemented by welcoming an exceptional host, displaying a limited or new product, or offering a discount. Notably, to ensure high reach, the stream needs to get promoted on the website, in social networks, and in newsletters three to five days before the stream starts. Additionally, the reach benefits significantly when using an Influencer, but brand fit and conversion rate should be the primary selection criteria.

Fourth, this study has also evaluated critical criteria for the presenter. As mentioned already, authenticity and expert knowledge are crucial. Entertaining the watchers of the stream while giving information and background stories of the product are further recommendations. The streamer needs to be charismatic and entertaining to establish a personal connection with the audience. Training is advisable, and the presenter can be internal, as an employee from product development or retail, or external, for instance, a social media Influencer. They create value by being live and are experienced with product displays and entertaining the customers—however, not all brands like to give their representatives full ownership over the stream. Thus, combining a product expert and an Influencer allows for obtaining the best of both the reach and expert knowledge. If the company is only starting, it is also an excellent opportunity to first use an employee before contacting Influencers. Besides, details like background music, water for small breaks, and support from a backend person can help make the streamer more comfortable. It is recommended to answer the questions in

a personalized manner from the backend person to make the consumers feel heard, contributing to the social presence.

Noteworthy for the presentation is not to seem too sales-centric. A more decent attitude should be applied, like nudging the consumers into buying. Otherwise, the prejudice of teleshopping, which is perceived as old-fashioned, will transfer onto Live Shopping. Discounts are effective for leading to purchases but must be applied carefully, as habituation to price reductions can harm the brand. Other alternatives to discounts are surveys and challenges. An educative presentation of a product and its background story creates meaningful value, as German consumers prefer functional and educational value to entertainment only.

Fifth, Livestream is no one-time wonder. As with other marketing tools, a successful adaptation requires frequency and timing. This also means that the brand needs the endurance to develop this format. Regarding the ideal streaming time, the peak time for beauty, fashion, and cosmetic brands in Germany is Tuesday and Thursday from 6 to 8 pm. The brand can also derive the most suitable time frames from the primary traffic on its website. Thirty to forty minutes is advisable to keep the consumers interested, allowing for discussing a specific topic more extensively.

To summarise, Livestream Commerce offers excellent potential in Germany as online shopping is increasing, and consumers expect higher interactivity and social presence of the brand. The LSC concept must be integrated into a company's marketing strategy to establish a competitive edge. LSC offers a variety of benefits: A new distribution channel is created, which enables direct consumer interaction. For product development purposes, firms have the advantage of being so close to the consumer that they can evaluate very early whether a product will sell well or requires adjustments. This valuable feedback from LSC can be used to estimate the market volume and market potential for products from an early stage on.

Further customers can be acquired, as the channel appeals to different age groups, depending on content and host. Cost can be saved by reusing the produced content for other purposes, like ad campaigns and product detail pages. To conclude, Livestream Commerce allows brands to get close to consumers and create a connection beyond rebates and famous Influencers.

6. LIMITATIONS

Research and findings are limited to the German market, and future studies require a greater sample size to discover the strength of each mentioned influence.

With its qualitative method, the researcher bias may have influenced the participants, and some participants may have been inclined to portray the research topic favorably or were distracted by personal influences, leading to incomplete sharing of opinions.

Although only six experts were categorized as "Users", the experiences of the interviewed platform owners and media agencies are vital. These individuals provide advice and daily monitoring for numerous brands on LSC, contributing to the reliability of the initial findings. The applied content analysis method also has drawbacks, as the conversation breaks into pieces and isolates the background story: the researcher-triangulation and the data quality control criteria aimed to improve these shortcomings. However, counting the themes per question did not result in a clear hierarchy of importance. Rather,d the re-occurring themes overall allowed the formation of critical success criteria. To conclude, the authors intend to conduct a more thorough reliability analysis and discover the strengths of cultural impact on this emerging marketing channel.

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THE EFFICIENCY OF CROATIAN INSURANCE COMPANIES IN MOTOR VEHICLE LIABILITY INSURANCE

Ticijan PERUŠKO Ph.D.
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković" Pula

E-mail: tperusko@unipu.hr

Gorica KARLOVIĆ, student
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković" Pula

E-mail: gorica.karlovic@student.unipu.hr

Abstract

The main goal of the research is to analyze the efficiency of Croatian insurance companies in motor vehicle liability insurance. Research has explored overall efficiency and efficiency by segmenting life and non-life insurance in insurance companies in the Republic of Croatia. This paper researches efficiencies within the non-life group of insurance. Through the analysis and application of the DEA methodology and BCC model, insurance companies' efficiency levels in motor vehicle liability insurance were compared to the market share.

Due to its more general presumptions, the BCC model is closer to real-world business, which is why it is applied in the research. In selecting the BCC model orientation towards input or output, the reviewed literature recommends the input orientation because insurance companies significantly influence inputs more than outputs. The inputs in the model are business expenses, which consist of acquisition and administration costs and insured event costs. Earned premiums are the principal income from the insurance company business, so they are taken for the model output.

The analysis encompasses active insurance companies which operated in the motor vehicle liability insurance segment in the Republic of Croatia between

2016 and 2021. The research showed that two of three insurance companies with the highest shares in the earned premium realized total efficiency in these years, while one insurance company fell in the last year. In insurance companies with low market shares, only one was thoroughly efficient in all years, proving that the scope of business in this type of insurance affects the efficiency level. The results are compared to the efficiency of non-life insurance in the analyzed insurance companies. By comparison of the average annual efficiency of insurance companies, a declining trend is noted in motor vehicle liability insurance. In the last analyzed year, average efficiency fell under the level of efficiency of non-life insurance, which, on the other hand, was also affected by an increase in the efficiency of non-life insurance.

Keywords: *DEA, insurance companies, motor vehicle liability insurance, business expenses, earned premium, non-life insurance, claims paid*

JEL Classification: *G22, M41, C61*

1. INTRODUCTION

The insurance business is specific due to its services to policyholders, including risk transfer from the insured person to insurance companies. Insurance companies offer a wide range of products to individuals and business subjects and also have an essential role in financial mediation, contributing to financial and overall economic development (Karim & Jhantansana, 2005). Based on a concluded contract, the policyholder must pay the insurance company a monetary sum defined in advance. In contrast, the company must pay a monetary sum for repairing damage incurred by an insured event (Wang, 2001). The agreed monetary sum for risk transfer is called gross premium and represents the most significant income in the insurance business. Earned premium is calculated by correcting gross written premiums for adjustment and charged adjustment of the premium value for premiums passed in reinsurance and change of transferable premiums.

Contracting insurance, i.e., the sale process, is carried out through internal and external suppliers who, as a rule, receive a commission per agreed type of insurance. This is why groups of acquisition costs and administration costs show business expenses in insurance companies. Commission and other acquisition costs are shown separately under the acquisition costs, while all costs created outside the sale process are included in administrative costs. From this point

of view, acquisition costs depend on the scope of sales, from which arises their variability as opposed to administration costs, which are not dependent on sales activities. Administration costs include the costs created for portfolio management, expenses for staff who do not work in insurance sales, and other material and non-material expenses (Žager et al., 2008: 322). Business expenses and expenses for insured events have the most significant share in total expenses and, thus, the greatest influence, from the expenditure side, on insurance companies' business performance.

The efficiency of insurance companies is crucial for their survival. Efficient use and allocation of input and output are essential for the maximization of profit and minimization of expenses (Učkar & Petrović, 2022: 50). This is why an increased number of research are directed toward the measurement of efficiency of the insurance industry in a micro level through a comparison of insurance companies and at a macro level through a comparison of the insurance system at the country level (Škrinjarić, 2017: 4). Despite numerous analyses, as far as we HRKow, an analysis of efficiency of motor vehicle liability insurance in Croatia has not been carried out, and this is why the focus of this research is on this very type of insurance. This type of insurance has a considerable share in total earned premiums in the Republic of Croatia. In the analyzed period between 2016 and 2021, the share in total earned premiums varied, ranging between 37% and 47%. The data for the conduction of the research is taken from the published insurance companies' financial reports, Hanfa and the Croatian Insurance Bureau. It should be emphasized that financial reports are the primary source of accounting information that is used in the measurement of efficiency of financial institution performance through an analysis of the relationship between specific values, generally accepted as efficiency indicators (Jurčević & Mihelja Žaja, 2013: 204).

The main goal of the research is to analyze and compare the efficiency of motor vehicle liability insurance in insurance companies in the Republic of Croatia. As in the Croatian insurance market, only ten insurance companies deal with motor vehicle liability insurance, which makes a sample for econometric models too small, so DEA analysis was applied. Efficiencies between insurance companies were analyzed to determine efficiency levels compared to market shares. Following this, the efficiency of insurance companies in motor vehicle liability insurance was compared with the efficiency of non-life insurance. The paper aims to, by application of scientific methods, obtain information for defining

and describing efficiency in motor vehicle liability insurance in insurance companies in Croatia. Furthermore, the research opens new possibilities for exploring efficiency by types of insurance and influence on the overall efficiency of insurance companies.

2. LITERATURE REVIEW

In their paper, Eling and Luhnen (2010) reviewed the conducted research on efficiency and comparison in the international insurance industry in thirty-six countries. The research results were obtained by comparison of different methodologies, organizational forms and company sizes and point to a permanent growth in technical and cost-aspect efficiency in international markets with significant differences among the analyzed countries. Cummins and Weiss (2013) reviewed developed methodologies for efficiency and productivity analysis with an accent on the application in the insurance industry. They concluded that over 59.5% use DEA analysis as the primary methodology. Kaffash and Marra (2017) directed their research toward DEA models and their application in financial services. In their work, they studied 620 relevant papers that applied the DEA method and grouped them in banking, funds and the insurance industry.

By applying the DEA methodology, Cummins and Xie (2016) estimated the cost, income and profit efficiency of American property insurers between 1993 and 2011. The results showed that the property insurers in the USA had improved their efficiency and productivity during the observed period. Baros and Wanke (2016) studied the efficiency drivers in the Brazilian insurance industry. They proved that the results confirm the theory that the largest insurance companies are among the best in efficiency. In his paper, Škrinjarić (2017) analyzed the efficiency of insurance companies in 29 European countries between 2004 and 2013. The author proved that there are significant differences between efficient and inefficient companies and gave guidelines for improvement of the insurance industry in the analyzed countries. Žaja, Anđelović and Kedžo (2018) also conducted an efficiency analysis in the European Union. The results showed that fourteen out of 26 analyzed European Union countries, including Croatia, were above the average in efficiency.

Medved and Kavčić (2012) researched the efficiency of Croatian insurance companies. Using the DEA method, the authors explored insurance efficiency in Croatia and Slovenia between 2006 and 2010. By research, it was proved

that, on average, insurance companies in Croatia operate more efficiently than insurance companies in Slovenia and that insurance company mergers and takeovers positively affect the growth of efficiency. The following efficiency research in Croatia was prepared by Jurčević and Žaja (2013). The authors conducted measurements using the DEA method and accounting indicators, and they compared the results of the efficiency of banks and insurance companies in the period before and after the outbreak of the financial and economic crisis in Croatia. Their research was followed up by Učkar and Petrović (2022), who explored efficiency levels concerning the size of insurance companies in Croatia. The results showed that big insurers achieve above-average ROI, ROE and ROA values and below-average proportions of damages, costs and debt.

Kramarić, Pervan and Ćurak (2022) researched the determinants of company efficiency for non-life insurance in Croatia. Eighteen insurance companies were explored using the DEA analysis and truncated regression, and the research results prove that age and ownership affect the efficiency of non-life insurance companies. The same authors researched the efficiency of life and non-life insurance efficiency before and after Croatia's accession to the European Union, pointing to an increase in total technical efficiency in the life and non-life insurance sector after Croatia acceded to the European Union.

3. RESEARCH METHODOLOGY

The DEA analysis is a non-parametric method that calculates the efficiency of the decision-making unit (DMU) with the application of linear programming. This method's output data is expressed in percentage values up to 100%, where the DMU that reaches 100% is considered fully efficient and represents an example of good practice in combining input and output. Efficient DMUs make an efficient limit for calculating efficiency measures concerning other DMUs in the analyzed sample.

There are two DEA analysis models, namely a CCR model, established on constant returns and a BCC model, established on variable returns. By comparing the presumptions on which the models rest, it can be noted that the CCR model applies constant returns, and, in the real economic world, it is not expected that all inputs and outputs will be proportionally changing. From that point of view, the BCC model is more flexible as it presumes variable returns (Pervan et al., 2021: 74). Thus, the CCR model evaluates total technical ef-

ficiency, while the BCC model evaluates pure technical efficiency. Furthermore, the model orientation can be towards input, where input is minimized with unchanged output, towards output, where output is maximized with unchanged input and a non-oriented model, where inputs and outputs are simultaneously improved (Kramarić et al., 2022:152).

In the research, the application of the DEA analysis is chosen as it can be used on a small sample, it can measure relative efficiency with more inputs and outputs and, as a non-parametric method, does not require previously defined specific function shape (Pervan et al., 2021: 74). Due to its more general presumptions, the BCC model is closer to real-world business, which is why it is applied in the research. In selecting the BCC model orientation towards input or output, the reviewed literature recommends the input orientation because insurance companies significantly influence inputs more than outputs. Elling and Luhnen (2010), Medved and Kavčić (2012) and Cummins and Xie (2013) advocate such a presumption in their papers, while the research by Cummins and Wess (2013) shows that most efficiency analyses in the insurance industry are oriented towards inputs. The selection of inputs and outputs was in line with the literature which explores the area of efficiency in the insurance industry. According to some authors (Golany & Roll, 1989), the recommendations concerning the number of input and output units should be less than half as many as the analyzed DMUs, while other authors suggest stricter criterium, according to which the number of input and output units should be at least three-fold less than the number of DMUs (Bowlin, 1989).

Realized income from insurance and investment, business expenses and claims paid affect insurance company performance the most. The first input in the model is business expenses, consisting of acquisition and administration costs. Acquisition costs are related to the conclusion of insurance contracts and are created just before and during insurance underwriting. Administration costs include administrative costs divided into amortization, administrative staff salaries and other administration costs. The second input in the model is expenses for insured events, which encompasses all accounting period settled claims, regardless of the accounting period of the occurrence of the damage, reduced by a share of damage reinsurance, increased by the changes in damage reserves at the end of the accounting period, and reduced by the changes in damage reserves at the beginning of the accounting period.

Earned premiums are the primary income that the insurance company business generates. The earned premium is calculated so that the total gross written premium from the accounting period is corrected for adjustments and charged value adjustments, reduced by premiums passed in reinsurance and corrected for transferable premiums. Based on data from insurance company financial reports, information was collected about annual business expenditures and claims determined for inputs and earned premiums as the model output. Most analyzed insurance companies do not show income and expenditure from investment by types of insurance, which is why these variables were not included in the analysis.

This analysis includes active insurance companies which operated in the motor vehicle liability insurance segment in the Republic of Croatia between 2016 and 2021. Between 2016 and 2018, three smaller insurance companies ceased their operations. These companies are excluded from the analysis, so the DEA analysis was conducted on ten active insurance companies.

4. RESEARCH APPLICATION

Tables 1 and 2 show a correlation analysis between the examined variables. Correlation coefficients in motor vehicle liability insurance and non-life insurance have high values, indicating a strong relationship between input and output. The strongest correlation coefficient in motor vehicle liability insurance is between earned premium and cost of insured events, while, in non-life insurance, it is between earned premium and business expenses. All the coefficients are positive, indicating that continuing the DEA analysis is possible.

Descriptive statistics for the selected inputs and outputs are shown in Tables 3 and 4, from where it is evident that the insurance companies are of different sizes. According to the earned premium values, that difference ranges between 45 mil. HRK and 748.5 mil. HRK. The differences are also noticeable in business expenses, between 15.1 and 336.2 mil HRK, while claims paid in the analyzed period range between 23.9 and 395.3 mil HRK.

Notwithstanding these differences, every insurance company represents one DMU which is, by its structure, homogenous. It provides insurance services of motor vehicle liability insurance and operates in the same environment. Substantial differences in the range of minimum and maximum value are also noted in inputs and outputs of the same insurance companies, observed in the values of non-life insurance in the same period.

Table 1. Correlation analysis for motor vehicle liability insurance

	Business expenses	Claims paid	Earned premium
Business expenses	1		
Claims paid	0.925509613	1	
Earned premium	0.969934388	0.979218023	1

Source: Authors' calculation

Table 2. Correlation analysis for non-life insurance

	Business expenses	Claims paid	Earned premium
Business expenses	1		
Claims paid	0.965386276	1	
Earned premium	0.992938594	0.98342086	1

Source: Authors' calculation

Table 3. Descriptive statistics for motor vehicle liability insurance

Description	N	Minimum	Maximum	Mean	Standard Deviation
Business expenses	60	15,178.00	336,235.00	90,637.09	92,139.69
Claims paid	60	23,936.00	395,343.00	116,979.33	99,609.54
Earned premium	60	45,046.00	748,561.00	218,924.33	194,316.02

Source: Authors' calculation

Table 4. Descriptive statistics for non-life insurance

Description	N	Minimum	Maximum	Mean	Standard Deviation
Business expenses	60	49,673.00	875,718.00	258,236.02	217,351.24
Claims paid	60	41,417.00	1,200,100.00	288,025.42	291,559.05
Earned premium	60	83,283.00	2,155,278.00	558,184.53	534,932.93

Source: Authors' calculation

Table 5 shows the annual results of pure technical efficiency obtained by the BCC model, oriented towards inputs, applied to 10 companies operating in the motor vehicle liability insurance segment between 2016 and 2021. Table 6 shows the average annual efficiency parallelly with the number of annual efficient insurance companies in motor vehicle liability insurance and non-life insurance.

Table 5. Insurance company efficiency in motor vehicle liability insurance in the period between 2016 and 2021

BCC	2016	2017	2018	2019	2020	2021	Average efficiency	Average share in the premium
DMU1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	26.70%
DMU2	100.00%	100.00%	100.00%	100.00%	100.00%	90.32%	98.39%	22.41%
DMU3	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	17.96%
DMU4	100.00%	93.50%	100.00%	90.17%	88.92%	91.05%	93.94%	5.86%
DMU5	97.20%	100.00%	99.04%	96.32%	87.41%	100.00%	96.66%	5.27%
DMU6	98.39%	96.76%	91.77%	100.00%	97.17%	100.00%	97.35%	5.61%
DMU7	100.00%	98.39%	100.00%	92.68%	81.75%	85.81%	93.11%	4.67%
DMU8	100.00%	100.00%	100.00%	97.20%	100.00%	93.03%	98.37%	5.13%
DMU9	97.58%	98.97%	98.56%	100.00%	100.00%	99.01%	99.02%	4.07%
DMU10	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	2.32%

Source: Authors' calculation

Table 6. Average annual efficiency and number of efficient insurance companies in motor vehicle liability insurance

Description	2016	2017	2018	2019	2020	2021
Motor vehicle liability insurance	99.32%	98.76%	98.94%	97.64%	95.53%	95.92%
Number of efficient DMUs per year	7	6	7	6	6	5
Non-life insurance	91.96%	91.82%	94.87%	97.43%	95.20%	96.57%
Number of efficient DMUs per year	4	4	5	5	5	5

Source: Authors' calculation

Table 6 shows that the highest average market efficiency is realised in the first observed year, which follows a fall in efficiency. In the last year, the market efficiency had a slight growth compared to the previous year, but it was below the efficiency from 2016. Annual frequencies of occurrence of efficient insurance companies stand at the interval of 5 to 7, where, in 2016 and 2018, the most efficient insurance companies were realized. The efficiency grades of other insurance companies were below 100%, which suggests that, annually, between 3 and 5 insurance companies were inefficient.

The average share of DMUs in total earned premium in the Republic of Croatia indicates that DMU 1, DMU 2 and DMU 3, on average, together realize

67.07% of the entire earned premium. According to the BCC model, DMU 1 and DMU 3 realize total efficiency in all years. In the last year, DMU 2 recorded a fall in efficiency; consequently, the average efficiency was reduced to 98.39%. The other insurers between DMU 4 and DMU 10 have an average share in earned premiums of 32.93%. The average shares of DMU 4, DMU 5, DMU 6 and DMU 8 are above 5%, and DMU 10 has the lowest average share of 2.32%.

DMU 4 and DMU 7 have the lowest average efficiency, resulting from a fall of efficiency in 2017 and a reduced efficiency after 2018. the data from Table 5 thus shows that three insurance companies were efficient in all the periods, namely DMU 1, DMU 3 and DMU 10, and each insurance company realized total efficiency within a minimum of two years. In the last analyzed year, 2021, apart from fully efficient DMUs, only DMU 5 and DMU 6 were thoroughly efficient. In 2016, the highest average annual efficiency was achieved, and the lowest number of inefficient DMUs, and the same DMUs were inefficient in 2018, the second year by the height of average efficiency.

An additional analysis of efficiency movements was prepared for non-life insurance. This facilitated a comparison of movements of average efficiency in motor vehicle liability insurance and non-life insurance. The efficiency analysis for non-life insurance was created according to the same DMUs, which, together, encompass a market share of over 93%, and, based on this, the annual average was calculated, shown in Table 6.

Graph 1. Comparison of movements of average efficiency in motor vehicle liability insurance and non-life insurance in the period between 2016 and 2021
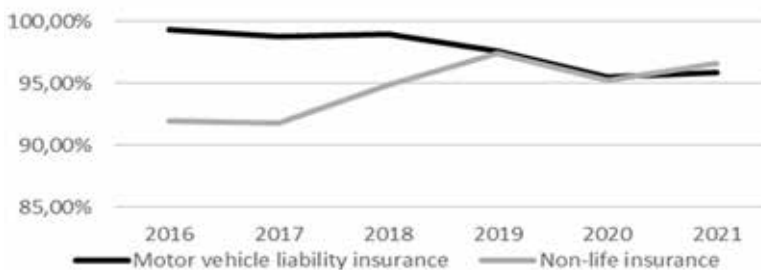
Source: Authors' calculation

The Graph illustrates the movements of the average annual efficiency of motor vehicle liability and non-life insurance. In 2016, the essential difference

was in efficiency; thus, in motor vehicle liability insurance, a near-full efficiency value was reached, whereas, in non-life insurance, the efficiency was 91.96%. After this, a trend of fall in efficiency was noted in motor vehicle liability insurance and an increase in efficiency in non-life insurance in 2018 and 2019. In 2019, the difference in efficiency between the observed insurances was reduced to 0.21%. In 2021, efficiency in non-life insurance was 0.65% higher than the level of efficiency in motor vehicle liability insurance.

5. CONCLUSION

In this paper, the authors analyzed the efficiency of Croatian insurance companies in motor vehicle liability insurance. The inputs used in the research are business expenses and claims paid, while the output is earned premium. In the observed period between 2016 and 2021, consolidation of the Croatian insurance industry was underway, reducing the number of insurance companies in this segment from 13 to 10. The data was gathered from ten active motor vehicle liability insurance companies. Following the researched literature, the analysis was conducted using the DEA method, applying an input-oriented BCC model.

According to the analysis results, efficiency in motor vehicle liability insurance has a falling trend as opposed to the total of non-life insurance, which records a growing efficiency trend. In the observed period, the difference in efficiency from the analyzed segments was reduced, only for the efficiency of non-life insurance to grow in the last year above the efficiency of motor vehicle liability insurance. In motor vehicle liability insurance, two companies with the highest shares in earned premiums realized total efficiency. In contrast, one large insurance company suffered a fall in efficiency in the last analyzed year. Of insurance companies with lower average shares in total earned premiums, only one insurance company was efficient in all the observed years, which proves that the business scope in this type of insurance affects the efficiency level.

The research limitation reflects that, in their financial reports, insurance companies do not show investment costs and income from investment realized from motor vehicle liability insurance. Therefore, the authors could not include these variables in the research.

An efficiency analysis of other types of insurance within non-life insurances in the Republic of Croatia can be conducted in future research. Furthermore, efficiency analyses in motor vehicle liability insurance can be carried out in the European Union countries, and efficiency levels between countries are compared.

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VISA - WELTWEIT FÜHRENDE KREDITKARTENORGANISATION - KURZANALYSE EINES MUSTERBEISPIELS EINER WERTSTARKEN WACHSTUMSAKTIE MIT INFLATIONSSCHUTZ

Urban BACHER, Ph.D.
Pforzheim University, Business School

E-mail: urban.bacher@hs-pforzheim.de

Sophia WEGMANN
Pforzheim University, Business School

E-mail: wegmanns@hs-pforzheim.de

Abstract

Anleger zittern aktuell vor der hohen Inflation. Die weltweit führende Kredit-kartenorganisation Visa hat ein äußerst margen- und wachstumsstarkes Geschäftsmodell, das auch einen gewissen Inflationsschutz in sich birgt. Der vorliegende Beitrag beschreibt das Geschäftsmodell von Visa und deren sehr gute wirtschaftlichen Verhältnisse. Ergebnis: Visa ist ein Musterbeispiel für eine wertstarke Wachstumsaktie und zählt zu den „Dauerläufern" in einem Aktiendepot.

Keywords: *Visa, Visa-System, VisaNet, Mastercard, Kartengeschäft, Kredit-kartengesellschaft, Zahlungsdienst, Zahlungssystem, bargeldloses Bezahlen, Onlinezahlungsdienst, Qualitätsaktie, Wachstumsaktie, Inflation, Inflations-schutz, Inflationsgewinner.*

JEL: *G21, G23*

1. PROBLEMSTELLUNG

Nach mehr als drei Jahren Pandemie haben Wirtschaft und Gesellschaft nun auch noch mit hoher Inflation, einer Energiekrise und dem Ukraine-Krieg zu kämpfen. Unternehmen leiden infolgedessen unter steigenden Zinsen und einer schwächelnden Konjunktur durch die stark steigenden Preise. Die folgende Kurzanalyse soll aufzeigen, warum die Visa-Aktie insbesondere in Zeiten hoher Preise für einen Investor attraktiv ist.

2. VISA INC.

2.1. Ein sehr attraktives Geschäftsmodell

Die Visa Inc. ist in über 200 Ländern und Regionen präsent und der weltweit führende Anbieter im Bereich der bargeldlosen Abwicklung von Zahlungstransaktionen (VISA, 2022c). Die amerikanische Aktiengesellschaft wurde 1970 von Dee Hock in Fresno, Kalifornien unter dem Namen National BankAmericard Inc. gegründet. Seit 2016 ist Alfred F. Kelly als CEO bestellt. Vor seiner Chefposition bei Visa arbeitete Kelly über zwanzig Jahre in mehreren leitenden Positionen bei American Express. Das Europageschäft von Visa wird von Charlotte Hogg verantwortet. Zuvor war Hogg bei der Bank of England als Chief Operating Officer tätig.

Der Kreditkartenmarkt wird weltweit von einem „Duopol" Visa und Mastercard dominiert.[1] Mit großem Abstand nach den Marktführern folgen American Express und Diners Club sowie das japanische Unternehmen JCB (Huch, 2021; Visa Annual Report, 2021: 14).

Das Geschäftsmodell von Visa („Visa-System") besteht darin, mittels dem digitalen Zahlungsdienst VisaNet weltweit einen sicheren, einfachen und schnellen Geldverkehr zu ermöglichen. Im Visa-System geben Banken und FinTech-Unternehmen Kredit-, Debit- und Prepaidkarten aus, deren Zahlungen über VisaNet abgewickelt werden. Hierfür erhält Visa eine Lizenzgebühr je ausgegebener Karte. Visa agiert während einer Zahlungstransaktion als

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[1] Besonderheiten bestehen in Russland (Sanktion infolge des Ukrainekrieges) und in China (staatlicher Lenkungseingriff). In Indien und in den arabischen Ländern versucht man den Einflussbereich von Visa und Mastercard zu beschränken. Vgl. hierzu auch 3.2.

Schnittstelle zwischen der Bank des Käufers und der Bank des Verkäufers und erhebt dabei eine umsatzabhängige Gebühr (Huch, 2021: 7; 22).

Die folgende Abbildung zeigt vereinfacht, wie der Prozess eines Bezahlvorgangs in Sekundenschnelle abläuft.

Abb. 1. Business Modell von Visa
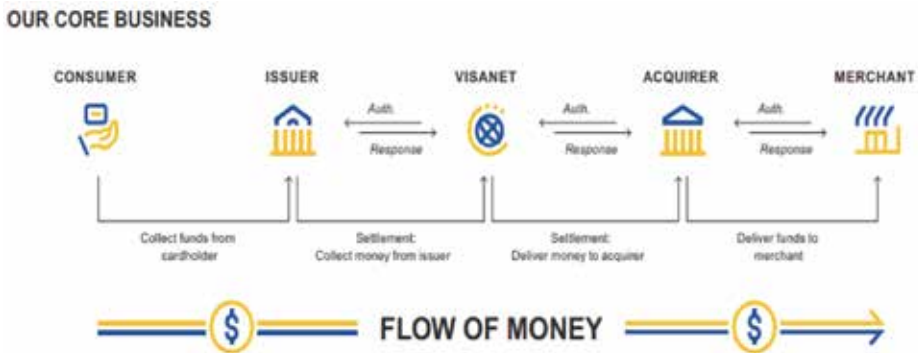
Quelle: Visa Annual Report, 2021

Neben den Kerngeschäften der Abwicklung von Zahlungstransaktionen und Bargeldabhebungen an Geldautomaten arbeitet Visa zusätzlich an modernen Zahlungsmöglichkeiten wie „Click to Pay", „Tap to Phone", „Tokenization" sowie die Bezahlung mit Kryptowährungen (Visa Annual Report 2021: 10).

2.2. WIRTSCHAFTLICHE VERHÄLTNISSE VON VISA UND KENNZAHLEN DER VISA-AKTIE

Visa ging 2008 zu einem Ausgabepreis von 44 US-Dollar an die Börse. Im März 2015 lag der Kurs bereits bei 260 US-Dollar und somit fast um das sechsfache höher. Dies veranlasste die Geschäftsführung zu einem Aktiensplit im Verhältnis 4:1, wodurch der Kurs sich am 19. März 2015 auf 65 US-Dollar verringerte. Aktuell (02.03.2023) liegt der Kurs bei 218 US-Dollar. Dies entspricht einer splitbereinigten Wertsteigerung (ohne Dividenden) von über 1.500 % in 15 Jahren (vgl. Abb. 2 und 3).[2] Die Visa-Aktie konnte den Weltindex in dieser Zeit deutlich schlagen!

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[2] Diese Zahl ergibt sich, in dem man den aktuellen Aktienkurs durch den splitbereinigten Ausgabepreis dividiert

Abb. 2. Langfristchart der Visa-Aktie in US-$
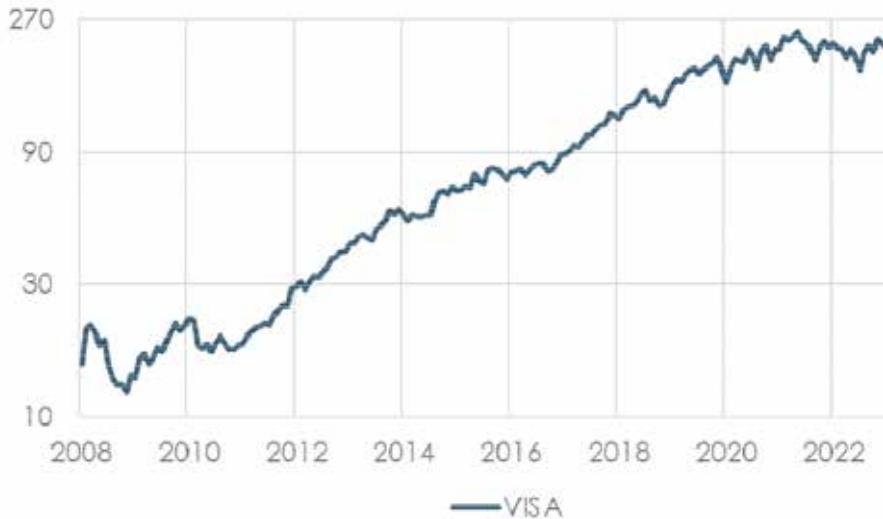
Abb. 3. Wertentwicklung der Visa-Aktie (2008 = 100 %) im Zeitvergleich und im Vergleich mit dem Weltindex (MSCI-Welt)

Grundlage des phänomenalen Kursanstiegs der Visa-Aktie ist die sehr gute Entwicklung der wirtschaftlichen Verhältnisse von Visa, die seit Jahren von guten Wachstumszahlen beim Umsatz, Gewinn und den Barmitteln geprägt ist (vgl. Abb.4). Selbst in den Corona-Jahren 2020 und 2021 konnte sich Visa wirtschaftlich gut behaupten und schnell wieder Tritt fassen.

Seit 2015 konnte Visa seinen Umsatz im Durchschnitt um etwa 10 % p.a. steigern. Auch die Gewinne konnten im selben Zeitraum deutlich gesteigert werden. Die Eigenkapitalausstattung von Visa ist solide. In den letzten fünf Jahren lag die Eigenkapitalquote zwischen 40 % und 50 % (finnanz-net, 2022b).

Abb. 4. Wichtige Kennzahlen von Visa

Wichtige Kennzahlen von Visa	2018	2019	2020	2021	2022
Dividende in $ pro Aktie	0.88	1.05	1.22	1.33	1.58
Ergebnis (netto) pro Aktie	4.13	4.97	4.57	5.26	6.55
Umsatz in Mrd. $	20.6	23.0	21.8	24.1	29.3
Jahresüberschuss in Mrd. $	9.9	11.7	10.5	12	14.6
EK (wirtschaftlich) in Mrd. $	28.5	29.2	31.1	34.5	33.5
Liquide Mittel in Mrd. $	9.7	9.2	17.3	17.5	18
Nettorendite in %	48	51	48	50	50

Visa ist eines der profitabelsten Unternehmen der Welt: Bei einem Umsatz von 29 Mrd. US-Dollar im Jahr 2022 beträgt das EBIT 19.9 Mrd. US-Dollar (vgl. Abb. 5). Dies bedeutet, dass Visa eine hohe EBIT-Marge von 68 % vorweisen kann.[3] Die hohe Marge liegt unter anderem an den geringen Grenzkosten. So stellt Visa die Zahlungsinfrastruktur für Geldtransaktionen bereit, dessen Kosten kaum von ihrer Nutzung abhängen (Schlenk, 2020). Diese hohe Skalierbarkeit macht Visa zu einem hoch profitablen Unternehmen.

Abb. 5. Schätzungen der Analysten zur Visa-Aktie

Analystenschätzungen Visa	2022	2023e	2024e
Umsatz in Mrd. $	29.3	32	36
EBIT in Mrd. $	19.9	22	25
Gewinn pro Aktie	7.5	8.3	9.7
KGV	29	26	22
Cashflow je Aktie	8.8	9	10.8

Selbst in einem inflationären Umfeld wie heute, kann Visa seine Gewinne konstant hochhalten. Dies liegt daran, dass Visa prozentual an den Umsätzen

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[3] Die EBIT-Marge liegt seit Jahren über 60 %.

mit Kartenzahlungen beteiligt wird. Somit profitiert Visa vom inflationsbedingt höherem Zahlungsvolumen. Steigende Energiekosten betreffen Visa nicht direkt, zumal Visa kein energieintensives Geschäft betreibt (VISA, 2020a). Visa ist also weder von der Inflation noch von höheren Energiekosten besonders belastet. Im Gegenteil: Die Inflation treibt die Umsätze und damit die Provisionen und Gewinne von Visa in die Höhe.

Das KGV 2022, welches den aktuellen Kurs ins Verhältnis zum berichteten Gewinn 2022 setzt, lag bei ca. 29; für 2023 ergibt sich ein rechnerisches KGV auf Basis des erwarteten Gewinns von etwa 26.[4] Durch das kontinuierliche Wachstum fällt das KGV tendenziell, es sei denn, dass die Aktie schneller steigt als der Gewinn. Visa generiert jährlich einen enormen Cashflow, der sich auch in den hohen Barbeständen widerspiegelt. Aktionäre profitieren hiervon in Form von Dividenden aber auch von Aktienrückkaufprogrammen. So schüttet Visa etwa 20 % bis 25 % seines Gewinns als Dividende aus. Weitere 8.7 Mrd. US-Dollar gab Visa im Jahr 2021 für Aktienrückkäufe aus (Visa Annual Report, 2021: 61).

3. SWOT-ANALYSE VON VISA

3.1. Stärken des Zahlungsdienstleisters

3.1.1. Geschäftsmodell als Kernstärke

Eine Stärke von Visa ist das bewährte Geschäftsmodell. Das VisaNet ermöglicht nutzenden Verbrauchern und Händlern eine sekundenschnelle Zahlungsabwicklung ohne großen Aufwand. Pro Sekunde können 56,000 Transaktionen über das Zahlungssystem durchgeführt werden (VISA, 2022d). Neuen Wettbewerbern ist der schnelle Markteintritt verwehrt: Zu groß sind die finanziellen Hürden, der technische Aufwand und das Nichtvorhandensein eines weltweiten Netzwerks. Dieser Schutzwall verleiht Visa eine Marktmacht.

Durch die Mobilität und Vernetzung von Menschen und deren Geschäfte nehmen die digitalen Bezahlvorgänge stetig zu (Huch 2021: 1). Auch die Mitarbeiteranzahl steigt kontinuierlich an. Derzeit arbeiten 26,500 Mitarbeiter bei Visa, vor fünf Jahren waren es noch 17,000.

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[4] Der historische Wert für das KGV liegt bei etwa 35. Das KGV 2022 von Mastercard lag bei 30.

Seit Anfang 2022 steigen – inflationsbedingt – weltweit die Preise. Da Visa am Zahlungsvorgang mittels prozentualer Provision verdient, steigen durch die höheren Preise auch die Provisionseinnahmen. Visa partizipiert mittels Automation durch Skaleneffekte, durch eine höhere unbare Zahlungsquote und durch das höhere Preisniveau.

Im Gegensatz zu Konkurrenten wie American Express wickelt Visa nur die Zahlung ab und finanziert dem Kunden keinen Kredit (Schömann-Finck, 2018). Das Kreditrisiko trägt im Visa-System die Karten herausgebende Bank und nicht Visa. Gerade in Zeiten steigender Zinsen und sich anbahnender Rezession, profitiert Visa davon, dass sie nur das Zahlungsnetzwerk bereitstellt, jedoch selbst keine Karten ausgeben.

3.1.2. Markteintrittsbarrieren

Für Neueinsteiger in internationale Zahlungssysteme bestehen hohe Markteintrittsbarrieren. In erster Linie ist technisches Know-How[5] und ein weltweites Netzwerk zu nennen (Schlenk, 2020). Beides verlangt viel Kapital und Ressourcen. Im Visa-System bieten beispielsweise über 80 Mio. Händler in mehr als 200 Ländern das bargeldlose Bezahlen mit dem Visadienst an (Visa Annual Report, 2021: 5). Und ohne weltweite Akzeptanzstellen werden Kunden dieses Zahlungssystem nicht verwenden. Die Durchsetzung eines neuen Zahlungssystems würde also insgesamt sehr aufwendig sein, gerade in Bezug auf weltweite Netzwerkpartner, Kosten und Zeit (Deutsche Bundesbank, 2022; Sander and Bacher, 2021: 112). Zudem lebt das Geldgeschäft von Vertrauen (Bacher, 2022: 7; 14; 149; 159).

3.2. Schwache Marktstellung in ausgewählten Regionen

So stark Visa auch in der westlichen Welt vertreten ist, so hat das Unternehmen seine Schwächen im asiatischen Raum sowie weiterer Schwellenländern (Visa Annual Report, 2021: 20). China beispielsweise hat mit UnionPay, WeChat Pay und Alipay eigene, staatlich gelenkte Zahlungssysteme, mit denen Visa vor Ort nicht konkurrieren kann (Bacher, 2022: 193; Sander & Bacher, 2021: 110). Weiterhin wollen mehrere Staaten rund um Katar und den Ver-

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[5] Know-how i. S. von Wissen über Zahlungsdienste, Bank- und Handelssysteme und i. S. von Automation und Digitalisierungswissen.

einigten Arabischen Emiraten, aber auch Indien verhindern, dass Visa dort Transaktionen abwickelt. Auch die Afrikanische Zentralbank hat angekündigt, nationale Zahlungssysteme zu unterstützen.

3.3. Chancen durch gesellschaftliche Entwicklungen

3.3.1. Bargeldabschaffung

Seit längerem zeichnet sich ein Trend weg vom Bargeld hin zur Kartenzahlung ab. Während der Anteil der Barzahlungen im Einzelhandel im Jahr 2009 noch bei fast 60 % lag, ist dieser bis heute auf fast 39 % gesunken (Deutsche Bundesbank, 2022; Bacher, 2022: 189). Der Anteil der Kartenzahlungen steigt kontinuierlich. Die Pandemie hat diesen Effekt nachhaltig verstärkt. So gaben bei einer Umfrage der Deutschen Bundesbank 69 % der Befragten an, sie würden nun häufiger bargeldlos zahlen, da dies einfacher geworden sei (Deutsche Bundesbank, 2022: 40; Bacher, 2022: 189).

3.3.2. Digitaler Wandel

Im Zuge der Digitalisierung wird zunehmend nicht mehr nur die physische Karte genutzt, sondern auch das mobile Bezahlen mit dem Smartphone oder der Smartwatch verbreitet sich vor allem bei der jüngeren Generation (PricewaterhouseCoopers, 2022). Diese Entwicklung könnte dazu führen, dass Verbraucher künftig ganz ohne Portemonnaie aus dem Haus gehen und alle Einkäufe mit dem Smartphone bezahlen. Zahlungssysteme wie Apple Pay oder Google Pay ermöglichen zwar das Bezahlen mit dem Smartphone, jedoch wird auch hier die Karte des Verbrauchers in einer Wallet hinterlegt und letztendlich die Zahlung über die Kreditkarteninfrastruktur abgewickelt (Visa Annual Report, 2021: 13). Visa begleitet diesen Trend des digitalen Wandels mit und arbeitet stets an weiteren innovativen Zahlungsverfahren, um die Akzeptanz von mobilem Bezahlen zu erhöhen. So hat Visa 2020 die Anwendung „Tap to Phone" entwickelt. Zahlungen können so mittels einer App getätigt werden (VISA; 2020b). Mit der Anwendung „Click to Pay" kann ein Käufer seinen Einkauf im Internet schnell und einfach über Visa abwickeln (VISA 2022a).

3.4. Risiken durch Wettbewerb und Abhängigkeiten

3.4.1. Wachsende Konkurrenz durch innovative Zahlungsdienste

PayPal ist die am häufigsten verwendete Zahlungsart im Internet. Die Hinterlegung der Visakarte ist dabei (nur) eine Option der Zahlungsvarianten (Bundesbank, 2022: 22; Bacher, 2022: 193). Insofern kann hieraus eine Wettbewerbsgefahr erwachsen. Weitere innovative Zahlungsdienste wie Klarna übernehmen auch die Zahlungs- und Finanzierungsfunktion. Eine äußerst interessante Kundenklientel mit hoher Markenaffinität hat Apple. Sollte Apple sich dazu entschließen, ein eigenes Zahlungsnetzwerk aufzubauen, würden Zahlungen nicht mehr über das VisaNet abgewickelt werden. Hierdurch könnte Visa einen stark wachsenden Markt verlieren und Marktanteile an Apple abgeben (Jusifov, 2020). Die Beispiele zeigen, dass FinTech-Dienste je nach konkreter Ausgestaltung des Zahlungsweges zu einer Gefahr für Visa werden können.

3.4.2. Abhängigkeit von den USA

Ein weiteres Risiko für Visa ist die starke Abhängigkeit von den USA. Laut Visa wird 46 % des Umsatzes in den USA generiert. Der größte Konkurrent Mastercard hingegen schafft es, seinen Umsatz deutlich diversifizierter zu erzielen. So entspricht deren Umsatzanteil in den nordamerikanischen Märkten nur 35 % (Mastercard, 2021: 79).

3.4.3. Abhängigkeit von Banken und deren Zahlungssystemen

Die Abhängigkeit von den USA könnte weiter verschärft werden, sollte sich Europa auf ein europäisches Zahlungssystem einigen. Mehrere europäische Großbanken haben sich unter dem Namen „European Payments Initiative EPI" zusammengeschlossen und versuchen ein Zahlungssystem zu entwickeln, welches sie unabhängiger von Visa und Mastercard machen würde (Huch, 2021: 47; Visa Annual Report, 2021: 20). Sollte sich das Projekt realisieren lassen und am Markt durchsetzen, hätte Visa einen weiteren großen Konkurrenten in Europa. Der Umsatzanteil in den USA würde sich weiter erhöhen. Die Diskussion um EPI zeigt ebenso die Abhängigkeit von Banken und deren Zahlungssystemen. In anderen Worten: Visa ist darauf angewiesen, dass Banken oder FinTechs ihre Kreditkarten ausgeben.

4. HANDLUNGSEMPFEHLUNG

Visa ist ein sehr solides aufgestelltes Unternehmen mit einem sehr eingeschwungenen und genialen Geschäftsmodell: Die Markteintrittsschwellen für neue Anbieter sind extrem hoch, es bestehen Skaleneffekte und das Wachstum ist hoch. Kreditrisiken der Kunden tragen die Banken und Emittenten vor Ort. Die neuartigen FinTech-Dienste werden partnerschaftlich im Sinne eines Win-Win ins Visa-System eingebunden und stellen bisher keine ernstzunehmende Konkurrenz dar. Das margenstarke Geschäft gepaart mit hohem Wachstum und hohen Renditen macht die Visa-Aktie zu einem „Dauerläufer" im Depot.

Die derzeit wirtschaftlichen Rahmendaten sind keine guten Voraussetzungen für boomende Aktienmärkte, zumal hohe Inflationsraten mit einer restriktiven Geldpolitik und steigenden Zinsen einhergehen. Die Zentralbanken nehmen derzeit massiv Geld aus dem System, Rezessionsängste entstehen. Wenn das Geld knapp ist, werden die Kurse für Aktien generell fallen und für Anleger wird manches Zinspapier attraktiver als das Aktieninvestment. Dies gilt aber nicht für Unternehmen mit nachhaltig hohen Margen und soliden wirtschaftlichen Verhältnissen. Derartige Unternehmen bleiben auch im schwierigen Umfeld attraktiv. Kursrückschläge sollten zum Umschichten gerade in wertstarke Wachstumsaktien genutzt werden. Zu diesen auserwählten Aktien zählt die Visa-Aktie. Wer sie noch nicht hat, sollte sie beobachten und überlegen, ob sie in das jeweilige Depot passt.

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THE MULTI-LAYERED FRAMEWORK FOR RESOLVING MASS DISPUTES IN BELGIUM: (BETTER) EQUIPPED FOR A L&H 2.0?

Inez BALLET
Equator Advocaten

E-mail: inez.ballet@eqtr.be

Nenad RANČIĆ, Ph.D.
Pravni fakultet Sveučilišta u Zagrebu

E-mail: nrancic@pravo.unizg.hr

Abstract

In the European Union, the adoption of collective redress procedures to fill the current gap in the legal landscape had long been feared, like Pandora's Box, yet also studied with fascination. In some Member States, private litigation's ‚old technology' has been superseded by a highly effective, usually market-driven, ‚new technology' involving public regulators and consumer Ombudsmen. In this paper, the Belgian framework for dispute resolution comprising different collective redress mechanisms in four „layers" is presented, as well as the famous Lernout & Hauspie (L&H) case, arguably the largest homegrown financial scandal in Belgium, causing around € 700 million in damages to tens of thousands of investors mainly from Belgium and the US. In the US, a settlement was reached quite swiftly. However, a 20-year road of agony to the final judgment awaited Belgian investors, mainly because there was no adequate collective redress mechanism. In this paper, using the historical and comparative methodology, the context of the securities fraud by the Belgian company Lernout & Hauspie will be presented and discussed to establish if the Belgian judiciary system would be better equipped today to tackle the same kind of financial dispute. The conclusion is that Belgium's current class action mechanism is still suboptimal, given the law's limited scope, which excludes securities fraud litigation. While each layer of the framework with different collective litigation mechanisms has its strengths,

none seem to have a broad enough scope and the possibility to give redress in the case of securities fraud. Only the practice of the FMSMA (a regulatory body) to enter into settlements with financial institutions seems to have the potential to turn into an alternative for class actions in the financial sector.

Keywords: *class action lawsuit, collective litigation, consumer's protection, Lemout & Hauspie, securities fraud*

JEL Classification: *K22*

1. INTRODUCTION

Globalization and digitalization have increased the risk of mass damage situations that distort the market, so the legal landscape should adapt to allow for effective collective dispute resolution. In the European Union, the adoption of collective redress procedures to fill that current gap in the legal landscape had long been feared like Pandora's box yet also studied with fascination; "Can Europeans become Americans without American flaws? Can Americans export their virtues to Europe, free from specific flavors of their peculiar American character?" (Uzelac & Voeth, 2021: 4) Policymakers in the European Union are more specifically wary of the class action culture of the USA and the social costs and negative economic effects that it supposedly often entails (Cenini et al., 2010). A "class action lawsuit," or in Europe, more commonly referred to as a "collective redress mechanism," is a procedural device used in litigation to consolidate actions for the protection of the rights of large numbers of parties whose cases involve a common question of law and/or fact. In the USA, they are defined by the Supreme Court as 'an exception to the usual rule that litigation is conducted by and on behalf of the individual named parties only' (Wal-Mart v. Dukes, 564 U.S. 338 (2011)). Therefore, the court's decision made in the process is binding not only for the representative and the sued party but also for the whole class of other unnamed persons who do not directly participate in the process (Uzelac & Voeth, 2021: 4), which was, until recently, totally strange to European continental legal system.

There are two leading causes for resulting inefficiencies:

i) the principal-agent problem, which results from information asymmetries on the side of clients and inhibits their control of the quality of the attorney's performance; and

ii) the risk of opportunistic behavior leads to frivolous suits (Van den Bergh, 2008).

On the other hand, the law and economics literature identifies several economic functions of class action lawsuits; Towards the plaintiffs, these are economies of scale in adjudication through the consolidation of claims, access to justice, and increased affordability of legal protection for plaintiffs whose claims involve amounts that would generally be regarded as too small to surmount rational apathy. Towards potential tortfeasor of mass damages, the same literature also rationalized this tool as a legal remedy to create optimal deterrence (Van den Bergh, 2008). "It is not an exaggeration to say that the US class action (as reshaped in 1966) was a "Copernican turn" in civil procedure: while normally the procedure is organized around the claim, in class actions, claims are organized around the procedure. Due to this paradigm shift, class actions interfere with one of the taboos of civil law—representation without authorization (opt-out rule)—and one of the central principles of societal organization: public policy should be done exclusively by the state, and its enforcement cannot be privatized (no "private attorney general")" (Csongor, 2019: 2). "Opt-out mechanisms are very powerful in that they coalesce a class without the need for members to take any active steps to join the claim as a class member, or to "opt-in". Thus, they can be used to bring extremely large claims with groups comprising millions of people. The jurisdictions where these mechanisms are most prevalent are the UK, the Netherlands, and Portugal." (CMS, 2022: 8) Economically speaking, the question is: Who will fund the whole adventure and remunerate the costs of the group representative? Could it even be public money? Or should it be left to some American *lawyer–entrepreneur*, who is non-existent in the EU, as well as *super-compensatory damages* (punitive and treble damages) and American *discovery rules?* The number of class actions filed in Europe in 2021 (110 claims) exceeds 2020 (109 claims), with a growth of over 120% between 2018 (49 claims) and 2021. The UK (54% of all claims) is the most active jurisdiction in Europe, but an increasing number of claims have been filed in the Netherlands (13% of all claims). Spain, Italy, Bulgaria, Croatia, Montenegro, Slovenia, Belgium, and Norway amount to only about 6% of class actions filed.

Between 2017 and 2021, claims regarding financial products & securities (29%) and product liability, consumer, and personal injury claims (22%) represent most class actions filed. Competition and data protection claims represent

12%. (CMS, 2022: 5-7) "Between 2020 and 2021, there was significant growth in product liability/consumer law /personal injury claims, with triple the number of consumer claims filed in 2021 as in 2020. Several factors, including many Diesel-gate claims in various European jurisdictions, drive this growth." (CMS, 2022: 7)

Over time, many scholars have pointed out that there has been a shift in the techniques of redress delivery. The 'old technology' of private litigation has been superseded in some EU Member States by a highly effective, usually market-driven 'new technology' involving public regulators and consumer Ombudsmen (Hodges & Voet, 2018). These techniques have been approved by the UNCTAD (United Nations Conference on Trade and Development) and deserve to be widely adopted. That is why, in this paper, the *entire* Belgian "framework of dispute resolution" is mapped out, as in Voet, 2017, in which class actions operate and categorize the different collective redress mechanisms in four different "layers", hence the term "multi-layered framework of dispute resolution" used in the title, as well as the Lernout & Hauspie case (from now on L&H case). The L&H case is often regarded as a metaphor for the failure of the Belgian legal system in the event of mass damage claims. It is arguably the largest homegrown financial scandal in Belgium, causing around € 700 million in damages to tens of thousands of duped investors, mainly from Belgium and the US, around 2000. In the US, a settlement was reached quite swiftly. However, a 20-year road of agony awaited countless Belgian investors, mainly because there was no adequate collective redress mechanism yet. Belgian investors had to wait until December 10, 2021, for the curtain to fall on this case finally and for the court to deliver the final judgment on their civil damages for their illicit losses. Losses were due to securities fraud by the Belgian company Lernout & Hauspie. Securities fraud is a type of crime that primarily involves misrepresenting information investors use to make economic decisions. In addition to undermining investor confidence, misreporting distorts economic decision-making by all firms, both those committing fraud and those not. False information impairs risk assessment by those who provide capital and labor to fraudulent firms, suppliers, and customers. Thus, it upsets the efficient allocation of financial or human capital by misdirecting them to subpar projects (Velikonja, 2013).

2. THE EVENTS THAT CALLED FOR MASS DISPUTE RESOLUTION MECHANISMS IN BELGIUM

Collective litigation first received real attention in Belgium in the 1970s, when environmental awareness had slowly but surely risen. Groups attempted to organize collective litigation to enforce environmental regulation or protect pieces of nature against industrial development. They set up *ad hoc* non-profit legal persons, associations, or foundations to pursue a collective interest, namely the protection of the (local) environment, and/or to aggregate their claims. However, the Court of Cassation, Belgium's highest regular court, ruled in the pivotal *Eikendael* judgment that these associations had no standing to sue because under Belgian law, the "actio popularis" is outlawed (Court of Cassation November 19, 1982, Pasicrisie 1983, I, 219). This is because the Belgian Code of Civil Procedure requires a personal interest from those who bring suit, and these non-profit organizations were not deemed to pursue their interests but the general interest, which the state can only protect through the actions of public prosecutors or government agencies. Nevertheless, the *Eikendael* judgment already mentioned the possibility of statutory exceptions to the prerequisite of legal interest, which was cautiously expressed through other judgments and legislation. On the UN level, for example, there was the Aarhus Convention of 1998 (UN, 1998).

Around the turn of the millennium, a group of events – frauds and disasters – led to increased calls for a class action. To begin with, the bursting of the dot-com bubble in the wake of Enron (2000–2001), when massive securities frauds came to light in many European countries, and Belgium experienced its home-grown scandals. L&H was once the dream Jo Lernout and Pol Hauspie decided to pursue together: a company that would develop language and speech technology. The two were firmly convinced that everyday objects – from the coffee maker to the vacuum cleaner – would one day be controlled by voice. Moreover, they wanted to conquer that market. Correctly estimating that it would always be challenging to convince investors and find customers in Flanders, the plan was born to be the first Belgians to step onto a stock exchange that still sounded very exotic: Nasdaq in the USA. Eventually, they were a huge success. Everyone wanted to shake hands, from the king of Belgium to foreign prime ministers and politicians, and even Bill Gates reached for his wallet to participate in their

stocks. However, the dream degenerated into a tale of pride, lies, and fraud after two watchful Wall Street journalists uncovered, in the summer of 2000, that most of the revenue came from some shady and fictitious companies in Singapore and South Korea. The stock price plummeted, and a year after, they were declared bankrupt (SEC, 2002). Countless investors had lost their money due to the massive securities fraud and would demand compensation. In the US, a settlement was reached quite swiftly (SEC, 2002). However, for countless Belgian investors, a 20-year road of agony was awaiting.

The L&H trauma was barely processed when the 2007–2008 financial crises made investors feel they had been defrauded or had at least suffered unjustifiable losses when their bank stocks (Dexia, Fortis, KBC, etc.) collapsed in value. Between the 2001 and 2008 financial market events, a major train accident and the gas pipeline explosion led to calls for a swifter resolution of the victims' damage claims and more equal treatment by courts throughout the country than had hitherto been offered by the Belgian legal system. Aside from the calls from below following these frauds and disasters, the Belgian legislator would also be encouraged from above by the EU's initiatives promoting alternative dispute resolution and novel consumer protection techniques. This would culminate in the 2009 Directive on injunctive relief, the 2013 Directive on out-of-court settlement of consumer disputes, and the 2020 Directive on representative actions (De Wulf, 2021).

3. CURRENT MECHANISMS FOR RESOLVING MASS DISPUTES IN BELGIUM

Current mechanisms for resolving mass disputes in Belgium can be classified into four main categories:

- private enforcement mechanisms,
- compensation made by a criminal court,
- regulatory redress and
- ADR or ombudspersons.

Throughout the rest of the paper, the same subchapters will recur in every chapter, answering the same questions and giving it a similar structure, allowing for easier comparison.

3.1. Private enforcement mechanisms

3.1.1. General description

Statutory exceptions to the legal interest prerequisite; As previously mentioned, environmentalist groups provided those first small but pivotal pushes towards collective litigation in Belgium, eventually leading to the Eikendael judgment. The judgment mentioned the possibility of statutory exceptions to the prerequisite of legal interest, which was cautiously expressed through other judgments and legislation. This exceptional framework is, however, limited in nature: only associations or organizations satisfying specific legal criteria have standing, they can only institute injunctive or preventive actions – which is the most significant shortcoming – and they only exist in a limited number of fields, such as the protection of the environment and human rights and the prevention of racism, discrimination, genocide, partner violence, and negationism (Voet, 2015).

Connected claims, third-party intervention, and party representation through explicit mandates; Other legal tools for multi-party actions exist, though they have their shortcomings; Firstly, connected claims can be filed together (Article 701 Judicial Code). Secondly, third parties can intervene in pending proceedings and formally become a party to the proceeding (Articles 15 and 16 Judicial Code). Thirdly, the technique of party representation allows the representation of a group of individuals by a person who has received an explicit mandate from all those individuals to do so (Voet, 2015). Since these are deficient in adequately offering collective redress, we will not elaborate on them further.

The Belgian (consumer) class action; After countless calls from below and above (as described in Chapter A), years of debate, and several failed attempts by various political parties, Belgium enacted its first general Class Action Act on March 24, 2014.[1] The design would allow one class representative to bring an aggregate of individual consumer claims aiming at obtaining redress before a court in a single procedure without a prior mandate.

There are three admissibility conditions:

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[1] Law inserting title 2 "Legal action for collective reparation" in Book XVII "Special legal procedures" of the Code of Economic Law and inserting the definitions specific to Book XVII in Book I of the Code of Economic Law, Official Gazette 29 March 2014.

1) the claim's cause concerns a potential breach by a trader of one of its contractual obligations – so, no extra-contractual claims – or a potential infringement of one of the listed European and Belgian regulations and acts;

2) the claim must be brought by an appropriate group representative who meets the stipulated requirements;

3) the recourse to this collective redress mechanism seems more effective than a general legal action.

The procedure consists of four phases:

1) a certification phase;

2) a mandatory negotiation phase;

3) a potential phase on the merits;

4) an enforcement phase.

Almost eight years later, only a few cases have been brought, like in most European countries that have introduced class actions over the past ten years. In December 2021, Belgium's most significant consumer association (Test-aankoop/Test-achats) officially announced the tenth class action case they are taking on against Apple's practices of planned obsolescence (Testaankoop, 2020). Thus far, four cases have been concluded, with only one collective settlement (Groupon). The Belgian class action act seems to function reasonably well within its intrinsic limits. However, the deficiencies that most scholars usually bring to the fore are the limited scope of application, the market monopoly of Belgium's biggest consumer associationTest-aankoop/Test-achats, the complete lack of appropriate and suitable funding and financing mechanisms, and several procedural design flaws.

3.1.2. The scope

As mentioned above, the collective actions brought by the associations or organizations that satisfy specific legal criteria are only available in a limited number of fields as statutory exceptions, such as the protection of the environment, the protection of human rights, the prevention of racism, discrimination, genocide, partner violence, and negationism. Connected claims, third-party interventions, and party representation techniques are generic. The scope of the class action technique is essentially limited to consumer law. As stated before, the first admissibility prerequisite requires that the claim's cause concerns a potential breach by

a trader of one of its contractual obligations or a potential infringement of one of the listed European and Belgian regulations and acts (Articles XVII.36, 1° and XVII.37 of the Code of Economic Law). Also, all listed provisions are situated in the field of consumer protection law. While this limited scope has already been – and is still being – criticized the Constitutional Court held that the act's limited scope of application did not render it unconstitutional (GwH March 17, 2016, nr. 41/2016, 27-31). The Court stated that most mass cases are consumer cases and that the European and Belgian consumer regulations and acts list were sufficiently comprehensive. Moreover, the Court found that because it concerns a novel and complicated procedure, the Belgian legislature was right to limit, in the first instance, its scope to consumer protection cases. Amendments to expand the scope, such as shareholder disputes, were rejected.

An Act of March 30, 2018, expanded the scope of the original class action act by allowing small and medium-sized firms to be class members as well. In contrast, under the original 2014 Act, only consumers could be class members, and firms, as a rule, cannot be regarded as consumers for purposes of Belgian law. SMEs, in the sense of the Commissions' Recommendation of May 6, 2003, concerning the definition of micro, small, and medium-sized enterprises, concern enterprises that employ fewer than 250 persons and which have an annual turnover not exceeding EUR 50 million and/or an annual balance sheet total not exceeding EUR 43 million. The 2018 Act was enacted to react to the so-called „Fipronil crisis". In July 2017, it came to light that some chickens' eggs could have been contaminated with Fipronil, a pesticide-like product used to combat disease in poultry. As a result, vast amounts of eggs and products made based on eggs had to be destroyed. SMEs, including many local „artisan" bakers, complained that, as a result, they had suffered significant economic losses. Part of the political reaction was allowing these important constituencies to claim damages from the large „agroindustry" firms deemed responsible for the potential Fibronil pollution (Kleis, 2017; EC, 2018; NL Times, 2017).

3.1.3. Remedies: compensatory and injunctive

Only injunctive relief or preventive actions can be achieved through the collective actions of associations by way of statutory exception, and no damages can be claimed. Same with prohibitory injunctions: these can only lead to injunctive relief and the finding of a violation. Belgian class actions, on the other hand, *do* aim at providing compensation.

3.1.4. A Road for Victims of securities fraud to obtain compensation

Since only class actions can lead to compensation, only those private instruments would have the potential to give an affirmative answer to this question. However, while it seems as if no explicit provisions in the Act stating that securities fraud or cases based on securities laws are excluded, the exclusion – according to Professor Hans De Wulf – follows from several provisions in the Act.[2] This exclusion is somewhat puzzling since the call for class action in Belgium grew louder after the fraud cases that came to light as the 2001 dot-com bubble burst and the cases involving thousands of investors that felt defrauded (rightly or wrongly) as a result of the collapse of two of Belgium's biggest banks, Fortis and Dexia, in the 2007–2008 financial crisis. In other words, were there to happen an L&H 2.0, duped investors would not be able to count on private enforcement mechanisms if they would want to aggregate their claims. It remains to be seen what the Belgian legislator will do now that they are being instructed to thoroughly revise the Act in response to the 2020 Directive on representative actions (Directive 2020/1828).

3.2. Compensation made by a criminal court

3.2.1. General description

Victims can formulate their civil claim either before (Article 63 Code of Criminal Procedure) or during (Article 67 Code of Criminal Procedure) criminal proceedings via the so-called *„partie civile"* technique. By doing so, the victim initiates criminal proceedings (Verstraeten et al., 2012). As a result, they become formal parties to the criminal proceedings. If all three conditions for civil liability (Article 1382 Civil Code) (damages, causation, and a fault, *i.e.*, violation of the law) are met, the criminal judge will grant damages to the civil claimants. This is where Voet sees the most significant advantage to this technique; Since a violation of the law constitutes a „fault" in the civil sense, and the Public Prosecutor will already provide the evidence demonstrating a violation of the law, the civil party only needs to prove damages and causation to prove civil liability. Voet interprets this possibility for the civil party to rely on evidence

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[2] For a more in-depth analysis of securities fraud and class actions, read: de Wulf, H. (2021) "Class Actions in Belgium", in Fitzpatrick & Thomas (Eds.), (2021) The Cambridge Handbook of Class Actions: An International Survey, Cambridge, Cambridge University Press, doi:10.1017/9781108770927.

assembled by public prosecutors in criminal cases as a beneficial form of „piggy-backing" (Uzelac & Voet, 2021). However, the disadvantages are those criminal proceedings must be brought and successful against defendants with adequate financial resources, and only after the criminal investigation and trial have ended can one claim any damages (*le criminel tient le civil en état*). This means years of delay and the possibility that the failure of the public prosecutor to have the defendants convicted on criminal charges would negatively influence the same court's readiness to award civil damages. The L&H case is an excellent example of this. In the L&H fraud, a quick settlement was reached in the US, while to the irritation of many, the Belgian court case could not even start because it had to wait for the result of an everlasting, over-careful criminal investigation. After 20 years, the court finally delivered a judgment on the civil damages on December 10, 2021. However, the six convicted former directors have little left to gain, making the judgment merely a Pyrus victory.

In a 2016 report for the Oxford-Leuven Collective Redress Project, professor Stefaan Voet briefly mentions two additional mechanisms in this category: the amicable settlement with the Public Prosecutor and mediation in criminal cases (Voet, 2016). A defendant has no right to an amicable settlement with the Public Prosecutor. It is a favorite of the Prosecutor, which he will only grant if certain conditions are met – mainly relating to the nature of the criminal offense. The defendant will not be (further) prosecuted in exchange for a lump sum (Article 216*bis* Code of Criminal Procedure). Most interesting is the condition of an agreement between the defendant and the victim on the scope of the loss and the redress settlement (Article 216*bis*, §2, paragraph 6 Code of Criminal Procedure).

Furthermore, redress must have been offered for the loss suffered (or at the least the non-disputed part), and the defendant must have recognized (in writing) his civil liability (Article 216*bis*, §4 Code of Criminal Procedure). Voet recognizes that this might prove a useful tool in dealing with mass disputes since it shifts the redress settlement to out-of-court negotiations while at the same time ensuring redress. A final mechanism is mediation in criminal cases (Article 216*ter* Code of Criminal Procedure) to prevent criminal proceedings. The Public Prosecutor can request the defendant to receive special training or to follow treatment, but the Public Prosecutor must always also request redress (Verhelst, 2013) (Verstraeten et al., 2012: 328). The following sub-chapters will only focus on the *partie-civile* technique.

3.2.2. Scope

The *partie civile* technique is not linked to a particular sector but is part of the law of criminal procedure. The technique can thus be used to obtain compensation for harm suffered, regardless of the nature of the criminal case.

3.2.3. Remedies: compensatory and declaratory

The aim of a civil party using the *partie civile* technique is to obtain compensation for the harm suffered due to the criminal offense. If, however, the civil claim is rejected, the finding of a violation of the law will provide a certain declaratory effect for cases pending before civil courts. After all, as previously briefly mentioned, civil judges have to suspend civil cases against the same defendant as the concurrent criminal case until the criminal judge has ruled on the criminal case (Article 4, paragraph 1. Preliminary Title Code of Criminal Procedure), which is expressed as follows: „*le criminel tient le civil en état*".

3.2.4. A road for victims of securities fraud to obtain compensation

This was the road on which 15.000 Belgian investors embarked 20 years ago. One must not fall into the fallacy of hasty generalization and possibly throw out the baby with the bathwater. Nevertheless, we follow professor Hans De Wulf's skeptical view that those potential disadvantages – externalized in practice through the L&H case – make this mechanism unsuitable for effectively tackling mass harm situations (De Wulf, 2021).

3.3. ADR and ombudsmen

3.3.1. General description

As an additional remark to Chapter 1, it should be mentioned that ADR is embedded in the Belgian class action procedure. The procedure is construed around reaching a collective settlement, as it is possible in each phase: prior to the proceedings (in which case the parties can ask the court to approve the settlement), during the mandatory negotiation phase after the class action has been certified or during the procedure on the merits of the case (Article XVII.42, §2 Code of Economic Law; Article XVII.45-48 Code of Economic Law; Article XVII. 56 Code of Economic Law).

The Belgian landscape contains multiple ombudsmen. So far, the Federal Public Service for Economy has listed fourteen ADR entities as qualified. Regarding sub-chapter 3.3.4. it is worth mentioning that consumers complaining about a financial service, for instance, will address the Ombudsman in financial matters or the Insurance Ombudsman (Voeth, 2013). Out of all listed Ombudsmen, only the Consumer Mediation Service can be appointed class representative in a class action procedure. Following a request by the mediation services for energy, the Consumer Mediation Service introduced a collective claim in 2018 against important energy suppliers who have continued to charge consumers after the termination of their contract. Of all ten class actions in Belgium, this was the first not introduced by Test-aankoop/Test-achats. The case is currently still in the admissibility stage. Apart from Ombudsmen, several important arbitration, mediation, and reconciliation initiatives fall outside this essay's scope. For a more extensive overview of them, see Voet's 2016 report for the Oxford-Leuven Collective Redress Project.

3.3.2. Scope

Most Belgian ADR agencies have a sectoral – (e.g., the Ombudsman for insurance, for the postal sector, financial conflicts, and the like) or trans-sectoral (such as Belmed) scope.

3.3.3. Remedies

Arbitral decisions can entail injunctive, declaratory and/or compensatory remedies. The same applies to all other ADR mechanisms: it is up to the parties to settle, and only non-binding recommendations can be given. For a more extensive overview of them, see Voet, 2016.

3.3.4. A road for victims of securities fraud to obtain compensation

While ADR is embedded in the Belgian class action procedure, we already established that the class action mechanism is not open for defrauded investors. The recent development of group, class, and collective arbitration should be mentioned for completeness. However, we could not find any noteworthy examples in Europe, let alone Belgium, regarding financial disputes.

3.4. Regulatory redress

3.4.1. General description

Hodges and Voet describe regulatory redress as ordered by or brought about by the intervention of public enforcers (Hodges & Voet, 2018). There are multiple public enforcers or regulators in the Belgian legal landscape, but their powers regarding redress or civil sanctions are generally limited (Voet, 2013). The focus is on deterrence rather than restitution. Nevertheless, victims can claim compensation following a decision on public enforcement (*follow-up*), arguing that the tort (or at least the fault element) has been proven by the findings of a violation (Schoors, Baeyens & Devroe, 2011), (Voet, 2016). The FMSA (Financial Services and Markets Authority) in the financial sector deserves special attention. According to De Wulf, the practice of the FSMA (Financial Services and Markets Authority) to enter into settlement agreements with financial institutions that include an obligation for the financial institution to compensate clients has the potential to turn into an alternative for class actions in the financial sector (De Wulf, 2021).

3.4.2. Scope

The mechanism is restricted to the scope of the public regulator, e.g., telecommunication, medicine, electricity, or financial services.

3.4.3. Remedies

The remedies differ from one public regulator to another. In general, they have been granted wide-ranging investigative powers and sometimes even the power to negotiate settlements of infringements. However, once third parties (*i.e.*, consumers) are concerned and file complaints, the case is usually referred to the ombudsmen or the Public Prosecutor (Voet, 2013).

3.4.4. A road for victims of securities fraud to obtain compensation

According to De Wulf, the practice of „collective settlements" developed by the Belgian financial supervisor (FSMA) offers a glimmer of hope for groups of people that feel they are victims of malpractice in the financial sector. In-

stead of using more traditional sanctions (like fines, bans from certain activities, and the like), the legislature has allowed the FSMA to enter into settlements with financial institutions that fall under its supervision. Initially, the FSMA mainly used this settlement option to strike deals with individuals in cases of alleged insider dealing or market manipulation, and without claiming damages, let alone distributing monetary awards among defrauded investors. In recent years, however, the FSMA has begun to use its settlement powers to force banks to pay damages or at least compensate investors (De Wulf, 2021). Hence, the road of regulatory redress might be the most promising of all those researched in this essay.

4. CONCLUSION

To tackle mass harm situations effectively and efficiently, scholars agree that a multi-layered dispute resolution framework with broad and integrated instrumentation is necessary. All previously discussed enforcement mechanisms, private and public, will need to coexist since collective actions alone are not a perfect instrument to achieve optimal deterrence and avoid enforcement gaps. In the European Union, a unified mechanism for collective or group actions still does not exist, partly because of ever-present continental European skepticism of the Anglo-Saxon legal system, which is unlikely to change, mainly due to different views about legal procedure, compensations, litigation funding, and attorneys' roles and fees. The L&H court case, a twenty-year-long road that led to nothing but a symbolic piece of paper, exposed the incredibly blatant enforcement gaps in the Belgian dispute resolution framework. A quick settlement was reached in the US. At the same time, the Belgian court case could not even start because it had to wait for the result of an everlasting, over-careful criminal investigation. This case is the epitome of the disadvantages of the *partie civile* technique. After countless calls from below (by environmentalists and aggravated victims of frauds and disasters, the L&H fraud included) and above (the EU initiatives), Belgium introduced class actions in 2014. However, their application had been restricted to cases based on consumer protection legislation, while at the same time, only specific accredited „representative organizations" were trusted as lead plaintiffs. Due to the restrictive approach, securities fraud or cases based on securities law had been excluded. This a somewhat puzzling exclusion, given the fact that the previously mentioned „calls from below" were

the result of the frauds that came to light as the 2001 dot-com bubble burst, as well as the cases involving investors that felt defrauded after the collapse of two of Belgium's biggest banks, Fortis and Dexia, in the 2007–2008 financial crisis. However, within the „layer" of regulatory redress, there is a glimmer of hope for groups that feel they are victims of malpractice in the financial sector. Scholars argue that the FSMA (Financial Services and Markets Authority) practice of entering into settlement agreements with financial institutions that include an obligation for the financial institution to compensate clients has the potential to turn into an alternative for class actions in the financial sector. It also follows the current trend in some Member States whereby market-driven 'new technology' involving public regulators is starting to supersede the 'old technology' of private litigation in certain areas of law. While the enforcement gap in the multi-layered framework could, thus, potentially be closed by the 'new technology' regulatory redress, Belgium should drop the restrictive approach towards class actions, especially the fact that only a limited number of organizations co-opted by the government can introduce class actions, based on the violation of a limited number of consumer protection laws.

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Nenad Rančić • Inez Ballet: THE MULTI-LAYERED FRAMEWORK FOR RESOLVING MASS DISPUTES IN BELGIUM: (BETTER) EQUIPPED FOR A L&H 2.0?

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BLOCKCHAIN TECHNOLOGY AND FINTECH IN FINANCE LITERATURE IN CROATIA: A PRISMA-COMPLIANT LITERATURE REVIEW

Katerina FOTOVA ČIKOVIĆ, Ph.D.
University North, Croatia

E-mail: kcikovic@unin.hr

Damira KEČEK, Ph.D.
University North, Croatia

E-mail: dkecek@unin.hr

Joško LOZIĆ, Ph.D.
University North, Croatia

E-mail: jlozic@unin.hr

Abstract

Current finance literature in Croatia mainly focuses on the banking and insurance sector. Considering its economic relevance and topicality, published research on blockchain technology and Fintech is surprisingly scarce. This study surveys, reviews, and analyses Croatia's empirical and theoretical finance literature on blockchain technology and fintech. The purpose of the paper is to fill in the literature gap, investigate state of the art and organize the status of research already conducted on financial technology and blockchain in Croatia to provide easy access to future researchers. Systematic literature reviews have become crucial for informing the academic community about the scientific area's state of the art. Therefore, a systematic literature review with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines has been applied, combining electronic and manual searches to identify relevant studies using keywords such as „BLOCKCHAIN" and/or „FINTECH" and

"CROATIA". The surveyed scientific databases are the online Scopus, Web of Science, and CROSBI (Croatian Scientific Bibliography), with no restrictions to language, date of publication, or study design. The findings of the surveyed papers are presented in a narrative synthesis. Lastly, specific literature gaps, several research questions, and practice implications are identified, and suggestions and guidelines for future work are provided.

1. INTRODUCTION

Emerging and novel technologies and innovations that are rapidly developing and applied in the financial industry are recognized as FinTech, and their main characteristic is their "digital proximity, where the relationship between customers and banks changes from physical proximity to digital proximity" (Martinčević et al., 2022).

Pejić Bach (2019) defines FinTech as a term used in the description of „the impact of new technologies on the financial services industry," "which includes a wide range of „products, applications, processes, and business models" that have dramatically changed the traditional banking and financial operations.

Emerging Financial Technologies (FinTech) and financial innovations are consistently improving the efficiency and facilitating the accessibility of financial services and systems throughout the globe (Pejić-Bach, 2019).

FinTech is defined as "technologically enabled financial innovation that could result in new business models, applications, processes or products with an associated material effect on financial markets and institutions and the provision of financial services" (EBA, 2023). Moreover, FinTech could be observed as "a combination of digital technology and financial services" (Martinčević et al., 2022). Companies and organizations that offer fintech services have positioned themselves as a "fierce competition to banks, with the intention of even completely bypassing the existing financial sector, and primarily the banks", a trend that is very characteristic for the Croatian financial sector as well (Bračun & Turkalj, 2020).

The overarching goal of this article is to survey, identify, present, and analyze the published articles regarding the application of Blockchain technology and

FinTech in finance literature in Croatia. Another goal is to present the findings and results of these studies, determine state of the art in Croatia, and potentially detect and predict any future FinTech applications in Croatia and globally. For this reason, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement guidelines for systematic literature review have been applied to this research. The authors have combined both electronic and manual searches to find relevant published studies using keywords such as „BLOCKCHAIN" and/or „FINTECH" and "CROATIA". The surveyed scientific databases are the online Scopus, Web of Science, and CROSBI (Croatian Scientific Bibliography), with no restrictions to language, date of publication, or study design. The applied PRISMA guidelines have detected 14 papers, a number that gradually decreased after each PRISMA step, which ultimately led to 15 papers on the application of Blockchain technology and FinTech in finance literature in Croatia.

The focal reason for conducting this study was to increase awareness among scholars, individual researchers, analysts, and practitioners regarding the importance of further FinTech development and its even greater application in Croatia.

The rest of this article is structured as follows. Section 2 gives a theoretical background and overview of blockchain technology and FinTech. Section 3 presents the research design and used methodology, whereas the research results are presented in Section 4. A discussion regarding the research results (i.e., the application of Blockchain technology and FinTech in finance literature in Croatia is opened in Section 5, and it also provides conclusions, limitations, and future guidelines.

2. THEORETICAL BACKGROUND ON BLOCKCHAIN TECHNOLOGY AND FINTECH

Even though Financial Technologies (FinTech) have just recently been positioned as a research area with great potential to increase operational effectiveness and efficiency, it has already gained much attention from scholars and academic members throughout the globe and is established as a "rapidly growing sector" (Sahabuddin et al., 2023; Pejić Bach, 2019).

In the digital era, financial innovation (otherwise popularly known as Fin-Tech) is considered the vital concept of ideas and system transformation with the new waves of technological advancement (Sahabuddin et al., 2019).

Even though it was initially developed as "a system of digital payment in 2008" (Juričić et al., 2020), blockchain technology has been increasingly recognized as an improvement to many traditional solutions and as a hotspot research area among scholars around the globe. Blockchain is defined as a technology that lies on the idea of enabling a digital transaction but without the intermediary (such as the banks or other financial intermediaries in the case of classical financial transactions) (Vinšalek Stipić & Vičić, 2022). Blockchain is considered a "decentralized system where a community maintains the whole network and where users are responsible for the system's sustainability", where each user equally participates in the decision-making process, which made blockchain technology "almost revolutionary in some fields, especially in the world of banking and finance" (Juričić et al., 2020). Interestingly, in the initial phase of blockchain technology application (also referred to as "the trusted technology"), a significant number of transactions referred to an alternative form of business characterized by anonymity and the absence of regulatory rules for the subject of trading (Cunjak Mataković & Mataković, 2018). Blockchain technology (BCT) is currently one of the most propitious emerging and developing technologies with the potential to impact many financial sectors globally. Even though it has been introduced as the technology responsible for Bitcoin, Ether, and other cryptocurrencies, it has outgrown these digital currencies. It is successfully applied "in a broad range of business and financial operations". Moreover, its most vital characteristics are "transparency, immutability, interoperability, scalability, accuracy, performance, security, trustworthiness, disintermediation, traceability, persistency, distributed consensus approach, autonomous, decentralized, and secured capabilities" (Tušek et al., 2020).

The crucial role of FinTech in the further transformation of the financial services industry and the whole finance sector is undeniable. Moreover, Sahabuddin et al. (2019) even go one step further and claim that innovation and all the novel and creative applications of digital technology in the finance sector represent a stepping stone for successfully realizing the Sustainable Development Agenda in 2030.

3. RESEARCH DESIGN

The systematic literature review has followed the PRISMA guidelines, as shown in Figure 1. Namely, the PRISMA guidelines consist of four stages as follows: the identification, the screening, the eligibility, and the inclusion stage. In each of these stages, several steps are applied per the inclusion and exclusion criteria. In the first stage (identification), a total of 111 papers were identified with the keywords „BLOCKCHAIN" and/or „FINTECH" and "CROATIA" (13 in the Scopus, 91 in the Web of Science and 7 in CROSBI database). In the first stage, 54 papers were excluded due to repetition, unavailability of full-text download, and eligibility for this review.

In the second stage, 57 papers entered the screening process, and 31 papers were excluded with the help of the inclusion criteria as follows: papers are written in English or Croatian language and Journal articles or reviews as a document type. Twenty-six papers entered the eligibility stage, where the manual screening of each paper took place, and 12 full-text articles were excluded from the further analysis. Thus, 14 papers entered the last stage of inclusion, incorporating quantitative and qualitative analysis of the surveyed papers.

Figure 1. The PRISMA-compliant systematic review of studies on blockchain technology and FinTech in finance literature in Croatia.
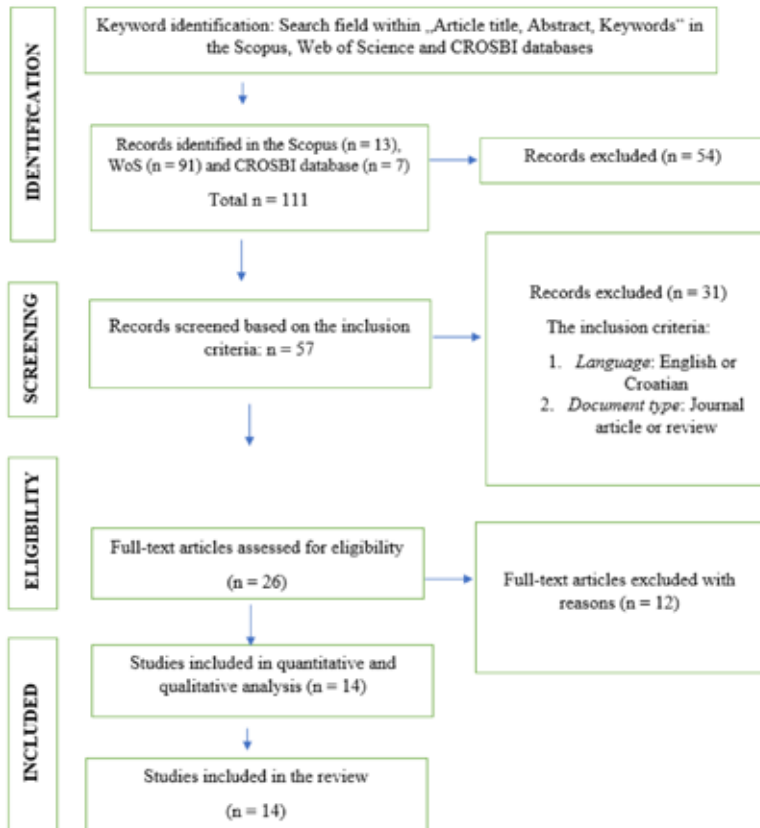
Section 4 presents a detailed qualitative presentation of the surveyed papers and a discussion of their findings in the following Sections.

4. RESULTS

As Fintech is still in its infancy stage, it is somewhat surprising that 14 papers regarding the application of Blockchain technology and Fintech in the Finance sector in Croatia have been surveyed and elected for further qualitative analysis.

Table 1. Surveyed papers regarding blockchain technology and fintech in finance literature in Croatia.

Authors and year of publication	Title of the paper
Cunjak Mataković & Mataković, 2018	Cryptocurrency – sophisticated manipulation codes
Juričić, Radošević & Fuzul, 2019	Enhancing the Usefulness of Blockchain Technology in the Finance Sector
Juričić, Radošević & Fuzul, 2020	Optimizing the Resource Consumption of Blockchain Technology in Business Systems
Merkaš, Perkov & Bonin, 2020	The Significance of Blockchain Technology in Digital Transformation of Logistics and Transportation
Martinčević, Črnjević & Klopotan, 2020	Fintech Revolution in the Financial Industry
Pečarić, Peronja & Mostarac, 2020	Application of "blockchain" and "smart contract" technology in international payments – the case of reimbursement banks
Čulinović-Herc, Zubović & Derenčinović Ruk, 2021	The Influence of Modern Technologies on Intermediate Shareholding - National Models and A Global Perspective
Tušek, Ježovita & Halar, 2021	Critical Auditors' Expertise for Blockchain-Based Business Environment
Pakhnenko et al., 2021	Digitalization of financial services in European countries: Evaluation and comparative analysis
Martinčević et al., 2022	Accounting and Tax Regulation of Cryptocurrencies
Apostu et al., 2022	FinTechs and financial inclusion—Balkan experience: Digital perspectives on financial markets
Sajter, 2022	Overseas Transaction Fees: Sending Money via Bitcoin vs. Banks
Vinšalek Stipić & Vičić, 2022	Blockchain Technology Influence on Accounting Information Systems
Martinčević, Črnjević & Klopotan, 2022	Novelties and Benefits of Fintech in the Financial Industry

Source: Authors' work.

Cunjak Mataković and Mataković (2018) focus on the potential manipulative activities in the information technology segment, i.e., the areas of application of cryptocurrencies, and the investment activities associated with them, emphasizing Bitcoin. Their main aim was to identify and present the warning signs (so-called red flags) about the existence of an economic bubble and a Ponzi scheme and potential financial risks. In the second part of their study, they tackle frauds in which Bitcoin was used and offer a detailed review of frauds designed like Ponzi schemes. Thin main findings reveal that complex information technology such as blockchain and Bitcoin are subjects of Ponzi schemes, giving practical implications for the broad audience in Croatia and globally.

Juričić, Radošević, and Fuzul (2019) focus on exploring the current condition of blockchain technology development and its potential use and improvement in solving different challenges in finance. Their study contributes to scholars and practitioners since it offers new insights into the "non-standard usage" of blockchain and covers the potential use of blockchain technology and its computing technology in many different areas, such as medicine, biology, and finance.

Juričić, Radošević, and Fuzul (2020) tackle the issue of optimization of resource consumption of blockchain in business systems. Moreover, they explore the current state of blockchain technology development, the potential alternatives for future growth and development, and their application in solving various business systems problems. The main objective of their study is to offer new insights into blockchain and to provide new solutions to the current consensus algorithm. They identify the benefits of the Bitcoin network and its biggest drawback, i.e., the Hashcash algorithm commonly used in the *proof of work* consensus.

Merkaš, Perkov, and Bonin (2020) investigate the digital transformation processes in logistics and transport activities. They cover the fundamental concepts of blockchain technology and its combined use with the Internet of Things. Moreover, they provide "a comprehensive overview of current blockchain initiatives and use cases." The main goal of their study was "to identify blockchain's role in achieving logistic objectives, intending to point out the significance of blockchain technology in the digital transformation of logistics and transportation." Their results reveal that applying blockchain technology combined with IoT results in better "business process optimization, supply chain traceability and transparency, and significant financial savings."

Martinčević, Črnjević, and Klopotan (2020) investigate the Fintech revolution in the financial industry in a literature review. Their main goals were to analyze and investigate the crucial role of digitalization and digital transformation and their impact on Fintech and to explore Fintech's innovation and novelty areas in the financial sector in Croatia and worldwide. They claim that the application of FinTech in the global market is "a huge challenge for the whole system and especially for the financial industry and the banking system." However, they claim "there is still an insufficient number of research and insight into how it will affect the existing financial industry as well as the business management models in the financial sector."

Pečarić, Peronja and Mostarac (2020) explore alternative methods of executing reimbursement loans, using digital technology methods such as FinTech, to improve the efficiency of the international exchange. In their study, they address the implementation of novel technologies, such as the "blockchain"/DLT (Distributed Ledger Technology) and "smart contracts," and propose a new reimbursement loan model based on these technologies. Moreover, their findings provide new insights since they examine the effectiveness of applying novel technologies by comparing both the conventional and unconventional reimbursement credit models in a real-case scenario. Ultimately, they found that adopting smart contracts and blockchain/DLT as "key parts (or new core features) of reimbursement bank's technical infrastructure could significantly reduce moral hazard and asymmetric information risk in bank-to-bank reimbursement."

Čulinović-Herc, Zubović and Derenčinović Ruk (2021) tackle the issue of the impact modern technologies (such as FinTech) have on intermediated securities. Their study relies on the Croatian national model and analyses the legal consequences and the existing system of keeping a securities register. This is a somewhat neglected but significant legal issue regarding FinTech in Croatia. They found that it is understandable and expected the application of blockchain technology to affect the market of intermediary services in the Croatian capital market. Traditional intermediaries should embrace new technology not to lose the race in the growing market.

Tušek, Ježovita and Halar (2021) investigate the opinion of internal and external auditors operating in the Republic of Croatia on their need for specialized education and expertise in blockchain technology. For this reason, they conducted an empirical survey on a sample of 172 external and internal auditors

in Croatia, as a continuation of their desk research, with the application of a multiple regression model and its solving with R. Their findings revealed that both external and internal auditors in Croatia believe they need a "high level of expertise in advanced analytical procedures (APs) in order to be able to audit blockchain-based business operations." They also tackle the instantaneously increasing auditors' demand for continuous education and upgrading their knowledge base in blockchain technology (BCT), APs, and data analytics (DAs).

Pakhnenko et al. (2021) conducted a rather appealing study to examine "the level of digitalization of financial services (DFSI) based on three components: digital inclusion, financial inclusion, and digital financial services" for European countries. Their proposed model categorized European countries into four groups: with a high, medium, low, and critically low level of digitalization of financial services. Croatia's results have pinned her among the European countries with a low level of DSFI.

Martinčević et al. (2022) have undertaken a systematic literature review to explore the state-of-the-art in cryptocurrencies accounting and tax regulation. Considering the topicality of this subject, their study offers outstanding scientific contribution and value. Their findings reveal insufficient regulation in cryptocurrencies' accounting and tax treatment and no consistency in the "implementation, monitoring, and evaluation of cryptocurrencies in the field of accounting at the local and global levels." Therefore, they address critical issues that offer practical contributions to local governments.

Apostu et al. (2022) conducted a fascinating cross-country study whose main objective is to identify the condition of the FinTech in the Balkan region (considering the various factors such as "the involvement of public authorities, the EU membership of only a few countries, the level of financial and digital education of the population"). In their study, a sample of eight Balkan countries is considered as follows: Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, Albania, Macedonia, Bulgaria, and Romania. The methodologies used are descriptives, ANOVA, cluster analysis, and principal components analysis. Their findings reveal that there are significant differences between Fintech and financial inclusion among these countries, which are predominantly due to the "differences being generated both by the public policies in the financial field but also by IT development and by the population openness for using the new financial services and products."

Sajter (2022) addresses one critical issue: is Bitcoin or a regular bank transfer more affordable when sending money overseas? This study compares and analyzes the fees for international money transfers via banks and the Bitcoin network. Thus, the question of "functionality and cost-effectiveness of an alternative financial system based on blockchain technology" is being answered. The data covers the period from 2018 to 2022, and the data from Croatian commercial banks and their fees for international bank transfers are drawn, together with the data on Bitcoin transfers in the same time frame. The findings revealed exciting insights: "On average, to send 1,000 USD abroad by using Bitcoin network required approx. three times less in fees than by using banks in Croatia". Moreover, the author found that international money transfer via the Bitcoin network "bears significantly lower costs for the end user, especially when transferring a lower amount."

Vinšalek Stipić and Vičić (2022) have tackled the subject of the impact of blockchain technology on the accounting information system. Even though their study is primarily theoretical, it covers some essential subjects, such as the classification of blockchain technology (public blockchains, private blockchains, consortium blockchains, and hybrid blockchains), the upsides and downsides of the blockchain technology, the changes of accounting practices in a digital era, and the application of blockchain technology in accounting (in Croatia and globally). They focus on the concept of the Triple-Entry Accounting system, its advantages, and its disadvantages, and tackle the immense importance of further education of accountants and students for blockchain technology. They claim that blockchain technology and the Triple-Entry Accounting system could offer more secure, more efficient and correct data due to the specific way of noting and saving accounting data, making blockchain application in accounting unquestionable.

Martinčević, Črnjević and Klopotan (2022) investigate the crucial role of digitalization and digital transformation and its impact on FinTech and explore the innovation and novel areas of FinTech applied in the financial sector. They also provide with extensive literature review on the areas mentioned above. They tackle the shared FinTech innovations applied in the financial sector, such as Hybrid cloud, API (Application Programming Interface) platform, Automation of robotic processes, Artificial Intelligence, Blockchain, Quantum computing, and VR (virtual reality) and AR (augmented reality). Moreover, they identified the building blocks of FinTech products as follows Blockchain, Cryp-

tocurrencies, Technology support (Big data, cloud, artificial intelligence), and Banking support (Virtual banking, neobanking, open banking, digital wallet). The significant contribution from their systematic literature review mirrors the fact that they found FinTech and its products, such as blockchain technology, bitcoin, and neo banks, to be crucial in the process of an operational increase of efficiency and excellence.

5. DISCUSSION AND CONCLUSION

All of the surveyed 14 papers have been published after 2018, i.e., one paper per year in 2018 and 2019, 4 in 2020, 3 in 2021, and 5 in 2022 (as shown in Figure 2). This is understandable because blockchain technology is novel, and its application in the Croatian financial sector and industry is still limited.

Figure 2. The number of published papers regarding the application of blockchain technology and FinTech in finance literature in Croatia in 2018 – 2022.
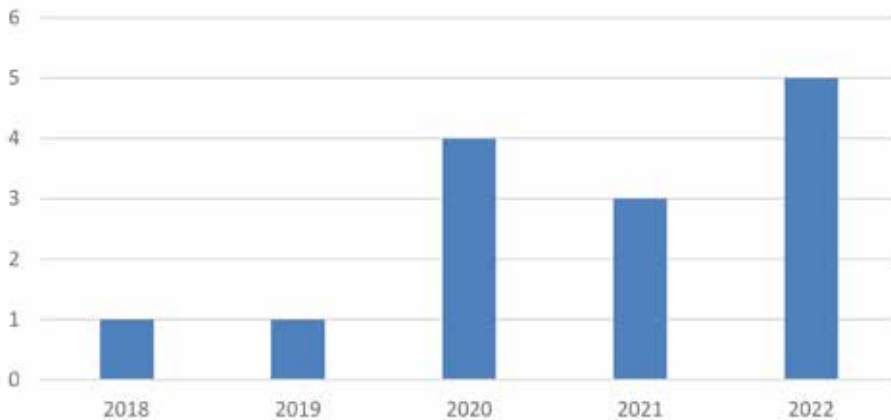
Source: Authors' work.

Most of these papers (i.e., out of 14) are published in a journal. A complete tabular list of the type of papers and the source (journal/conference) is given in Table 2.

Moreover, two surveyed papers (Merkaš et al., 2020 and Martinčević et al., 2022) have been published in the International Journal of E-Services and Mobile Applications. Another two papers (Tušek, et al. 2021 and Sajter, 2022) were published in a special conference issue of the Zagreb International Re-

view of Economics & Business. Lastly, the studies of Juričić et al. (2019) and Martinčević et al. (2020) were both published in the Proceedings of the EN-TRENOVA - ENTerprise REsearch InNOVAtion Conference. Thus, this study has identified the venues that publish studies regarding blockchain technology and FinTech in Croatia.

Table 2. Types of paper and publication of the surveyed papers.

Authors	Type of paper	Published in
Cunjak Mataković & Mataković, 2018	Journal article	*International Journal of Digital Technology & Economy 3* (1)
Juričić, Radošević & Fuzul, 2019	Conference paper	*Proceedings of the ENTRENOVA - ENTerprise REsearch InNOVAtion Conference*
Juričić, Radošević & Fuzul, 2020	Journal article	*Business systems research 11* (3)
Merkaš, Perkov & Bonin, 2020	Journal article	*International Journal of e-services & mobile applications, 12* (1)
Martinčević, Črnjević & Klopotan, 2020	Conference paper	*Proceedings of the ENTRENOVA - ENTerprise REsearch InNOVAtion Conference*
Pečarić, Peronja & Mostarac, 2020	Journal article	*Pomorstvo: scientific journal of maritime research, 34* (1)
Čulinović-Herc, Zubović & Derenčinović Ruk, 2021	Journal article	*Godišnjak Akademije pravnih znanosti Hrvatske = Yearbook Croatian Academy of Legal Sciences, XII* (1)
Tušek, Ježovita & Halar, 2021	Conference paper	*Zagreb International Review of Economics & Business, Vol. 24, Special Conference Issue*
Pakhnenko et al., 2021	Journal article	*Journal of International Studies 14*(2)
Martinčević et al., 2022	Journal article	*Interdisciplinary description of complex systems 20* (5)
Apostu et al., 2022	Journal article	*Electron j inf syst dev ctries*
Sajter, 2022	Conference paper	*Zagreb International Review of Economics & Business, Vol. 25, Special Conference Issue*
Vinšalek Stipić & Vičić, 2022	Conference paper	*Proceedings of the 8th International Conference "Vallis Aurea": Focus on: Tourism and Rural Development*
Martinčević, Črnjević & Klopotan, 2022	Journal article	*International Journal of E-Services and Mobile Applications 14* (1)

Source: Authors' work.

In addition to this research, an analysis of the most contributing authors on this subject has been conducted. Namely, authors Martinčević (with three published papers), Črnjević and Klopotan (with two published papers), and Juričić, Radošević and Fuzul (with two published papers) have mainly contributed the scholarly literature in this research area.

As for the findings, a summary of their most crucial findings is given in Table 3 below.

Table 3. A summary of the most important findings regarding the application of blockchain technology and FinTech in finance literature in Croatia in 2018 – 2022.

Authors	Main concepts and findings
Cunjak Mataković & Mataković, 2018	Ponzi schemes can also be successfully applied within the framework of complex information technology such as blockchain.
Juričić, Radošević & Fuzul, 2019	There is an excellent potential for the so-called "non-standard usage" of blockchain, i.e., the potential use of blockchain technology and its computing technology in many different areas, such as medicine, biology, and finance.
Juričić, Radošević & Fuzul, 2020	Optimization of resource consumption of blockchain in business systems and identification of one of the most significant subjects to criticism: the Hashcash algorithm commonly used in the proof of work consensus.
Merkaš, Perkov & Bonin, 2020	Applying blockchain technology combined with IoT results in better "business process optimization, supply chain traceability and transparency, and significant financial savings."
Martinčević, Črnjević & Klopotan, 2020	"There is still an insufficient number of research and insight into how it will affect the existing financial industry as well as the business management models in the financial sector."
Pečarić, Peronja & Mostarac, 2020	Adopting intelligent contracts and blockchain/DLT as "key parts (or new core features) of reimbursement bank's technical infrastructure could significantly reduce moral hazard and asymmetric information risk in bank-to-bank reimbursement."
Čulinović-Herc, Zubović & Derenčinović Ruk, 2021	Blockchain technology is expected to affect the intermediary services market in the Croatian capital market. Traditional intermediaries should embrace new technology to avoid losing the race in the growing market.
Tušek, Ježovita & Halar, 2021	Further specialized education is required to obtain the necessary skills to use Aps (analytical procedures) and DAs (data analytics) to audit BCT (blockchain technology).
Pakhnenko et al., 2021	Croatia experiences a low level of DSFI (digitalization of financial services).

Martinčević et al., 2022	There is insufficient regulation in the accounting and tax treatment of cryptocurrencies, and there is no consistency in the "implementation, monitoring, and evaluation of cryptocurrencies in the field of accounting at the local and global levels."
Apostu et al., 2022	There are significant differences between Fintech and financial inclusion among Balkan countries, predominantly due to the "differences being generated both by the public policies in the financial field but also by IT development and by the population openness for using the new financial services and products."
Sajter, 2022	International money transfer via the Bitcoin network "bears significantly lower costs for the end user than a bank transfer, especially when transferring the lower amount."
Vinšalek Stipić & Vičić, 2022	The application of blockchain technology and the Triple-Entry Accounting system in accounting is ever-growing and should be used due to the many benefits and upsides of the technology in the accounting industry.
Martinčević, Črnjević & Klopotan, 2022	FinTech and all of its byproducts affect the business process of companies in the financial sector by increasing operational efficiency and excellence.

Source: Authors' work.

Financial innovation, FinTech, and current topical technologies (such as Artificial intelligence, machine learning, mobile applications, cloud computing, and big data analytics) have enabled new services and business models to occur and prosper. Moreover, these technologies bring multiple advantages to both end-consumers and organizations. Namely, end-consumers enjoy the more excellent offer and easier access to financial services, whereas organizations could benefit from the efficiency increase in their day-to-day operations (Pejić Bach, 2019). Since Blockchain technology and FinTech are buzz-worthy and relevant research areas, the main objective of this study was to survey, review and analyze the empirical and theoretical finance literature on blockchain technology and FinTech in Croatia. The purpose of the paper was to fill in the literature gap, investigate the state of the art and organize the status of research already conducted on financial technology and blockchain in Croatia to provide easy access and inspiration to future researchers.

The most significant limitations of this article are as follows: Even though two of the most reputable and renowned scientific databases (i.e., the Scopus and Web of Science databases) were surveyed, as well as the Croatian Scientific Bibliography (CROSBI), there still is a possibility that not all the relevant published work regarding the application of blockchain technology and FinTech in finance in Croatia have been identified and thereby presented in this study.

Moreover, in future work, the authors plan to conduct an empirical study regarding the efficiency of already applied blockchain technologies and FinTech in the financial sector in Croatia.

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FINANCIAL SOUNDNESS OF CROATIAN INSURANCE COMPANIES AND INSURANCE SECTOR DURING THE PRE-PANDEMIC AND PANDEMIC PERIOD PRESENTED BY CARAMEL MODEL

Nikolina SMAJLA, Ph.D.
Karlovac University of Applied Sciences,
Business Department, Republic of Croatia

E-mail: nikolina.smajla@vuka.hr

Abstract

The main goal of insurance companies' business is risk mobilization from companies and individuals and lowering risks to the whole economy. The financial soundness of insurance companies is key to the success and stability of the financial sector as a whole. Therefore regulators need to evaluate their business and develop appropriate models for measuring the financial soundness of this part of the financial sector, especially in times of greater business risks such as the pandemic.

In this paper, the authors represent the research results on the financial soundness of insurance companies in Croatia in recent years - comparing the pre-pandemic and pandemic periods. The primary purpose of this paper is to explain the CARAMEL model, one of the recent models used for measuring the financial soundness of insurance companies, and to understand the level of soundness of Croatian insurance companies. Conclusions regarding given categories of the financial soundness of insurance companies and the whole insurance sector will be made based on data from the financial statements of insurance companies. At the end of the paper, recommendations for further research are made.

Keywords: insurance companies, financial indicators, CARAMEL model

JEL Classification: G22

1. INTRODUCTION

Insurance companies' primary business is taking risks from individuals and companies to reduce risks in the entire economy based on pooling and diversification. It also strengthens the linkages with other sectors of the economy, promoting growth and stability and creating a sizeable impact on the national income of the country (Simpson & Damoah, 2008: 2). Individuals or companies can reduce their risk by forming a pooling arrangement which is not costless to operate – the cost of organizing and operating pooling arrangements is the main reason why insurance companies exist and why most pooling arrangements take place indirectly through insurance contracts (Harrington & Niehaus, 2004: 63). Insurance activity is characterized by the reversal of the production cycle because premiums are collected when the contract is signed, and claims and costs arise only if a specific event occurs (Simpson & Damoah, 2008: 3).

After a slowdown in 2020, the insurance industry experienced renewed premium growth in 2021, especially in the life sector (OECD, 2023). A second year into the pandemic, gross premiums written by insurers rebounded, especially in the life sector. COVID-19 continued to affect pay-outs from life and non-life insurance policies in 2021, although to different extents across jurisdictions and lines of business. The economic recovery in 2021 and the easing of COVID-19-related movement restrictions led to more significant amounts of claims paid. Insurers still achieved underwriting profits in the non-life sector in most reporting jurisdictions in 2021 (OECD, 2023).

Insurance companies in the Republic of Croatia had a relatively modest reaction to the COVID-19 crisis, especially in non-life insurance. The decline in premiums was felt in life insurance, but non-life insurance was canceled out by the increase in premiums due to the devastating earthquakes. Non-life insurance premiums were primarily generated by the growth of liability insurance premiums for the use of motor vehicles, fire insurance and natural damage and other property insurance, which was undoubtedly influenced by the experience of devastating earthquakes.

According to the Croatian Financial Services Supervisory Agency, the insurance sector in Croatia was always stable, and the liquidity and solvency of insurance companies were and still are at a satisfactory level.

2. EVALUATION OF INSURANCE COMPANIES' FINANCIAL SOUNDNESS

Evaluation of the financial soundness of the insurance sector is made to explore risks to which insurers are exposed due to their core business and to find a way to manage them. Except for underwriting risks accepted by insurers, insurance companies are exposed to investment and non-technical risks such as management and business risks and legal risks.

Supervisors and regulators worldwide have developed different models to evaluate and control the business activities of insurance companies. In many jurisdictions, the regulators evaluate insurers from their financial reports usually used in accountancy: balance sheet, profit and loss account and additional notes, and different (annual, quarterly, monthly) statements concerning solvency margin, premium income, losses, reserves etc. (Smajla, 2014). Some indicators used for evaluating the financial health of insurers are Financial soundness indicators developed by International Monetary Fund.

2.1. FINANCIAL SOUNDNESS INDICATORS

In the late 1990s, the International Monetary Fund (IMF) launched an ambitious data collection effort - the Financial Soundness Indicators (FSIs) - to monitor the soundness of the system-wide financial sector. The FSIs included indicators of capital adequacy, asset quality, profitability, liquidity, and market risk sensitivity (IMF, 2019).

Financial soundness indicators (FSI) are indicators of the financial stability of the financial institution (World Bank; IMF, 2005). They can be measured for individual institutions and the whole market in which they operate. The main goal of the calculation of FSIs is to support macroprudential analysis, to assess and ensure surveillance of the strengths and vulnerabilities of the financial system, to enhance financial stability and to limit the likelihood of a failure of the financial system. International Monetary Fund has guided the concepts, definitions, sources, and techniques for compiling and disseminating the FSI (Compilation Guide on Financial Soundness Indicators, IMF, 2004). It discusses the distinction between a "core set," for which data are generally available. It is found to be highly relevant for analytical purposes in almost all countries and an "encouraged set" for which data are not as readily available and whose relevance could vary across countries (World Bank, IMF, 2005).

2019 Financial Soundness Indicators Compilation Guide (IMF, 2019) includes new indicators to expand the coverage of the financial sector, including other financial intermediaries, money market funds, insurance corporations, pension funds, nonfinancial corporations, and households. In all, the Guide recommends the compilation of 50 FSIs, 13 of them new. Additions such as new capital, liquidity and asset quality metrics, and concentration and distribution measures will enhance the forward-looking aspect of FSIs and increase policy focus on the financial system's stability (IMF 2019).

FSIs are a comprehensive set of indicators used in economic statistics that reflect various influences. Some concepts are drawn from prudential and commercial measurement frameworks, which have been developed to monitor individual entities. Other concepts are drawn from macroeconomic measurement frameworks, which have been developed to monitor aggregate economic activity.

FSIs are indicators of the financial health and soundness of a country's financial institutions and their corporate and household counterparts. They include both aggregated individual institution data and indicators that are representative of the markets in which the financial institutions operate. Supervisory data are essential sources for the calculation of FSIs. FSIs are calculated and disseminated to support macroprudential analysis. They focus on indicators of financial soundness directly relevant to the financial sector. The reason is twofold: FSIs have traditionally been associated with financial institutions, and the necessary data sources are sufficiently available (IMF, 2019).

2.2. Financial soundness indicators for insurance companies – CARAMEL model

FSIs used for the banking sector are known as the CAMELS framework (Capital adequacy, Asset quality, Management soundness, Earnings and profitability, Liquidity and Sensitivity to market risk) and are routinely used and have shown promising results in financial soundness measurement.

In insurance companies' performance, quantitative soundness indicators are presented in the CARAMEL framework (Capital adequacy, Asset quality, Reinsurance, Adequacy of claims and actuarial, Management soundness, Earnings and profitability and Liquidity), which adds the reinsurance and actuarial part to the CAMELS framework. The CARAMEL method is a framework insurance companies use to assess their financial health and make necessary adjust-

ments to ensure their long-term viability. Capital Adequacy refers to the insurer's ability to meet its financial obligations. Asset Quality refers to the quality of the insurer's investments, such as bonds and stocks. Reinsurance refers to the insurer's ability to share risk with other companies. Adequate Reserves refer to the insurer's ability to set aside enough money to pay future claims. Management and Leadership refer to the quality of the insurer's management team. Earnings refer to the insurer's profitability. Moreover, Liquidity refers to the insurer's ability to meet short-term obligations.

Although the overall financial soundness of the financial institution depends on many factors, such as quality of management or organizational structure, these indicators are verified to achieve an acceptable degree of reliability (Das, Davies & Podpiera, 2003: 21). Many of them are common for life and non-life insurance companies. However, it is essential to realize that different business lines must be analyzed separately for deeper analysis.

Table 1: Insurance Financial Soundness Indicators: Core Set

Category	Indicator	Non-life	Life
Capital adequacy	Net premium/capital	X	
	Capital/total assets	X	
	Capital/technical reserves		X
Asset quality	(Real estate + unquoted equities + debtors)/total assets	X	X
	Receivables/(Gross premium+ reinsurance recoveries)	X	X
	Equities/total assets	X	X
	Nonperforming loans to total gross loans		X
Reinsurance and actuarial issues	Risk-retention ratio (net premium/gross premium)	X	X
	Net technical reserves/average of net claims paid in last three years (survival ratio)	X	
	Net technical reserves/average of the net premium received in the last three years		X
Management soundness	Gross premium/number of employees	X	X
	Asset per employee (total assets/number of employees)	X	X
Earnings and profitability	Loss ratio (net claims/net premium)	X	
	Expense ratio (expense/net premium)	X	X
	Combined ratio = loss ratio + expense ratio	X	
	Revisions to technical reserves/technical reserves		X
	Investment income/net premium	X	
	Investment income/investment assets		X
	Return on equity (ROE)	X	X
Liquidity	Liquid assets/current liabilities	X	X

Source: Das, Davies & Podpiera, 2003: 28

Compared to other frameworks used for the financial evaluation of insurers (Simpson & Damoah; 2008: 12), the CARAMEL model has developed two significantly essential parts of analysis: the issue of management soundness and the actuarial issue. According to Das, Davies and Podpiera (2003), sound management is vital in the assessment of the financial strength of an entity. It is crucial for insurers' financial stability, though it is challenging, to find any direct quantitative measure of management soundness. The core set of Insurance Financial Soundness Indicators uses the "survival ratio" (net technical reserves to the average of net claims paid in the last three years) for non-life insurance, which shows the quality of the company's estimate of the value of the reported and outstanding claims.

3. INSURANCE SECTOR OF THE REPUBLIC OF CROATIA

The Republic of Croatia's insurance sector is regulated by Croatian Financial Services Supervisory Agency (CFSSA). It had grown rapidly from 2003 till 2008 when it started perceiving the influence of economic crisis in the country. The gross written premium grew from 2003 to 2008 at more than 10% and then grew slower. From 2009 to 2021, the gross written premium is increasing. It has increased by EUR 433 million in the observed period, or about 35%. During the pandemic period, the insurance premium decreased slightly in 2020. compared to 2021 (it decreased by 0.06%). The total gross premium written at the end of 2022 was 1,682,322 thousand euros.

From 2019 to 2022, there is a noticeable decrease in the collected premium in 2020 compared to 2021, after which the premium increases again in all years. Non-life insurance premiums are increasing in all observed years, regardless of the impact of COVID-19.

The Croatian insurance sector in 2022 consisted of 14 insurance companies. Two of them conducted life assurance business only, four insurance companies carried on non-life insurance only, and eight companies carried on both life and non-life business (composite companies).

4. USING THE CARAMEL MODEL IN CROATIAN INSURANCE COMPANIES

Financial evaluation of insurers in the Republic of Croatia hereafter will be made using the CARAMEL methodology. Although some indicators are similarly used by Croatian Financial Services Supervisory Agency, the whole methodology is not used in Croatia. Data for the analysis is taken from the annual financial statements of insurance companies publicly published online. FSIs have been calculated according to Das, Davies and Podpiera's methodology, taking into account differences between life, non-life and composite companies, and are presented in Tables 2, 3 and 4. Suppose an indicator has to be calculated only for, for example. In that case, non-life and composite companies have also been considered because they carry on life and non-life businesses.

Table 2: Insurance Financial Soundness Indicators for non-life companies, 2019-2022

Category	Indicator	2018	2019	2020	2021	2022
Capital adequacy	Net premium/capital	0.83	0.89	0.88	0.95	1.04
	Capital/total assets	0.44	0.44	0.43	0.42	0.42
	Capital/technical reserves	-	-	-	-	-
Asset quality	(Real estate+unquoted equities+debtors)/total assets	0.46	0.48	0.48	0.47	0.45
	Receivables/(Gross premium+reinsurance recoveries)	0.44	0.37	0.35	0.35	0.32
	Equities/total assets	0.17	0.17	0.16	0.15	0.12
	Nonperforming loans to total gross loans	-	-	-	-	-
Re-insurance and actuarial issues	Risk-retention ratio	0.87	0.86	0.85	0.85	0.86
	Net technical reserves/ average of net claims paid in last three years (survival ratio)	4.41	4.12	4.26	4.88	4.15
	Net technical reserves/ average of the net premium received in the last three years	-	-	-	-	-
Management soundness	Gross premium/number of employees (Eur)	826,451	907,556	989,537	1,144,639	1,264,192
	Asset per employee (Eur)	2,906,909	2,995,931	3,124,295	3,299,971	3,769,465

	Loss ratio	0.46	0.50	0.43	0.43	0.53
	Expense ratio	1.11	1.09	1.03	0.86	1.06
	Combined ratio	1.57	1.59	1.46	1.29	1.59
Earnings and profitability	Revisions to technical reserves/technical reserves	-	-			
	Investment income/net premium	0.12	0.12	0.11	0.10	0.09
	Investment income/ investment assets	-	-	-	-	-
	Return on equity (ROE)	6.87	7.72	7.97	8.75	9.41
Liquidity	Liquid assets/current liabilities	3.69	2.75	2.58	2.69	2.70

Source: author's analysis according to data from annual financial statements of insurance companies

Table 3: Insurance Financial Soundness Indicators for life companies, 2019-2022

Category	Indicator	2018	2019	2020	2021	2022
Capital adequacy	Net premium/capital	-	-	-	-	-
	Capital/total assets	0.31	0.32	0.31	0.31	0.30
	Capital/technical reserves	0.49	0.47	0.48	0.49	0.46
Asset quality	(Real estate+unquoted equities+debtors)/total assets	1.03	1.08	0.95	0.96	1.00
	Receivables/(Gross premium+reinsurance recoveries)	0.10	0.10	0.15	0.13	0.13
	Equities/total assets	0.14	0.14	0.13	0.12	0.12
	Nonperforming loans to total gross loans	-	-	-	-	-
Re-insurance and actuarial issues	Risk-retention ratio	1.00	0.99	0.99	0.99	0.88
	Net technical reserves/ average of net claims paid in last three years (survival ratio)	-	-	-	-	-
	Net technical reserves/ average of the net premium received in the last three years	3.49	4.17	3.59	3.46	2.95
Management soundness	Gross premium/ number of employees (Eur)	1,975,202	2,158,942	1,959,125	2,135,250	2,239,067
	Asset per employee (Eur)	10,505,769	11,094,522	11,809,373	11,851,087	11,044,600

Earnings and profitability	Loss ratio	-	-	-	-	-
	Expense ratio	1.17	1.17	1.12	1.06	1.25
	Combined ratio	-	-	-	-	-
	Revisions to technical reserves/technical reserves	-0.02	-0.05	0.01	0.00	0.03
	Investment income/net premium	-	-	-	-	-
	Investment income/ investment assets	0.08	0.08	0.07	0.04	0.04
	Return on equity (ROE)	1.36	1.58	1.16	1.08	1.36
Liquidity	Liquid assets/current liabilities	1.53	1.69	6.74	6.06	4.59

Source: author's analysis according to data from annual financial statements of insurance companies

Table 4: Insurance Financial Soundness Indicators for composite companies, 2019-2022

Category	Indicator	2018	2019	2020	2021	2022
Capital adequacy	Net premium/capital	1.10	1.01	0.88	1.01	1.96
	Capital/total assets	0.18	0.19	0.19	0.18	0.13
	Capital/technical reserves	-	-	-	-	-
Asset quality	(Real estate+unquoted equities+debtors)/total assets	0.75	0.74	0.74	0.75	0.79
	Receivables/(Gross premium+reinsurance recoveries)	0.29	0.30	0.28	0.27	0.23
	Equities/total assets	0.05	0.05	0.04	0.04	0.05
	Nonperforming loans to total gross loans	-	-	-	-	-
Re-insurance and actuarial issues	Risk-retention ratio	0.86	0.85	0.88	0.88	0.84
	Net technical reserves/ average of net claims paid in last three years (survival ratio)	6.68	6.61	6.50	6.19	6.21
	Net technical reserves/ average of the net premium received in the last three years	-	-	-	-	-
Management soundness	Gross premium/number of employees (Eur)	1,350,636	1,463,568	1,250,329	1,377,914	1,684,218
	Asset per employee (Eur)	6,997,525	7,594,583	7,778,588	7,833,087	7,461,399

	Loss ratio	0.71	0.77	0.87	0.84	0.68
	Expense ratio	1.10	1.10	1.16	1.18	1.04
	Combined ratio	1.81	1.86	2.04	2.02	1.72
Earnings and profitability	Revisions to technical reserves/technical reserves	-	-	-	-	-
	Investment income/net premium	0.22	0.23	0.23	0.20	0.13
	Investment income/ investment assets	-	-	-	-	-
	Return on equity (ROE)	6.19	6.62	6.30	6.85	6.73
Liquidity	Liquid assets/current liabilities	2.18	1.69	2.21	1.62	1.56

Source: author's analysis according to data from annual financial statements of insurance companies

Listed hereafter, indicators are explained for each category separately.

1. Capital promotes the stability and efficiency of the financial system and indicates whether the insurance company has enough capital to absorb losses arising from claims. A higher capital adequacy ratio means capital is sufficient for the business's smooth running (Ghimire, 2013: 3).

   The first indicator in the category of capital adequacy (net premium/capital) is calculated only for non-life and composite companies. It amounts from 0.83 to 1.04 for non-life companies and 0.88 to 1.96 for composite companies. There is not much difference in this indicator over the years, except for composite companies in the year 2020 (the lowest indicator, 0.88) which can be due to lower premiums collected during the pandemic period. The second indicator shows the ratio of capital to total assets. For all types of companies, it remains stable in all observed years. The third indicator (ratio of capital to technical reserves) is calculated for life companies and is stable for all observed years, not influenced by the pandemic.

2. Indicators in the asset quality category do not show significant differences in pre-pandemic and pandemic periods, as well as in post-pandemic periods for all types of insurance companies.

3. Interesting indicators for insurance companies are those in the category of reinsurance and actuarial issues. The risk retention ratio (net premium/gross premium) measures how much risk is being carried by an

insurer rather than being passed to reinsurers. Non-life companies have ceded 13% to 15% of the risk to reinsurers (risk retention ratio equals 0.85 to 0.87), composite companies 12% to 15% (risk retention ratio equals 0.85 to 0.88), and life insurance companies have ceded almost nothing (their risk retention ratio is 0.99). Like in almost all other indicators, there is no significant difference in the pre-pandemic and pandemic periods.

4. As noted before, the management soundness issue is a significantly important part of the analysis in the CARAMEL model. The first indicator, Gross written premium, compared to several employees, shows how much premium is collected per employee in the company. It is a good indicator of management soundness because it is essential to have an appropriate number of employees who can collect a significant amount of premiums; in other words, management efficiency and soundness are the outcomes of the operational efficiency of the company (Ghimire, 2013: 3). For non-life companies the indicator is growing in all observed years (from 826 to 1.264 t Euro). For life companies, there is a visible decrease in 2020 (1.959 t Euro in 2020 vs. 2.159 t Euro in 2019), after which the indicator increases again. In composite companies, the trend is similar – the decrease in 2020 (1.250 t Euro in 2020 vs. 1.463 t Euro in 2019) followed by an increase in all other years.

Asset per employee is another indicator of management soundness issue connected to the number of assets per employee. Non-life companies' asset per employee rises in all years (from 2.907 to 3.769 t Euro). For life, companies are bigger in all years, rising from 10.506 to 11.045 t Euro), and for composite companies is slightly falling in 2022 (rising from 6.998 to 7.883 t Euro). The management soundness indicators do not show the pandemic's impact on insurance companies operations.

5. By category of earnings and profitability, there is a set of seven indicators that show how profitable insurance companies are. The loss ratio is the most commonly used indicator, representing the ratio of losses to premiums earned. For non-life companies, it is slightly bigger in 2019 (0.50 compared to 0.46 in 2018 and 0.43 in 2020 and 2021), which can be due to devastating earthquakes that caused higher claims paid. For composite companies, the loss ratio has been rising in all years, so the indicators do not show the impact of the pandemic.

Return on equity is the biggest for composite companies, rising in all years (6.87 in 2018 to 9.41 in 2022), independent of pandemic movements. The lowest indicator is for non-life companies due to negative trends in investment incomes.

6. The epidemic significantly impacted non-life and composite companies' liquidity indicators (liquid assets/current liabilities). For non-life companies, it has fallen from 3.69 in 2019 to 2.75 in 2020. In later years, it has slightly grown, not reaching the level of the pre-pandemic years. For composite companies, the indicator has fallen from 2.18 in 2019 to 1.69 in 2020. In 2021 it rose to 2.21, but it has fallen again to 1.62 and 1.56. For life, companies' indicator of liquidity has not fallen.

3. CONCLUSION

Although not used entirely by Croatian Financial Services Supervisory Agency, the CARAMEL model methodology is an excellent tool for understanding the financial soundness of Croatian insurance companies. Based on data from financial statements of insurance companies in the Republic of Croatia in the years 2019-2022, the level of soundness of Croatian insurance companies was not affected by the pandemic in most of the indicators.

Research results show that capital adequacy, asset quality, reinsurance, actuarial issues, management soundness, and earnings and profitability indicators are stable for all observed years, not influenced by the pandemic. Only liquidity indicators have been affected slightly by the pandemic, for non-life and composite companies, only in the year 2020. The results comply with the Croatian Financial Services Supervisory Agency report, which states that the insurance sector in Croatia was always stable, and the liquidity and solvency of insurance companies were and still are at a satisfactory level.

Some of the significant limitations of the study are concentration in one country. Therefore, recommendations for further research are to analyze for surrounding countries to make cross-country analyses using the same information for insurance companies to be more ready for similar challenges in the future.

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ANALYSIS OF THE WINE MARKET IN THE REPUBLIC OF CROATIA IN THE PROCESS OF INVESTMENT DECISION MAKING

Ivana MIKLOŠEVIĆ, Ph.D.
Financial Agency, Branch Office Našice

E-mail: ivana.miklosevic7@gmail.com

Maja VRETENAR COBOVIĆ, Ph.D.
University of Slavonski Brod

E-mail: mvcobovic@unisb.hr

Andreja KATOLIK KOVAČEVIĆ, Ph.D.
University of Slavonski Brod

E-mail:akkovacevic@unisb.hr

Abstract

Wine production is of economic importance for the Republic of Croatia as an activity that forms one of the critical components of the Croatian touristic eno-gastronomy offer. The high intensity of investment in the wine industry during the past decade has led to a significant increase in the quality of Croatian wines with constant efforts to maintain a sufficient level of price competitiveness on the market.

With Croatia's accession to the European Union in 2013, Croatian wine-makers' exposure to market competition increased significantly. In addition, the outbreak of the COVID-19 virus pandemic and the Russian invasion of Ukraine created unexpected disruptions in the market, which significantly hampered the operations of Croatian wineries and the realization of their development strategies.

Consideration and making of the necessary investment decisions in the technological development of the winery and other business decisions in the wine industry gained particular importance. There was a need to know detailed and specific data about the wine market in the Republic of Croatia.

Analyzing various official and business sources of information on the wine market in Croatia, a significant deviation between market information observed by wineries concerning publicly published data was observed, which makes it difficult to prove the profitability of investment projects and the realization of grants from European Union development funds. This research will collect and analyze various market indicators of viticulture and wine production in the Republic of Croatia. The actual values of grape and wine production and the amount of wine within the distribution channel will be determined to present the structure and critical indicators of wine production in Croatia.

Keywords: market, wine, profitability, investment, indicators

JEL Classification: E23, M11, L11

1. INTRODUCTION

The modern decision-making process, both in the business world and in making public policies, is based on the availability and accuracy of relevant official data created by European and national bodies responsible for collecting, processing and publishing data. Official statistics are vital in national and international frameworks because they provide users with a reliable data source for decision-making and harmonizing attitudes and behavior based on data that should be accurate, consistent, timely and collected without external influences and following international norms.

Concerning the membership of the Republic of Croatia in the European Union, particular emphasis is given to the role of the statistical system of the Republic of Croatia in the European statistical system and enabling the comparability of the statistical data of the Republic of Croatia with the statistical data of other member states of the European Union.

European and national public bodies, which deal with issues of grape and wine production and other indicators of the wine market, as well as entrepreneurs operating in the wine sector, have a great interest in using wine market statistics. The need is significantly pronounced in today's time of disruptions in

the international and national wine market caused by the epidemic of the Covid-19 virus, the withdrawal of the United Kingdom from membership in the European Union and the Russian invasion of Ukraine, when there was a need for quick and frequent adoption of important and timely business and political decisions.

Following the above, this work aims to determine the starting points and credibility of the key statistical indicators of viticulture and wine production in the Republic of Croatia and show the impact of the quality of data and information on decision-making in the viticulture and winemaking sector.

The importance of data quality and accuracy as the most common measure of information quality will also be checked. For the research, data on grape and wine production for 2021 and wine marketing for 2019, the last years for which we have the necessary data will be analyzed.

2. POSITION OF CROATIA IN THE FRAMEWORK OF THE EUROPEAN UNION WINE MARKET

The single internal market of the European Union is an important market for Croatian winemakers. At the same time, various agreements between the European Union and third countries define business terms on the markets of other countries of interest.

2.1. Production of grapes and wine in the European Union

The European Union is the world's largest wine producer, with 45% of the world's surface under vineyards, with an average annual production of 165 million hectoliters, and accounts for 65% of the world's production.

In 2020, vines were grown on 3.2 million hectares in the EU, approximately 45% of the world's total vineyard area.

**Table 1.** Data on viticulture production in the European Union in 2020

EU Member state	Surfaces under vines (ha)	Entrepreneurs in the wine sector (number)	Average area under vines (ha per entrepreneur)
EU*	3,194,614	2,227,672	1.43
Bulgaria	60,169	44,289	1.36
Czech Republic	18,099	16,541	1.09
Germany	103,554	35,093	2.95
Greece	103,058	193,284	0.53
Spain	910,859	483,749	1.88
France	792,565	75,153	10.55
Croatia	17,628	33,377	0.53
Italy	688,985	302,686	2.28
Cyprus	7,613	13,740	0.55
Luxemburg	1,294	279	4.64
Hungary	62,108	26,279	2.36
Austria	46,273	12,098	3.82
Portugal	173,254	114,220	1.52
Romania	180,683	844,015	0.21
Slovenia	15,363	28,498	0.54
Slovakia	13,108	4,371	3.00

* Countries with more than 500 hectares under vine
Source: Data processed by authors according to Eurostat, 2023

Among the 16 Member States that have areas under vines greater than the 500 ha threshold, Spain (with 0.9 million hectares), France (0.8 million ha), and Italy (0.7 million ha) together own almost three quarters (74.9 %) of the surfaces under vines in the European Union.
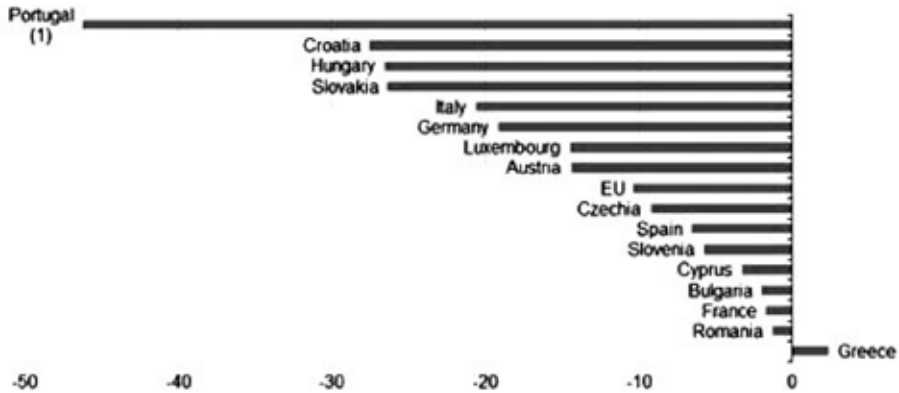
Figure 1. Change in the area under vines in the EU in the period from 2015 to 2020 (in %)
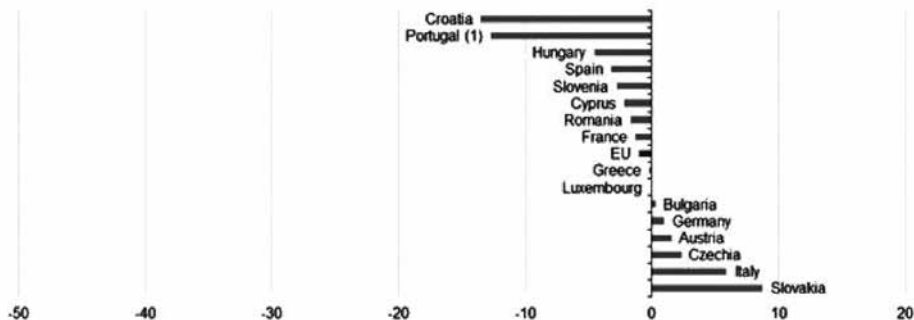
Source: Eurostat, 2023

In 2020, there was a change in the data source and surfaces. Even though the area under vines in the European Union remained relatively stable between 2015 and 2020 (-1.1%), some member countries, including Croatia, are facing a significant decrease in areas.

Figure 2. Change in the number of entrepreneurs in the wine sector in the EU in the period from 2015 to 2020 (in %)

Source: Eurostat, 2023

In 2020, there was a change in the data source and surfaces. Also, there was a sharp reduction in vineyard owners across the EU by 257,000 entities. Between 2015 and 2020, the number of vineyard owners downfall in most Member States, especially in Portugal (loss of 98,000 properties), Italy (loss of 78,000 properties) and Spain (loss of 34,000 properties). Most of the downfall was among small grape producers, with a size under 1 ha, by 226,000 less than in 2015.

Table 2. Wine production in leading EU countries in the period from 2019 to 2022 (in 000 hl)

EU Member state	Wine production in 2019	Wine production in 2020	Wine production in 2021	Wine production in 2022
EU	**156,497**	**170,598**	**158,683**	**165,691**
Italy	47,546	49,066	50,416	50,110
France	42,299	45,785	37,132	44,356
Spain	37,289	45,906	39,374	40,743
Germany	8,218	8,405	8,448	8,940
Portugal	6,527	6,418	7,359	6,848
Romania	3,918	4,032	4,823	4,101
Hungary	2,743	2,913	3,082	2,900
Greece	2,425	2,283	2,469	2,127
Austria	2,324	2,398	2,460	2,527
Bulgaria	917	823	893	793
Slovenia	758	743	581	546
Croatia	525	660	526	561
Czech Republic	492	603	592	586
Slovakia	321	357	342	334
Cyprus	100	89	68	108
Luxemburg	75	97	98	86
Malta	13	12	11	15
Netherland	8	8	8	10

Source: Data processed by authors according to European Commission, Directorate General for Agriculture and Rural Development, Wine production and initial stocks

For years, the largest producer of wine was France, but recently it gave up its dominant position in favor of Italy. At the same time, the EU participates in 70 % of the world's wine export, which makes it the most important export product of the EU agri-food sector, with 7.6 % of the export value in 2020 (source European Commission, agriculture.ec.europa.eu).

Three countries, Spain, Italy and France, according to data from 2021, together exported 59.9 million hectoliters, which accounts for 54% of the world's wine exports. These countries recorded a significant increase in export value compared to 2020: France (+27 %), Italy (+13 %) and Spain (+10 %). They also account for 61% of total exports by value in 2021, compared to their share of 59 % in 2020.

After several years of decline in wine production in the European Union, significant efforts were made to ensure a leading role in the world through the reforms of the wine market in the period from 2008 to 2013 by implementing the following guidelines:

- "Increasing the competitiveness of wine producers from the European Union - strengthening the reputation of European wines and restoring market share in the Union and outside it,

- simpler, more transparent, and more effective market management rules to balance supply and demand,

- preserving the best traditions of European viticulture and strengthening its social and environmental role in rural areas." (European Commission, 2023)

As a result of the implemented reforms, wine production in the EU is significantly regulated and controlled by an extensive set of laws through all stages of wine production and marketing to ensure high quality and complete product traceability, consumer protection and regulation of market relations.

The set of legal guidelines for the production and marketing of wine is composed of basic regulations, delegated regulations and implementing regulations, guidelines, and legal interpretations, the most important of which are:

1. Regulation (EU) no. 1308/2013 of the European Parliament and the Council of December 17, 2013, on the establishment of a typical organization of the market of agricultural products and amended by Regulation (EU) no. 2021/2117.,

2. Regulation 1306/2013 of the European Parliament and the Council of December 17, 2013, on the financing, management and supervision of the common agricultural policy,

3. Commission Delegated Regulation (EU) 2019/934 of March 12, 2019, amending Regulation (EU) no. 1308/2013 of the European Parliament and the Council regarding wine-growing areas in which the alcohol strength can be increased, approved oenological procedures and restrictions applicable to the production and storage of vine products, the minimum percentage of alcohol for by-products and their disposal, and the publication of OIV records,

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4. Commission Delegated Regulation (EU) 2019/33 of October 17, 2018, amending Regulation (EU) no. 1308/2013 of the European Parliament and the Council regarding requirements for the protection of designations of origin, designations of geographical origin and traditional expressions in the wine sector, the procedure for submitting complaints, restrictions on use, changes to product specifications, cancellation of protection and labeling and presentation,

5. Commission Delegated Regulation (EU) 2018/273 of December 11, 2017, amending Regulation (EU) no. 1308/2013 of the European Parliament and of the Council concerning the program for approving the planting of vines, the register of vineyards, supporting documents and certification, the entry and exit register, mandatory declarations, notices, and publication of the information about which they are notified and concerning the corresponding controls and penalties, and

6. Commission Delegated Regulation (EU) 2016/1149 of April 15, 2016, amending Regulation (EU) no. 1308/2013 of the European Parliament and the Council regarding national support programs for the wine sector.

On July 1, 2013, the Republic of Croatia became a full member of the European Union, one of the most essential Croatian foreign policy goals. During the pre-accession negotiations, which lasted a full ten years, the implementation of the acquis communautaire of the European Union (French: Acquis Communautaire) was negotiated, i.e., the conditions under which Croatia will accept, apply, and implement the set of rights and obligations that make up primary and secondary legislation, including the application of notable time delays for complete harmonization of national legislation in a certain area.

The adoption and implementation of the acquis of the European Union in the field of winemaking and viticulture began with the adoption of the Act on the Organization of the Market as an umbrella regulation, which fully adopted the provisions of the European Union on the regulation of the market of all agricultural products, and was entirely regulated by the new Wine Law (Official Gazette, No. 32/19).

With the adoption of the Wine Law, European and national regulations in the sector of winemaking and viticulture were harmonized, and the legal basis for adopting regulations on competencies at the national level was regulated.

In addition to numerous previous problems, in 2020, the world was hit hard by the Covid-19 virus pandemic, which, in addition to threatening people's health, also brought economic problems. Despite numerous non-reimbursed support measures implemented by the European Union and the Republic of Croatia, numerous entrepreneurs operating in the wine sector faced great difficulties in their business because they were forced to stop delivering their products due to the complete suspension of the HoReCa industry. The suspension of sales affected the entire sales chain, from door-to-door sales to restaurants, hotels and bars.

The pandemic greatly impacted wine sales, and some outlets never reopened. It is estimated that Covid-19 directly impacted the reduction of the amount of wine sold in the European Union by around 30 %. When looking at the value of the wine sold, the reduction was even more significant because most of the wine assortment in retail chains consisted of wines of a lower price class. It is estimated that the decrease in the value of the wine sold was as much as 50 %.

The cancellation of events and festivals, the absence of tourist consumption, the stoppage of numerous sales channels and excessive stocks are some consequences that the Covid-19 restrictions have left on the wine sector. According to the survey "Prowein Business Report 2022 - The Effects of COVID-19", by the Institute for Wine and Beverage Research of the University of Geisenheim, conducted among experts from 49 countries, 77 % of hotels and restaurants had to be closed (at least temporarily), 25% of wine companies followed the same fate. Almost 60 % of wine companies reported business losses due to Covid-19 (70 % of the entrepreneurs at risk were small winemakers). Despite the growth of online sales channels, most wineries have been unable to recoup losses due to significant reductions through HoReCa, exports and tourism.

Figure 3. EU wine export in the period from 2010 to 2020 (in hl)
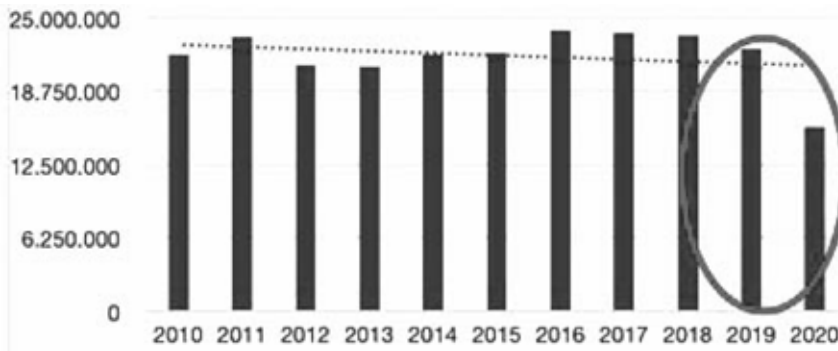
Source: European Commission, 2023

In the referendum held on June 23, 2016, the United Kingdom voted to leave the European Union, and the so-called Brexit entered into force at the beginning of 2021.

According to Eurostat data, Brexit created significant difficulties in the European Union's wine market because the United Kingdom represented 22 % of EU wine exports in 2019. Winemakers trading with the UK have faced new rules, paperwork and new checks since Brexit, which has led to a drop in sales.

A new shock on the wine market followed the beginning of the Russian invasion of Ukraine on February 24, 2022. European wineries lost much business due to sanctions, and exports to Russia, a significant export market before the war, were almost entirely suspended.

Every aspect of the winemaker's business has been seriously affected by the crisis, as the availability of numerous production inputs, including bottles, corks, packaging and more, has been disrupted. European glass factories operating in Ukraine and Russia are not producing at total capacity or not at all. It is difficult to find raw materials for pallets and packaging because most of the wood comes from Ukraine, Russia and Belarus, and rising energy costs have further influenced the rise in the prices of production inputs. There was an imbalance between supply and demand, reflected in the increase in wine prices and the decrease in sales volume.

3. ANALYSIS OF GRAPE AND WINE PRODUCTION IN THE REPUBLIC OF CROATIA

Wine production in the Republic of Croatia is a small part of the European scale, but for the Republic of Croatia, it has a doubly important meaning:

* wine-growing areas are primarily located in places where other crops cannot be grown, such as rocky and hilly terrains, which creates the conditions for the population to engage in economically profitable activities precisely in these places, and

* wine is an integral part of our tourist and gastronomic offer, i.e., Croatian exports through tourism.

Despite the multi-year increase in wine consumption during the tourist season, there has been a negative trend in the wine and viticulture sector in the Republic of Croatia for several years, both in vineyard areas and in wine production, as evident from the available statistical data.

Table 3. Data on viticulture production in the Republic of Croatia in the period from 2019 to 2022

	2017	2018	2019	2020	2021
Area (ha)	19,670.73	19,409.00	19,022.09	18,648.36	18,126.36
Number of winemakers	3,729	3,820	3,215	2,951	2,653
Production of grapes (t)	87,861.41	109,137.88	83,408.00	84,603.66	79,622.40
Wine production (hl)	575,939.75	732,578.35	524,596.81	660,028.92	525,751.41

Source: Data processed by authors according to the Viticulture Register of the Agency for Payments in Agriculture, Fisheries and Rural Development, 2023

According to the data of the Agency for Payments in Agriculture, Fisheries and Rural Development for the period from 2017 to 2021, the area under vineyards decreased by 1,544.37 ha (7.85 %), and the number of winemakers decreased by 1,076 subjects, i.e., a decrease is 28.85 %. In addition to respecting cyclicality due to climatic factors, the decreasing production of grapes and wine is also evident.

Table 4. Foreign trade in the wine sector of the Republic of Croatia in the period from 2017 to 2020

	2017		2018		2019		2020	
	Quantity (hl)	Value (EUR)	Quantity (hl)	Value (EUR)	Quantity (hl)	Value (EUR)	Quantity (hl)	Value (EUR)
Import	268,933	28,705,956	241,243	30,477,299	248,575	31,918,692	244,947	27,367,234
Export	51,664	13,101,145	56,856	16,134,906	52,675	15,949,589	34,619	12,574,332
Balance	-217,269	-15,604,811	-184,388	-14,342,393	-195,899	-15,969,103	-210,327	-14,792,902
Coverage	46%		53%		50%		46%	

Source: Data processed by authors according to Croatian Bureau of Statistics, 2023

In the part of foreign trade exchange, there was an increase in quantity and value of wine imports in the observed period of four years. On the other hand, wine exports did not follow such an increase in imports. At the same time, a significant increase in the number of imported wines in the market of the Republic of Croatia occurred after 2013 with the opening of the European Union market. However, the import of wine from third countries with bilateral agreements with the European Union and preferential treatment for wine imports also increased significantly.

Table 5. Import of wine from third countries to the Republic of Croatia in the 2020/2021 wine season

Country	Import quantity (hl)	Import value (000 EUR)	Average price (EUR/l)
North Macedonia	108,812	8,420	0.77
Kosovo	39,683	2,329	0.59
Bosnia and Herzegovina	29,556	2,407	0.81
Serbia	5,304	835	1.57
Montenegro	731	182	2.49
Chile	373	180	4.82
Moldavia	328	55	1.67
Argentina	311	168	5.41
South Africa	235	68	2.91
USA	90	102	11.40
Canada	26	21	8.14
Other third countries	48	147	30.63
Total/Average	**185.496**	**14.915**	**0.80**

Source: Data processed by authors according to Eurostat, 2023

Analyzing the import of wine from third countries, it has been found that the import of wine from North Macedonia, Kosovo and Bosnia and Herze-

govina makes up to 96% of the total wine import into the Republic of Croatia, with the Republic of Macedonia standing out, which imports almost 11 million liters of wine per year.

Additionally, it is essential to note that as much as 97.27% of wine export from Kosovo to the EU go to Croatia (90.01% of the value of EU imports). In contrast, the average prices per liter of wine are significantly lower than the lowest prices of wine production in the Republic of Croatia.

4. ANALYSIS OF MARKET INDICATORS OF VINEYARD AND WINE PRODUCTION IN THE REPUBLIC OF CROATIA

In addition to the external geopolitical problems and the pressure with the import of cheap wines, which created significant and severe difficulties for domestic wine producers, the problem of the gray market was added to the wine market of the Republic of Croatia, which significantly affected the process of considering and making the necessary investment and development decisions of wineries and other business decisions in the wine industry.

Considering the causes and volume of the gray market and analyzing publicly available data on the size of Croatian wine production, we observed significant discrepancies between the data used to show the market size. Primarily, we look at the data from the Viticulture Register at the Agency for Payments in Agriculture, Fisheries and Rural Development in relation to the Croatian Bureau of Statistics data.

4.1. Analysis of reported agricultural areas under vineyards

In the official data on production in the wine and viticulture sector in the Republic of Croatia, the area of commercial vineyards in Croatia is between 18 and 21 thousand hectares, depending on the data source.

According to the data of the Agency for Payments in Agriculture, Fisheries and Rural Development and the situation in the Viticulture Register on December 31, 2021, 18,126.36 ha of vineyards was planted in the Republic of Croatia, while according to the data of the Croatian Bureau of Statistics for 2021 in the Republic Croatia was planted 21,220 ha of vineyards.

Table 6. Agricultural areas under vines in Croatia in 2021

Wine region	Viticulture Register (2021) (ha)	Croatian Bureau of Statistics (2021) (ha)	Deviation	
			ha	%
Istria and Croatian Littoral	3,064.35	3,371	306.65	9.10
Share in %	16.91%	15.89%		
Dalmatia	5,593.67	6,861	1,267.33	18.47
Share in %	30.86%	32.33%		
Croatian Uplands	3,643.48	4,875	1,231.52	25.26%
Share in %	20.10%	22.97%		
Slavonia and Croatian Danube	5,824.87	6,113	288.13	4.71
Share in %	32.13%	28.81%		
Total	**18,126.34**	**21,220.00**	**3,093.66**	**14.58**

Source: Data processed by authors according to the Viticulture Register of the Agency for Payments in Agriculture, Fisheries and Rural Development and the Croatian Bureau of Statistics

Both sources of data are based on internationally recognized methodologies, but simultaneously, they show a significant discrepancy between the data presented. The Croatian Bureau of Statistics shows significantly larger areas than are recorded in the Viticulture Register. The total deviation of the area under vineyards in Croatia between the two registers is 3,093.66 hectares or 17.1 %. The most significant deviation was recorded in Croatian Uplands, with as much as 1,231.52 ha or 25.26 %, and the smallest in Slavonia and the Croatian Danube Region with 288.13 ha or 4.71 %.

4.2. Analysis of reported grape and wine production

According to the data of the Agency for Payments in Agriculture, Fisheries and Rural Development and the state in the Viticulture Register for the year 2021, the reported production was 525,751.41 hectoliters of wine, which is quite an underestimated amount considering the technology and potential of the vineyards.

According to the above data, the average wine production per hectare was only 2,900.48 liters.

Although the data on production reported to the Viticulture Register and CAAF's data on placing wine on the market are not entirely comparable, they are nevertheless significant in size deviation. The need to question the credibility of the data on the harvest and the final production of wine is justified because

the mathematical calculation says that it is a significant quantity of grapes, that is, the wine that ends up on the so-called gray market through unofficial channels, and the state treasury is left without significant income.

In order to determine the actual indicators of grape and wine production, we asked the Croatian Agency for Agriculture and Food for data on the average grape yield per hectare for each wine region so that we could make calculations and point out certain phenomena.

Table 7. Estimate of the average grape harvest by wine-growing regions in 2021

Istria and Croatian Littoral	Dalmatia	Croatian Uplands	Slavonia and Croatian Danube
8,778 kg	7,898 kg	9,917 kg	9,670 kg

Source: Croatian Agency for Agriculture and Food, 2023

Based on the data in Tables 6 and 7, we estimated the production of wine (0.65 liters per kg of grapes) for 2021 according to the area under vines in the Viticulture Register and the Croatian Bureau of Statistics. We made a mutual comparison and a comparison with the reported production for the year 2021.

Table 8. Deviation of wine production in 2021 compared to the estimated production

Wine region	Reported wine production in the Viticulture Register in 2021 (hl)	Estimated wine production in 2021, according to the vineyard area in the Viticulture Register (hl)	Estimated wine production in 2021 according to the area of vineyards in CBS (hl)	Deviation of the reported production from the estimated one (VR)		Deviation of the reported production from the estimated one (CBS)	
				hl	%	hl	%
Istria and Croatian Littoral	105,764	174,842	192,339	-69,078	39.51%	-86,575	45.01%
Dalmatia	79,764	287,162	352,223	-207,398	72.22%	-272,459	77.35%
Croatian Uplands	85,578	234,860	314,244	-149,282	63.56%	-228,666	72.77%
Slavonia and Croatian Danube	254,644	366,122	384,232	-111,478	30.45%	-129,588	33.73%
Total	**525,750**	**1,062,986**	**1,243,038**	**-537,236**	**50.54%**	**-717,288**	**57.70%**

Source: Data processed by authors according to Viticulture Register of the Agency for Payments in Agriculture, Fisheries and Rural Development, the Croatian Bureau of Statistics and the Croatian Agency for Agriculture and Food, 2023

A significant deviation was found. The reported wine production in 2021 is lower than the estimated wine production based on the areas in the Viticulture Register of 537,236 hl (50.54 %) and based on the areas of the CBS by as much as 717,288 hl (57.70 %).

4.3. Analysis of wine quantities according to sales channels

Based on the latest available data from the Croatian Agency for Agriculture and Food and data from the Nielsen Agency for wine retail market research, we checked the deviation of the wine quantities released to the market from the actual quantities in the 2019 wine year, as well as the impact on sales channels.

Table 9. Estimated wine market size and sales channels in the 2019 wine year

The total amount of wine placed on the market of the Republic of Croatia (in hl)	
Quantity placed on the market (CAAF)	554,346
Imported quantity of wine	186,065
Export of wine in packages smaller than 10 liters	-46,666
Wine on the market of the Republic of Croatia - total	**693,745**

The total amount of wine placed on the market of the Republic of Croatia minus the wine sold on the retail market (in hl)	
Wine on the market of the Republic of Croatia - total	693,745
Total sold wine on the retail market	354,779
The total amount of wine placed on the market of the Republic of Croatia minus the wine sold on the retail market	**338,966**

The total amount of wine available for sale in the HoReCa channel and on the "doorstep" (in hl)		
The total amount of wine placed on the market of the Republic of Croatia minus the wine sold on the retail market	338,966	
a. Number of wine producers who reported wine production		3,215
b. Estimated personal consumption per wine producer		10
c. Total estimated personal consumption (a x c)	32,150	
The total amount of wine available for sale in the HoReCa channel and on the "doorstep"	**306,816**	

The total amount of wine available for sale on the Croatian market (in hl)		
Estimated wine production in the Republic of Croatia	1,243,040	
+ Wine import	186,065	
- Export of wine in packages up to 10 liters	-46,666	
- Export of wine in packages over 10 liters	-10,190	
- Estimated own consumption	32,150	
The total amount of wine available for sale on the Croatian market	**1,404,399**	
Estimate of the wine quantity on the Croatian market of unknown quality and sales channel (in hl)		
The total amount of wine available for sale on the Croatian market	1,404,399	
Quantity placed on the market (CAAF)		554,346
- Total sold wine on the retail market	-354,779	
- Total amount of wine available for sale in the HoReCa channel and on the "doorstep"	-306,816	
Estimate of the wine quantity on the Croatian market of unknown quality and sales channel	**742,804**	

Source: Data processed by authors according to Viticulture Register of the Agency for Payments in Agriculture, Fisheries and Rural Development, the Croatian Bureau of Statistics, the Croatian Agency for Agriculture and Food and the Nielsen Agency for wine retail market research

Of the total wine sold on the market of the Republic of Croatia, as many as 742,804 hectoliters are of unknown quality and unknown sales channel.

4. CONCLUSION

In the last few years, accompanied by multiple challenging market disturbances, special attention has been paid to making business decisions in the wine sector. Measuring the quality of decisions intensified the need to monitor indicators in the wine market and analyze them as a direct link to business success.

The quality of information on the wine market is not unambiguously defined, and the basic determinants of quality information are its availability, relevance and reliability. Accordingly, the most important source of information on the wine market is public databases, primarily data from the Viticulture Register, the Croatian Agency for Agriculture and Food, and the Croatian Bureau of Statistics. Their importance is reflected in the data collection methodology, which provides a wide range of sector coverage and availability quickly.

Although public institutions that collect and process data should ensure their high level of accuracy, we have shown that specific data collection methodologies bring wrong and misleading results and can result in worse decisions than if they were made without data.

The conclusion of this paper and its purpose is not only to warn of observed errors in the data collection methodology but also to convey knowledge to public bodies in the Republic of Croatia and the European Union that collect, process and publish data on the wine market.

However, in practice, it is not always necessary or feasible to have data without a single error, and we have shown that users who are familiar with the data can often identify errors and, by analyzing and interpolating them obtain new information, which has a sufficient level of accuracy and thus becomes a valuable tool in decision-making.

This becomes more important in times of sudden market changes when every available piece of data enables the creation of information crucial for the regular and successful functioning of entrepreneurs in the wine market.

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THE RELATIONSHIP BETWEEN INTELLECTUAL CAPITAL AND FINANCIAL PERFORMANCE: EVIDENCE FROM CROATIA

Adriana GALANT, Ph.D.
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković"

E-mail: adriana.galant@unipu.hr

Ksenija ČERNE, Ph.D.
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković"

E-mail: ksenija.cerne@unipu.hr

Robert ZENZEROVIĆ, Ph.D.
Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković"

E-mail: robert.zenzerovic@unipu.hr

Abstract

It is considered that intangible resources are one of the critical factors of value creation in a knowledge-based economy. Intellectual capital is considered one of a company's most important intangible resources and, therefore, essential for achieving the desired level of financial performance. The relationship between intellectual capital and financial performance has been an intensive research focus for 30 years. Most of the research indicates that positive relationship dominates. This research contributes to the ongoing debate about the relationship between intellectual capital and financial performance by focusing on the population of non-financial companies doing business in Croatia. In this research, intellectual capital was evaluated using intellectual capital efficiency as a part of the MVAIC model, while various financial performance indicators were considered dependent variables. This research mainly aims to test the cor-

relation between intellectual capital efficiency and financial performance and whether intellectual capital efficiency affects financial performance. Research has been conducted using aggregated financial data for Croatian companies from 2002 to 2020. The results have shown a positive, moderate, and significant correlation between the two variables. Additionally, it has been shown that intellectual capital positively and significantly affects financial performance. According to research results, intellectual capital should be in focus for companies in Croatia since it contributes to financial performance.

Keywords: *Intellectual capital, Intellectual capital efficiency, accounting ratios, Croatia, Financial performance*

JEL Classification: *M41, M21*

1. INTRODUCTION

For most private sector companies, profit maximization is one of the leading goals. The combination of tangible and intangible resources is crucial for achieving that goal. While focusing on profit maximization, it is important to consider intellectual capital, representing the company's intangible resources. Intellectual capital includes human, structural, and relational capital. Human capital mainly refers to employees' collective knowledge, skills, and competencies, while structural capital stands for infrastructural support for human capital, which remains in the company when employees leave. The last and the most contemporary component of intellectual capital is relational capital which includes relationships and knowledge exchange within the company but also between the company and its surrounding, mostly its customers. As such, intellectual capital can represent a valuable source of competitiveness and contribute to a company's financial performance.

Considering the importance and benefits of intellectual capital, the main objectives of this study are to determine the correlation between intellectual capital and financial performance and to consider if intellectual capital affects financial performance. The authors will also try to determine the direction and intensity of these effects.

This research contributes to the existing quantum of knowledge by contributing to the ongoing debate about the relationship between intellectual capital and financial performance by focusing on aggregate data of Croatian companies

analyzing 19 years. Specifically, it has shown a moderate positive correlation between intellectual capital efficiency and financial performance and that intellectual capital efficiency positively affects financial performance.

The remainder of the paper is organized as follows. The theoretical background and literature review on intellectual capital and its relationship with financial performance are initially summarized. A description of intellectual capital valuation is elaborated in a separate section. The authors defined research hypotheses based on the theoretical background, literature review, and significance of intellectual capital as a critical success factor. The research methodology and results and the discussion and conclusion section are presented at the end of the paper.

1.1. Theoretical background and literature review

According to the resource-based view, a company's resources are the primary driver of competitiveness and firm performance (Riahi-Belkaoui, 2003: 216). Barney (1991) claimed that a company's resources must be valuable, rare, and difficult to mitigate and substitute to achieve sustained competitive advantage. In line with resource-based theory, the company's internal characteristics, like developing different resources and capabilities, are essential in adapting to a competitive environment and improving survival (Esteve-Pérez & Mañez-Castillejo, 2008). These resources could be tangible or intangible. Caves (1980: 64) claims that a company "holds tangible and intangible semi-fixed assets or skills," based on which it chooses a corporate strategy and defines an organizational structure that influences its economic performance. Although the importance of tangible resources has traditionally been emphasized in most literature, a trend toward exploring the importance of intangible and invisible resources is becoming more evident. Moreover, some studies show that, nowadays, the value of companies is mainly generated by intangible assets (Volkov & Garanina, 2007).

According to Itami and Roehl (1991: 12), invisible resources, such as consumer trust, brand image, management skills, or corporate culture, are the "most important source for long-term success" since such resources are considered a source of competitive power and corporate adaptability. Ordonez de Pablos (2003) also emphasized the importance of strategic intangible assets for achieving a sustainable competitive advantage for a company.

Although it has been at the center of much research for more than three decades, the interest in intellectual capital still exists, especially in the context of value creation and the success of business entities. There is still no unique definition, although trends point out the definition of intellectual capital through its components. The fact is that efforts are directed to intellectual capital valuation to highlight its value for the company and its impact on business performance. In line with this, Stewarts (1997) states that intellectual capital includes knowledge, experience, information, and intellectual property that could be used to create wealth. Dumay (2016) suggested that the word wealth should be replaced with value, indicating that intellectual capital contributes to company value creation. However, the intellectual capital value is partially hidden, and its impact has to be proven and elaborated.

The definition of intellectual capital should clarify what is being said when it is mentioned and its components. On the other side, those components are interrelated and influence each other and total business performance, meaning that intellectual capital is not a static category. That is why we lean toward the dynamic approach in definition, saying that intellectual capital is considered a result of using interlaced intellectual, human capital, and organizational resources of a business entity and that, as such, it cannot stand alone or be evaluated separately, from other assets (Choong, 2008).

Most authors in relevant literature adhere to intellectual capital classification into three components - human, structural, and relational capital. Sometimes different terms are used for each, but the definitions are similar.

Human capital is mainly described as the driver of intellectual capital and includes an entire range of individual and collective knowledge, abilities, attitudes, possibilities, behavior, experience, and emotions of employees. This also includes the accumulated value of investments in the education and expertise of employees and management and their ability to turn their knowledge, skills, and experience, which are precisely the result of mentioned investments, into active creation of value added for the business entity (Sundać & Švast, 2009). It is vital to point out that employees are not human capital by themselves and that they become human capital only when they turn their knowledge and abilities into actions that are aligned with the business strategy and contribute to the creation of tangible or intangible value for the company (Intellectual Capital Management Manual in companies, 2004). In other words, employees pre-

cisely create intellectual capital with their competencies, attitudes, and dexterity (Engström, Westnes & Westnes, 2003; Roos, Pike & Fernström, 2005).

Structural capital represents the infrastructural support of human capital. It is often described as a set of factors that significantly contribute to the business entity, which remain in the business entity after the employees leave. Bontis (1998) considers structural capital as all mechanisms and structures that help and enable employees to develop better and distribute their cognitive resources and thus improve the performance of a business entity. According to Stewart (Joia, 2007), structural capital refers to technology, manuals, processes and their descriptions, and networks that allow knowledge and competence to be stored so that they remain after employees leave their jobs. Examples are patents, licenses, manuals, databases, culture, useful ideas, ways of doing work, systems, processes, etc. Consequently, structural capital can be viewed as the company's entire material and immaterial infrastructure that enables it to carry out business processes.

Relational capital is usually described as relationships and knowledge exchange between entities within the business entity, but also by relationships and knowledge exchange between the company and entities from its external environment. According to the literature, it is often equated with consumer capital. However, as it is generally defined more broadly than exclusive relations with consumers, we consider the term relational more acceptable. When defining relational capital, more things can be included, such as interest groups from the external environment referring to consumers, distributors, suppliers, partners, and other stakeholders. The current value of the mentioned relationships and connections represents relational capital. It also refers to their potential future values and the knowledge that enables creating and maintaining the mentioned relationships. Although relational capital is not owned or controlled by the business entity, it significantly influences the relationships described above.

Intellectual capital is often considered an essential driver of companies' competitiveness and value creation, especially in a knowledge-based economy (Xu & Liu, 2020). Therefore, intellectual capital could be considered an essential resource for a company that leads to better financial performance. The relationship between intellectual capital and a company's performance has been widely explored across countries and industry sectors (Bayraktaroglu et al., 2019). Different measures have been implemented to provide conclusions about these relationships, but also different results have been reported.

Clarke et al. (2011) explored the effects of intellectual capital on a company's performance in a sample of Australian companies, and their research results supported this relationship. The positive result of intellectual capital on firm performance for Australian companies has also been reported by Nadeem et al. (2018).

Nimtrakoon (2015) found that intellectual capital positively affects both the market value and financial performance of companies from ASEAN countries. The positive effect of intellectual capital on Taiwanese companies' market value and financial performance was confirmed by Chen et al. (2005). On the other hand, Hamdan (2018) explored the effects of intellectual capital on performance. He found that results differ depending on which measure of performance (accounting-based or market-based) and also which country is considered. More precisely, he found that intellectual capital has a positive effect on accounting-based performance, but he did not find a relationship with market-based performance.

Using a new model for intellectual capital measurement, Sydler et al. (2013) have shown that expenses of creating intellectual capital generate intellectual capital assets in the next year. That increase in intellectual capital is related to higher levels of ROA.

As for Croatian publicly listed companies, Pavic Kramaric et al. (2021) investigated the relationship between intellectual capital and its components on financial performance. They have found the positive effect of intellectual capital on accounting and market-based performance measures. In contrast, results on the relationship between intellectual capital components and performance are mixed (positive or non-significant).

1.2. Intellectual capital valuation

During the last 30 years, many intellectual capital valuation, management, and reporting models have been developed. They differ in terms of criteria, level of application, and even the intentions of their authors.

Intellectual capital valuation methods and models are usually classified in the literature into four groups: direct methods of intellectual capital valuation, market capitalization methods, return on invested assets methods, and scorecard methods.

While some methods are very concrete and objective, others are subjective and based on estimation. The first ones do not include intellectual capital's soft, invisible, and even not measurable nature. In contrast, the others include it but cannot be calculated from financial statements data.

Considering the availability of data, the simplicity of calculations, the wide acceptance of the model, and its compliance with the research objectives, the authors have chosen to apply variable intellectual capital efficiency, a part of the Modified Value Added Intellectual Coefficient (MVAIC). MVAIC measures business efficiency and is often used to measure intellectual capital efficiency. The model calculation is presented in Equation 1.

$$MVAIC = CEE + ICE \quad (1)$$

CEE represents capital employed efficiency and is calculated as follows:

$$CEE = VA/CE \quad (2)$$

VA is value-added and represents the difference between operating revenues and goods and services bought from entities outside the organization. CE is capital employed, i.e., shareholders' equity. ICE represents intellectual capital efficiency and is calculated in the following way:

$$ICE = HCE + SCE + RCE \quad (3)$$

HCE is human capital efficiency and represents the relation between value-added and human capital (VA/HC), where human capital represents the total costs of employees. SCE is structural capital efficiency and shows the relation between structural capital and value-added, whereas structural capital represents the difference between value-added and human capital. The last element of intellectual capital efficiency is relational capital efficiency (RCE) which is calculated as a relation between relational capital and value-added (RC/VA), where relational capital is presented by the marketing costs of an organization (Zenzerović & Černe, 2021: 450).

The original Value Added Intellectual Coefficient (VAIC) model for measuring business efficiency equally values two elements: used (physical and financial) capital and intellectual capital. These are two essential resources that contribute to the creation of added value as a measure of business success. Institutions' capital represents used capital, while intellectual capital comprises human and structural capital. During this period, some authors have additionally corrected and supplemented this model. Bontis et al. (2007) divided

structural capital into three elements: customer capital, innovation capital, and process capital. Vishnu and Kumar Gupta (2014) included relational capital in the model, measured structural capital by investments in research and development, and replaced value added with operating income. Nadeem et al. (2017) corrected the original VAIC model by valuing structural capital through research and development costs and investments in copyright protection. They included such valued structural capital in the calculation of added value. Nimtrakoon and Chase (2015) extended the model with a third missing variable, relational capital, and decided to measure it with marketing costs.

Because it is one of the first models of intellectual capital valuation that could be easily calculated using data from available financial statements and enables comparability, the MVAIC model is the subject of continuous scientific discussions. Scientific critiques are directed toward the components of intellectual capital. Stahle et al. (2011) believe that the model shows the efficiency of work and investment and does not meet all the conditions that could classify it as a measure of intellectual capital efficiency. They also criticize the measure of added value, stating that it is generally influenced by business decisions made by management. Another criticism is that human capital efficiency could increase from the companies' investments in their employees, expecting increased value added. However, the reverse situation, where companies increase human capital efficiency by reducing employee investment, increases the short-term coefficient. Authors are aware that intellectual capital components consist of elements that are not part of financial statements, usually not even of non-financial statements, and that the great value of intellectual capital is derived from such subcomponents, but methods that they are using in this paper are one of the most applicable according to available data which are easily measurable and comparable.

2. RESULTS

2.1. Research hypotheses

According to previously elaborated theory and literature review, it is evident that intellectual capital and financial performance are related and that intellectual capital could contribute to improving financial performance. Additionally, previous research results suggest that the positive relationship between

intellectual capital and performance dominates. Hamdan (2018) has pointed out that the effects of intellectual capital on performance differ depending on which measure of performance is used (accounting-based or market-based) and also which country is considered. The authors decided to test this relationship among the Croatian companies in the long term using the accounting-based measure.

Considering all mentioned, the following research hypotheses are defined:

Hypothesis 1: *There is a positive correlation between intellectual capital efficiency and financial performance.*

Hypothesis 2: *Intellectual capital efficiency has a positive effect on financial performance.*

2.2. Research methodology

For purposes of this research, data for Croatian non-financial companies have been collected between 2002 and 2020 (19 years). The data were collected from the Financial agency, a government-owned institution in charge of collecting and publishing financial data of companies. They represented the data available when the research was performed. Obtained data have been consolidated on the state level (level of all companies that submitted financial data), and all variables were calculated every year. According to the sectorial classification of institutional units, the non-financial sector includes institutional units whose distribution and financial transactions differ from those of their owners, which are market producers, and whose main activity is the production of goods and non-financial services (Eurostat).

In order to test the first defined hypotheses, the correlation between considered variables has been analyzed. Additionally, the company's size is considered the control variable. For purposes of testing the second defined hypothesis, the following regression model has been evaluated:

$$FP_t = b_0 + b_1 ICE_t + b_2 SIZE_t \quad (4)$$

where abbreviations are described below
FP – financial performance
b_0 – constant in the model
b_1, b_2 – regression coefficient

ICE – intellectual capital efficiency

SIZE – the average size of the company measured by the logarithm of average total assets

The research model has been tested using multiple linear regression analysis. To test the above-presented model, variables for intellectual capital, financial performance, and company size are required. The intellectual capital has been measured using variable efficiency from a modified version of VAIC developed by Nimtrakoon and Chase (2015). The intellectual capital efficiency was measured using the formula from equation 3. Financial performance was measured with ROA (return on assets) as a ratio between net income and total assets. Companies' size was measured as a logarithm of the average value of total assets, typically used in literature (Nimtrakoon, 2015; Sardo & Serrasqueiro, 2017; Sardo et al., 2018).

2.3. Research results

Descriptive statistics of variables used in the research are presented in Table 1. Since all variables have been calculated annually, there are 19 observations, one per year. The value of intellectual capital efficiency ranges from 2,06 to 2,33, with a mean value of 2,16 and a low level of variation. The value of financial performance (ROA) is positive, which indicates that, on average, Croatian companies included in the research are profitable in all years. The lowest value of ROA is 0.0221, reported for the year 2013, while the highest is 0.04, reported in 2008. The mean value of ROA is 0.03, and its coefficient of variation of 18.43.

Table 1: Descriptive statistics of data

Variable	Number of observations	Mean	Std. dev.	Coefficient of variation	Min	Max
ICE	19	2.1644	0.0769	3.55%	2.0570	2.3386
FP (ROA)	19	0.0293	0.0054	18.43%	0.0221	0.0385
SIZE	19	27.5689	0.1949	0.71%	27.0839	27.80

Source: Authors' calculation

The correlation matrix between variables used in this research is presented in Table 2, and data from it are used to test Hypothesis 1. It can be seen that there is a significant positive correlation between financial performance and intellectual capital efficiency, meaning that the increase in intellectual capital efficiency

is related to the increase in financial performance measured with ROA. Considering the strength of this correlation, it is evident that it represents a moderate positive correlation. According to the correlation matrix data presented in Table 2, it can be concluded that hypothesis 1 (There is a positive correlation between intellectual capital efficiency and financial performance) can be accepted.

Table 2: Correlations matrix of data

Variable	ICE	FP (ROA)	SIZE
ICE	1		
FP (ROA)	0.4955	1	
SIZE	0.5766	-0.0832	1

Source: Authors' calculation

Before testing the time series regression model, data were tested for stationarity and autocorrelation using the Augmented Dickey-Fuller and Durbin-Watson tests. For the tested model, the Augmented Dickey-Fuller test has shown that data are stationary, while the Durbin-Watson test indicated no autocorrelation. Table 3 presents the results of the Durbin-Watson test. Since dU < d < 4 - dU (1.416 < 1.803 < (4-1.416)), there is probably no evidence of positive or negative autocorrelation (Gujarati, 2011).

Table 3: Durbin Watson test

Durbin Watson d –statistics (3, 19)	1,803119
Critical values:	
d_L (3.19)	0.742
d_U (3.19)	1.416

Source: Authors' calculation

The regression results of the tested model are presented in Table 4. As can be seen from the table, the estimated model is statistically significant at a 99% level, and it has explanatory power. According to the R2 value, 45% of the variation in ROA is explained by independent variables (intellectual capital and size). Intellectual capital efficiency significantly impacts financial performance (ROA), and an increase in intellectual efficiency of one-unit results in an increase of ROA for 0.06 units. The effects of size are negative and statistically significant. Based on the presented results, hypothesis 2 (Intellectual capital efficiency has a positive effect on financial performance) can be accepted as well.

Table 4: Regression results for the relationship between intellectual capital and financial performance

	Coefficient	Stan. Err.	t	P >	t		95% confidence interval
ICE	0.0573	0.0160	3.59	0.002	0.0234
Size	-0.0153	0.0063	-2.43	0.027	-0.0287
constant	0.3282	0.1564	2.10	0.052	-0.0033
Number of observations: 19 F (2.16) = 6.53 Prob > F = 0.0085 R² = 0.4493 Adj R² = 0.3805					

Source: Authors' calculation

3. DISCUSSION

In profit maximization, using limited resources as much as possible is crucial. Such resources can be divided into tangible and intangible ones. Although tangible resources are required and essential, nowadays, the shift in the importance of intangible resources is evident. In line with this, Kamasak (2017) found that intangible resources and capabilities contribute more significantly to a company's performance than tangible resources. Similarly, Galbreath and Galvin's (2006) study showed that intangible resources are essential in explaining a company's performance variations. Intangible resources are essential for a company's performance. Intangible resources, among others, include intellectual capital, which is the focus of this study. Intellectual capital includes human, structural, and relation capital, which can be an essential driver of a company's performance, especially in a knowledge-based economy (Sardo & Serrasqueiro, 2017). Due to that, the relationship between intellectual capital and performance (especially financial one) has been the focus of many scientists. However, in order to be able to assess this relationship, it is crucial to evaluate intellectual capital. In literature, different models of intellectual capital can be found. For this research, the authors have decided to use the intellectual capital efficiency that is part of the MVAIC model.

Considering the importance of intellectual capital for a company's performance, the main aim of this study was to determine if there is any correlation between intellectual capital efficiency and financial performance and whether

intellectual capital efficiency contributes to a company's financial performance. For this analysis, data from financial statements of Croatian non-financial companies from 2002 to 2020 have been used. The defined hypotheses have been tested using correlation matrix analysis and regression analysis. The results have shown a moderate correlation between intellectual capital efficiency and financial performance and that intellectual capital efficiency positively affects financial performance. Based on these results, it can be concluded that intellectual capital is an essential driver of financial performance. Therefore, every investment into employee knowledge, creativity or motivation, relationships with customers and suppliers and other stakeholders, organizational infrastructure, and technology results in improved intellectual capital, financial performance, and business excellence.

This study's results align with previously reported results in the literature since most previous studies reported a positive relationship between intellectual capital and financial performance. Therefore, this study contributes to the ongoing debate about the relationship by confirming the positive results of a sample of Croatian companies. Apart from confirming the positive correlation between intellectual capital and financial performance and the positive effects of intellectual capital on financial performance, the contribution of this paper is in the sample used. Namely, most studies analyzed this relationship for companies operating in the biggest and most developed countries. However, what about a small, developing country like Croatia? Due to its historical features related to communism, where the care of employees was of high priority, as well as 30 years of market economy experience, Croatia makes an attractive area for this research. Considering the importance of intellectual capital for financial performance, Croatian companies exhibit similar results as companies from the world's biggest and most developed countries.

Several implications of this study can be identified. First of all, the results of this study should be of interest to regulators and government institutions since they have the power to stimulate the development of intellectual capital through education, tax benefits for investments leading to improvement of intellectual capital, financing project and programs for intellectual capital improvement, etc. Secondly, results could interest companies since it has been proven that intellectual capital results in increased financial performance, i.e., contribute to profit maximization. By investing in components of intellectual capital in the long run, companies could improve both profits and their business excellence and social responsibility.

The main limitation of this research is related to data. Intellectual capital efficiency and financial performance calculation data represent annual average values for Croatian companies. Another limitation is related to intellectual capital efficiency measurement. Namely, we used intellectual capital efficiency as a segment of the MVAIC model because it is simple to calculate, but its' main limitation is an inability to include all segments of intellectual capital efficiency, considering that they could not be precisely measured using the accounting data.

The results of this study also open some new possibilities for research. Considering the structure of intellectual capital (human, relational, and structural), it would be interesting to analyze whether all three components contribute to profit maximization and to which extent. In such a way, the most critical intellectual component could be identified. Additionally, this research was based on the entire Croatian economic sector except for the financial industry. However, considering different levels of knowledge intensity across different industry sectors, it would also be interesting to identify in which industry sectors intellectual capital is the most significant contribution to financial performance. This analysis could be improved using the extended time series with new data as they become available. It could also be extended in the future, using the nonconsolidated data on the sample of selected companies.

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THE RISK MANAGEMENT PRESENTED IN THE FINANCIAL STATEMENTS OF ROMANIAN ENERGY COMPANIES

Georgiana Ioana ȚÎRCOVNICU, Ph.D.
West University of Timisoara/Accounting Department

E-mail: georgiana.tircovnicu96@e-uvt.ro

Camelia-Daniela HAȚEGAN, Ph.D.
West University of Timisoara/Accounting Department

E-mail: camelia.hategan@e-uvt.ro

Abstract

Identifying a risk within an information system represents the possibility of losses that can negatively affect information resources and how an organization's system operates. The risk minimization process is directly proportional to the loss minimization (financial and technical losses). The success of an organization lies primarily in how the identified possible risks are addressed and managed. Every business should assume risk has a strategic basis for developing a risk management program. The relationship between a company's growth direction and risk management system is reflected in the idea that they complement each other. When an organization's financial position is evaluated, an analysis of resources is carried out, thus prioritizing various strategies to manage possible risks. The primary purpose of this paper is to analyze the structure and disclosure of risk management practices within the financial statements of a chosen sample of energy companies listed on the Bucharest Stock Exchange. The study focuses on the identified non-financial performance indicators from 2020 to 2021. Based on the manually collected data, the information presented in the companies' financial statements has been analyzed to determine the level of transparency regarding the risk management activities. The results showed us that each company decided to present the risk management process in different variations, indicating a greater openness to accepting and implementing new trends aimed at favoring the positive development of

companies. Because of the study's limitations, future research should consider expanding the sample to include energy businesses operating across continents. Every organization faces daily confrontations with risks from different fields of external or internal nature, such as operational, financial, human resources, quality, and environmental risks.

Keywords: *risk, management, financial statements, energy, performance*

JEL Classification: *M40; M16*

1. INTRODUCTION

The concept of risk seems to be used daily, but things have not always been the same. This concept was introduced to the economic field in the 1980s when banks started applying different principles regarding credit and market risks (Damayanti, 2023: 1115-1122). Although project management is the most effective approach to managing opportunities, accepting risks has always been crucial. It must be actively controlled by those who work in the program and risk management departments. Risk management generally outlines how to manage risk; nevertheless, it does not solely focus on risk avoidance.

Additionally, it necessitates strategic planning to manage risks that must be taken. In other words, depending on the context and plan, it also involves acknowledging, evaluating, and monitoring risks. The risk management process aims to evaluate the risk-reward ratio so that the best opportunities can be given priority.

Over the years, the challenges that companies have encountered have shown the need to implement a model in which the responsibilities regarding risk management are clearly defined and properly implemented (Malik et al., 2020: 100178). The risk management process aims to identify external and internal factors that can prevent the organization from developing ethically and legally but also to form a plan so that the impact of risks on the company is not significant (Bakos & Dumitras, 2022: 165). The risks that can affect a company's financial statements can also arise from its internal environment, not only from the external environment. There have been many situations in which the damage to the company was brought even by the organization's management, which is supposed to have in mind, first and foremost, the development of the company's performance (Sudaryono et al., 2022: 179-204).

This article aims to analyze the quality of transparency of the risk management activities regarding a sample of companies listed on the Bucharest Stock Exchange (BVB) concerning several performance indicators. This research is based on the information presented in the annual reports for 2020-2021. At the time of the study, the results for 2022 have yet to be fully published. According to the research methodology, the literature review of this article represents the first step in understanding the importance of presenting the risk management process in the financial statements and the influence on the quality of reporting, therefore justifying the second part of this research. Following the analysis, the common points and differences were discussed regarding the enterprise risk management reporting process of the Romanian energy companies listed on BVB.

2. THE EVOLUTION OF RISK MANAGEMENT AND THE IMPLICATIONS ON FINANCIAL STATEMENTS

2.1. Literature review

The enterprise risk management (ERM) process involves identifying risks, evaluating them, and eventually developing a plan to combat or at least keep them under control and their potential impact on the organization. The process of ERM should be seen as a positive action for the company and not as a constraint. Using a suitable implementation of this process following the regulations in force and with the characteristics of the companies allows organizations to present their financial statements as reliably and transparently as possible. This aspect is essential in creating a good perspective of the organization in front of third parties or potential investors (Kopia et al., 2017: 37).

No organization can avoid risk altogether, and the consequences of risk do not necessarily have to be negative. However, each company should weigh potential risks and opportunities and determine acceptable risks. This information holds value for the decision-making process, as it is crucial for businesses to be aware of the risks associated with their daily operations and to implement necessary measures to manage them effectively. The underlying premise is that the business possesses the most comprehensive understanding of appropriately handling risks. The organization should be balanced based on a solid ethical

culture so that the decisions made at the managerial level are based on a solid management risk approach.

The risk management procedure typically consists of five steps. However, these processes can vary greatly depending on the situation (Tofan et al., 2011: 7-9). Identifying the primary goals of the business is the first stage. It frequently has to do with the company's or person's tolerance for risk. How much risk is the business willing to take to accomplish its objectives? Finding and defining possible threats is the second step. It seeks to expose any circumstance that may have detrimental repercussions. This stage can also reveal relevant information not immediately related to potential financial risks in the corporate environment.

Once risks have been identified, the subsequent step involves evaluating their anticipated frequency and severity. This enables the risks to be prioritized, facilitating the development or adoption of suitable responses. The fourth phase entails defining responses for each risk category based on their significance level, establishing the actions to be taken in the event of an unfortunate occurrence. The final stage of a risk management strategy entails monitoring its effectiveness in addressing events, often necessitating continuous data collection and analysis (Nastase et al., 2011: 62-73).

Within financial markets, there is a widespread consensus that implementing an effective risk management strategy significantly enhances one's chances of success. In practical terms, this could involve relatively straightforward actions such as establishing stop-loss or take-profit orders. The category of financial risks that can affect a company can include a multitude of risks; some are more general than others, depending on the company's object of activity. One of the extensively examined financial risks in the risk management process is market risk, which can be minimized by implementing stop-loss orders for each transaction. This ensures that positions are automatically closed prior to incurring significant losses. Mitigating liquidation risk can be achieved by engaging in trading activities within high-volume markets, as assets with a larger market capitalization generally exhibit greater liquidity.

Trading on a reputable market can reduce credit risk by eliminating the need for borrowers and lenders (or buyers and sellers) to rely solely on mutual trust (Peterdy, 2023). In terms of operational risk, investors can mitigate it by diversifying their portfolios and minimizing exposure to a single project or company. Furthermore, conducting thorough research aids in identifying organizations

that are less susceptible to operational failures. Other risks that could impact the company's performance include those related to the terms of the financing agreements, the risk of a decline in credit rating, and pricing risk due to the volatile nature of the market. Regardless of the nature of the risks, whether strategic or operational, it is essential to consider each company's industry and field of activity so that the identified risks are consistent.

Every day, the energy industry is subject to changes, and the importance of the sector and interest in it are becoming increasingly important today. The impact of the energy sector has reached such a high level that we can see it as a fundamental aspect of our lives. If this sector can be stabilized, the population's economic growth, health, and well-being will not be affected (Sidorova et al., 2022: 1-15). Lately, global events have impacted many markets, including the energy and gas market worldwide. The negative impact is manifested by price increases, the bankruptcy of energy or gas organizations, and the inability of some countries, social classes, or people in disadvantaged areas to access these types of services.

Nevertheless, these aspects have created the opportunity for extensive research in this field and the freedom of development for small and medium-sized energy and gas companies to grow and develop in a competitive market. In the last 2-3 years, new gas or energy supply lines have been developed and continue to grow, which means that the risk management process for such companies will be increasingly considered in business decisions. Energy companies have had issues for a long time in implementing a good enterprise risk management process due to a variety of factors, such as the inability to disperse responsibilities, the lack of resources or a clear definition of the organization's objectives, and inadequate infrastructure (Pecina et al., 2022: 15).

The need for transparent reporting of the risk management process is increasing, and energy companies face difficulties implementing a robust system following the current regulations. Standardized risk management reporting leads to more qualitative and credible information sharing, increasing the company's value. Considering the current context, namely that the Romanian market has transitioned from a frontier market to an emerging one, it is important to observe the evolution of companies from the perspective of reporting and risk assessment. Therefore, we find our research very relevant in establishing where Romanian energy companies stand in terms of the implementation and accuracy of the reporting of the risk management process.

2.2. Research methodology

According to the research methodology, this article is designed in two parts. The first part represents a scientific exploration of existing information to create the foundations for the second part of the present paper. The information presented in the companies' financial statements has been analyzed based on manually collected data to determine the level of transparency regarding risk management activities. According to Directive 2014, companies must include various non-financial indicators in their financial statements. These indicators encompass environmental factors, risks, key performance indicators (KPIs), social and employee-related matters, gas emissions, human rights, corruption, and more (Hategan et al., 2018: 272-277).

Given the nature of this case study, we deemed it appropriate to select a sample of ten Romanian energy and oil companies publicly listed on the Bucharest Stock Exchange (BVB) for the years 2020 and 2021. It should be noted that the complete results for 2022 were not yet available at the time of the study. The companies included in the BVB listing are as follows: OMV Petrom, Energetica Electrica S.A., Rompetrol Rafinare S.A., Oil Terminal S.A., Transelectrica, Conpet S.A., Romgaz S.A., S.N. Nuclearelectrica S.A., Transgaz S.A., and Rompetrol Well Services S.A. We identified the general activities regarding the risk management process for these companies and analyzed them and their impact on reporting transparency.

At the same time, the ten companies' most evaluated and reported financial risks were classified and detailed to analyze their impact on the financial results and to see how vital the reporting and assessment transparency of the risk management process is for a company.

2.3. Results

Given the limited sample size and the industry context in which the companies operate, it is important to highlight these companies' presentation and overall analysis, as well as the key indicators that could impact risk assessment, reporting, and, ultimately, risk management process. The analysis and critical indicators are presented in Table 1.

Table 1. A comprehensive outlook on Energy and gas companies in Romania

Nr. Crt.	Company Name	Industry sector	Turnover		Profit / Loss		Number of Employees	
			2020	2021	2020	2021	2020	2021
1	Omv Petrom	Extraction of crude oil	14,795,525	23,586,087	1,503,899	3,107,193	10949	8271
2	Romgaz	Extraction of natural gas	3,926,033	5,725,213	1,278,884	1,962,509	5531	5340
3	Energetica Electrica	Electricity production and distribution	3,583	285	298,378	321,819	107	104
4	Conpet	Supply of domestic and imported crude oil	406,928	412,786	60,846	51,928	1511	1540
5	Transelectrica	Electricity transport	2,326,822	3,702,629	144,956	449	2021	2015
6	Nuclearelectrica	Production of electricity, heat and nuclear fuel.	2,448,712	3,118,375	699,322	1,036,261	2028	2002
7	Oil terminal	Handling of crude oil, petroleum products	191,556	212,323	3,705	5,752	944	947
8	Transgaz	Natural gas transport	1,474,078	1,683,775	175,000	186,941	4153	4097
9	Rompetrol Rafinare	Manufacture of products obtained from crude oil processing	8,275,110	12,149,617	-645,823	-450,988	1097	1061
10	Rompetrol Well Services	Service activities associated with the extraction of crude oil and natural gas	47,622	44,230	4,362	1,629	146	151

Source: personal computation based on annual financial reports released by the companies on the Bucharest Stock Exchange website during 2020-2021. (Turnover and net profit are expressed in thousands of RON.)

Based on the indicators outlined in Table 1, companies' risk management processes can be positively or negatively influenced. The link between these indicators and risk management lies in the company's capacity to allocate financial or human resources toward enhancing the risk management process. Essentially, the company's ability to invest in developing the risk management process is directly proportional to the availability of adequate financial resources.

Upon observation, it becomes apparent that despite operating within the energy or oil sector, there is a significant variance in the number of employees among the companies, indicating a notable discrepancy in terms of human resources. Among the companies assessed, OMV Petrom has the highest average number of employees over the two years, totaling 9,610 individuals. Conversely, Rompetrol Well Services faces a considerable staff shortage, with an average of 148 employees. Simultaneously, when examining the turnover figures of the companies, it is evident that OMV stands out significantly compared to the other companies. In 2021, OMV recorded a turnover of 23.58 billion Romanian Leu (RON), showcasing substantial financial performance. On the contrary, Energetica Electrica represents the opposite end of the spectrum, with a turnover of merely 285 thousand in 2021, indicating comparatively modest financial results.

The only company that experienced a loss over two years is Rompetrol Rafinare. By the end of 2021, the company reported a loss of 450 million Romanian Leu (RON). All the remaining companies reported profits, with OMV Petrom, recognized as the largest oil production and extraction company, achieving the highest profit. After 2021, OMV Petrom recorded a 3.11 billion Romanian Leu (RON) profit. This information holds significance in understanding why a company may have assessed and reported a higher or lower number of risks it encounters.

Given the absence of a clearly defined standardized model for reporting and assessing risk management processes, each company has independently evaluated and reported its risks based on its unique characteristics. However, there were also common elements followed by the companies outlined in Table 2.

Table 2. Risk management-related activities

Governance of the risk management process	Policies and Legislative Framework	Risk assessment
- At every company level, risk prevention is included in the everyday decision-making processes. - The board establishes, communicates, and ensures implementation of the organization's risk management approach and objectives.	- one role of company management is to ensure that, at the company level, an effective risk management system is implemented. - Establishing the unitary general framework for risk identification, analysis and management. - Providing a tool for risk management in a controlled and efficient way. - Describing how the control measures designed to prevent adverse risks are established and implemented.	All processes are hidden under the internal control of the system. To encourage the use of internal control systems, substantial or critical risks associated with particular activities are identified. - Companies consider risks based on the short, medium and long-time horizon - Risks are categorized into the following groups: operational and strategic risks, market and financial risks, and climatic hazards.
Control environment	Information and communication	The framework of the internal control system
- An efficient internal control system is built on the presence of a controlled environment. - In this sense, several policies have been developed regarding zero tolerance for corruption, anti-fraud and anti-money laundering, avoiding and combating conflicts of interest, policies regarding gifts, protocol expenses and the prohibition of facilitation payments, transparency and the involvement of interested parties), as well as organizational measures (authority and responsibility delegation).	- Internally, information supports all other control system components by informing employees of their roles in information control and provision appropriately and promptly, enabling each employee to do their obligations. - The production of internal communication results from the transmission of information to all levels, and the dissemination of information to external parties, following requirements and expectations, which is known as external communication;	- Implementing an internal control system, which includes measures to stop or identify undesirable occurrences and hazards. Such risks include fraud, errors, damages, non-compliance, unauthorized transactions, and distortions in financial reporting. - Assessment of process risks and compliance

Source: personal representation based on annual financial reports published by the companies on the Bucharest Stock Exchange site in 2020-2021

Each company has defined how it governs the risk management process, considering the organization's decision-making process and its objectives. In order to avoid any potential adverse effects on operations and reputation, the risk management process is based on a preventive and methodical strategy, aiming at early detection and control of risks. Legislative risk is represented by potential changes to the legal system that could be directly applicable, without requiring national legislation to be transposed, in Romania and/or from the European Union.

Possible modifications include the implementation of additional levies or establishing standards and/or requirements for nuclear security set forth by the local community, national government, and/or the body in charge of nuclear energy regulation. The legislative risk may increase production costs more than expected, reducing profit margins.

The internal control systems of companies encompass activities aimed at preventing or detecting undesired events and risks, including fraud, errors, damages, non-compliance, unauthorized transactions, and distortions in financial reporting. All ten companies presented each stage of the internal control environment, how it was implemented, and its impact on the entire process.

By informing employees of their control obligations and delivering appropriate information on time for all employees to use, information supports all other system components of internal control. Internal communication occurs when information is distributed to all levels, and external communication refers to the distribution of information to outside parties following specific needs and expectations. The main advantages of the risk management process are improvement in the performance of the company through the identification, analysis, evaluation, and management of all the risks that might occur at its level to reduce the negative effects of negative risks or, as the case may be, to increase the positive effects of positive risks.

Apart from these, there were other specific topics presented by each company depending on the characteristics of the organization, such as aspects related to the internal audit process, risk insurance, monitoring activities, the implications of the code of ethics, aspects related to climate risks, etc. Risk assessment is one of the most important aspects evaluated and reported by all companies. Each organization selected its risks and evaluated them according to its considerations and specifications. Table 3 analyzes the risk assessment indicator and the corresponding achievement percentage for each company throughout 2020-2021. This information is crucial in understanding each company's progress and risk management's influence on organizational performance.

The percentages were derived by dividing the identified risks documented in each company's financial report by the total risks accumulated from all the analyzed financial statements.

Table 3. Analysis of Risk assessment indicators in the financial reports

Indicator	Omv Petrom		Romgaz		Energetica Electrica		Conpet		Transelectrica	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Risk assessment	46%	49%	22%	19%	11%	11%	32%	32%	49%	51%
Amounts			partially		x	x	x	x	x	x
Indicator	Nuclearelectrica		Oil terminal		Transgaz		Rompetrol Rafinare		Rompetrol Well Services	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Risk assessment	22%	27%	11%	11%	16%	16%	19%	19%	11%	11%
Amounts	partially		x	x	x	x	partially	partially		

Source: The information is derived from my calculations based on the financial reports published by the companies on the official website of the Bucharest Stock Exchange from 2020 to 2021. (The variable "X" represents the total value assigned to activities associated with the risk assessment process. If only some of the assigned values to the process were mentioned, they were indicated as "partially")

Regarding risk assessment and financial reporting, Transelectrica and OMV Petrom achieved the highest percentages, managing to report and analyze about half of the risks in all the analyzed reports. OMV Petrom analyzes both short- and medium-term and long-term risks, having an overview of the possible factors that may appear and negatively influence the organization's performance. Among the strategic risks, the company considers are climate change, increased global demand for oil and natural gas, and cyber threats. Comparing the 2020 annual report with 2021, the company introduced the risk of a pandemic caused by the COVID-19 virus into the risk analysis. The global COVID-19 pandemic has significantly influenced the progress of the global economy.

The rise in COVID-19 cases worldwide, attributed to the emergence of new virus variants, supply chain disruptions and high inflation, has resulted in delays in the anticipated demand recovery. OMV Petrom responded with specific measures to protect the company's economic stability and ensure the energy supply. The health and well-being of each employee were the top priority. If we consider the percentages of assessed and reported risks, we can observe a slight increase of 3%, which means that the company paid more attention to the risks that can influence the company's well-being. We can also attribute this aspect to the evolution of the pandemic.

The Transelectrica company was differentiated from the others by the many risks analyzed and by the fact that the financial reports included the amounts

invested in the risk management processes or estimated values representing the financial risks for the two years analyzed. From the perspective of receipts, payments were not delayed in 2020 or 2021; however, suppliers who experienced liquidity issues politely requested that more payments be made before the deadline. One risk the company examined was connected to safety, which considered the possibility of security and protection of essential infrastructures being compromised, as well as the insurance of business continuity in emergencies. This risk was not included in any other financial report.

The Conpet company is the third company in descending order that recorded a percentage of 32% in terms of risk assessment and reporting. From a percentage point of view, the company faced no significant changes, with the percentage remaining the same. However, the company analyzed a specific category of risks not found in the other annual reports. The company emphasized the assessment of risks related to some disputes arising from the defective way the legal regime of the lands crossed by main transport pipelines was regulated. For this reason, the company is currently engaged in a series of processes in which the owners of the respective lands request either the lifting of the transport pipelines or their relocation to other locations. Practically, we can say that the significant risk to which the company is exposed, as a concessionaire of the National Oil, Gasoline, Ethane, and Condensate Transport System, is the legal regime of the lands under/above the main transport pipelines established by the provisions of the Petroleum Law no. 238/2004.

Regarding the capital market risk analysis, the progressive evolution of the company can be observed between the two annual financial reports. If in 2020, the Romanian capital market was classified as a frontier market, at the end of the year, it acquired the status of an emerging market. In 2021, the company registered a positive evolution. The company conducted an interesting study regarding personnel risk, with the conclusion being unfavorable and unbalanced because the age categories with the largest share in society are those between 51-60 years. This means that in the long term, the risk is precisely represented by the lack of personnel due to the departure from the company of employees who reach retirement age.

Nuclearelectrica also recorded a slight positive increase in the number of assessed risks, with an increase of 5%. The company distinguishes itself based on the examination conducted on competitive risk, as it faces the potential rise of

regional competition driven by upcoming enhancements, renovations, expansions, and new constructions planned by producers in the respective electricity markets. Additionally, the company encounters volatility in renewable energy projects' production due to the uncertainty surrounding the availability of fuel sources like wind and solar energy. This factor significantly impacts another risk, specifically the risk related to investment, maintenance, and refurbishment activities. This risk is closely tied to the company's financial resources, the procurement and upkeep plan, the execution of essential studies and analyses to support the plans, the organization's internal structure and staff training, and the reliability of equipment and installation suppliers.

The companies Energetica Electrica, Oil Terminal, and Rompetrol Well Services recorded the lowest percentages regarding evaluating and reporting the risk management process. The percentage was 11% in both 2020 and 2021. All three companies evaluated the most well-known financial risks: credit, currency, interest rate, and cash flow. Regarding the risk management process, the reports from all three companies provide relatively concise information, primarily focusing on the risks mentioned above and aspects related to the objectives and regulations of the risk management process. None of the three companies includes the pandemic risk in their risk evaluations.

Furthermore, regarding risk management activities, Rompetrol Well Services is the only company not specifying any specific amount. On the other hand, being part of the same group, Rompetrol Rafinare evaluated and reported a higher number of risks in the financial statements, with a percentage of 19%. Unlike the other companies, this one emphasized the price risk of raw materials and petroleum products. The company faces the risk of fluctuations in crude oil prices, petroleum product prices, and refining margins. The company's operational activities require continuously purchasing crude oil for production and customer deliveries. Due to the significant increase in oil price volatility, the management developed a risk management policy which was presented to the company's Board of Directors and which was approved in its essential aspects.

Over two years, Transgaz recorded a 16% rate in terms of its risk management process analysis, with a particular focus on credit risk and capital risk management. In managing capital risk, the company strives to maintain its capacity to provide dividends to shareholders and benefits to other stakeholders while also seeking to maintain an optimal capital structure to minimize capi-

tal costs. The last company analyzed from the sample is the Romgaz company, which, as we can see in Table No. 3, is the only company for which the percentage of analyzed risks decreased from 22% in 2020 to 19% in 2021.

There can be many reasons why the company assessed fewer risks in 2021. This aspect does not necessarily have to be a negative one. However, we can consider that in 2021 the board of directors was restructured, and the company's general director was dismissed from his position. This situation could have an impact on the decrease of risk assessment. However, in this sense, much more research and analysis would be needed to establish the real reasons.

3. CONCLUSION

The risks of the analyzed companies were presented in this work to observe the trend in their evaluation and reporting, as well as to determine the ranking of Romanian energy companies in terms of risk management reporting. Due to variations in financial and human resources among the companies, the outcomes regarding financial evaluation and reporting also differ. Considering the case study results, we can conclude that the companies did not follow a specific reporting model for the risk management process.

Half the companies specified the amounts invested in the risk assessment or provided value estimates when analyzing financial risks. The other half of the companies either partially specified the amounts or did not. They described the activities without being able to observe the financial impact of the assessed risks. Transelectrica and OMV Petrom recorded the highest risk assessment and reporting percentages. At the opposite end, we find the three companies Energetica Electrica, Oil Terminal, and Rompetrol Well Services, which had the lowest percentages of analyzed risks, remaining at 11% throughout the two years.

Based on the reviewed reports, there is a noticeable trend in financial risk analysis. All companies have incorporated credit, liquidity, and currency exchange risks in their financial reporting. This indicates that companies are increasingly focused on the risk management process and are accurately reporting and evaluating these procedures. Among the sampled companies, Romgaz was the final one analyzed. Notably, it was the only company where the proportion of assessed risks decreased from 22% in 2020 to 19% in 2021.

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There could be multiple reasons for the company assessing fewer risks in 2021, and it does not necessarily indicate a negative outcome. However, it is worth considering that in the same year, the company underwent a restructuring of its board of directors, and the general director was dismissed. These events may have influenced the decrease in risk assessment. However, further research and analysis would be required to determine the underlying reasons for this change. Most companies have reported the impact of the COVID-19 pandemic at the organizational level, but only a few have included this risk in the category of the risk management process.

Considering the analysis, we realized that although all the companies have allocated one or more chapters to the risk management process in the financial statements, the lack of structure and pursuit of the same objectives can be observed. The presentation of activities regarding substance and values is disorganized due to a lack of systematic and standardized reporting. The comparative analysis of the significance of the enterprise risk management process information provided by the organization's annual reports shows how this study contributes to the literature. Due to the study's limitations, future research should consider expanding the sample to include energy businesses operating across continents.

Additionally, considering that the current research did not include 2022, we believe that analyzing the most recent year could provide significant insights for future research. Given the political situation resulting from the conflict in Ukraine, examining its effects on the development of energy and gas companies in Romania could provide a broader perspective.

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ESI FUNDS, INDUCEMENT FOR THE SOCIAL AND ECONOMIC DEVELOPMENT OF EU REGIONS: A LITERATURE MAPPING

Diana BALAN, Ph.D. Student
West University of Timisoara, Doctoral School of Economics and Business Administration

E-mail: diana.balan01@e-uvt.ro

Ana-Cristina NICOLESCU, Ph.D. Habil.
West University of Timisoara, Faculty of Economics and Business Administration/ Finance Department

E-mail: cristina.nicolescu@e-uvt.ro

Abstract

The European Structural and Investment Funds (ESI funds) are designed to support Europe's regions' territorial, economic, and social cohesion. Being the most powerful investment instruments under the EU budget, the ESI Funds have become an area of interest for international academic research in recent years. This study proposes a comprehensive review of the relevant scientific literature, emphasizing the impact generated by ESI funds on the social and economic development of member countries, using bibliometric analysis as a methodological approach. The article analyses 325 references from the Web of Science Core Collection database, published from 1998 to 2023. The scientific literature mapping was carried out by using the VOSviewer program. The results outline an increasing trend of publications in the field of ESI funds, starting with the year 2007. We also notice more articles published in emerging countries like Poland and Romania. Finally, the results highlight a relevant link between ESI funds and various terms emphasizing socio-economic development. Our study contributes to ESI funds and socio-economic development knowledge, highlighting the key concepts specific to previous research, the spatial distribution of publications, and the outstanding scientific works in the field.

1. INTRODUCTION

In the current crisis caused by the COVID-19 pandemic and the war in Ukraine, socio-economic development remains a central issue of the European Union's policies for the 2021-2027 programming period, firmly anchored in European treaties. Strengthening economic and social cohesion objectives are fulfilled based on a financial allocation through the European Structural and Investment Funds (ESI Funds). Depicting the most crucial investment instrument for member countries and the second-largest expenditure group in the Union's expected budget, the ESI Funds have become an area of interest for international academic research in recent years.

Several researchers (Tijanic & Obadic, 2015; Vukašina et al., 2022; Gouveia et al., 2021; Lovrinovic & Nakic, 2016) have quantified the impact generated by the ESI funds on the socio-economic development of the beneficiary countries, using a series of methodological approaches to analyze the effectiveness, impact, and added value of cohesion policy funding - mainly macroeconomic models, regression analysis and qualitative case studies (Bachtler et al., 2017: 12). However, the number of bibliometric studies investigating the link between ESI funds and the socio-economic development of the member states is limited. According to Nishimura et al. (2021: 50), no bibliometric study was found to have specifically analyzed the relevance of the literature in ESI funds and the development of EU countries. Consequently, our study contributes to the field by providing premises for further research and a starting point for relevant bibliographic references.

The literature review section illustrates the main findings on ESI funds and their impact on social and economic development. Subsequently, Section 3 emphasizes the methodological aspects of the bibliometric analysis. Finally, Section 4 includes the research findings, while Section 5 summarises the main findings and includes policy recommendations.

2. LITERATURE REVIEW

The Cohesion Policy is an intrinsic part of the EU public policies. It is considered a crucial union policy with a notable effect on developing all communities in the EU member states (Boc, 2020: 4). Moreover, being the central investment policy of the European Union, it provides the framework and strategy necessary to achieve the objectives of strengthening economic, social, and territorial cohesion.

The objectives of the Cohesion Policy are translated into financial terms through the European Structural and Investment Funds (ESI funds). Starting with 2007 - the beginning of the multiannual financial framework 2007-2013, we noticed a considerable increase in the number of studies focused on evaluating the impact of ESI funds. Thus, a series of methodological approaches were used to analyze the effectiveness, impact, and added value of cohesion policy funding - mainly macroeconomic models, regression analysis, microeconomic studies, and studies of qualitative cases (Bachtler et al., 2017: 12).

Since 1988, successive reforms of the Structural Funds have progressively increased the obligations of the European Commission and Member State authorities to undertake systematic evaluations of interventions ex-ante, during program implementation, and ex-post. Thus, Bachtler et al. (2017) appreciated the Cohesion Policy as the central element of the evaluations at the level of the Union, the Member States, and the regions, compared to any other area of EU policies.

The articles generally address the interdependence between the allocation of structural funds and various dimensions of socio-economic development since ESI funds cover a broad spectrum of investment areas, from road and rail infrastructure investments to innovation, renewable energy, and SMEs (Vukašina et al., 2022).

Several studies have found a positive impact of ESI funds on the economic development of the member countries. Based on a quantitative analysis of a panel dataset of 22 EU countries from 2000-2011, Tijanic & Obadic (2015) found that EU structural and cohesion funds payments positively influence competitiveness in the long run. Vukašina et al. (2022) demonstrated that structural funds have a statistically significant and positive impact on the economic development of the NUTS 2 region. Also, the empirical analysis conducted by Lovrinovic & Nakic (2016) on the ten transition economies over 14 years con-

firmed the positive effect of analyzed EU funds. The study results establish that EU funds promote growth in transition economies. If the EU funds increase by one percentage point on average, the GDP per capita growth rate will increase by 0.7 percentage points annually.

Furthermore, numerous scholars attested that ESI Funds significantly impact economic development and the social development of all communities in EU member states. Gouveia et al. (2021) found a positive relationship between the efficiency of EU national and regional programs implementation and more favorable socio-economic conditions in countries where those programs are implemented. Also, Biedka et al. (2022) examined the effects of EU cohesion-policy-funded human capital investment on productivity and population at the Polish municipal level. They found that human capital investments were influenced in the short and medium term. Yielding equivalent outcomes, Scotti et al. (2022) found that European NUTS 2 level, Structural, and Cohesion Funds positively associated with the R&D, Transport, Energy, and Human Resources sectors between 2007 and 2014. Additionally, Cristea and Dona (2017) found that the social economy sector in Romania has been improved by the foundation of approximately 1.400 social economy structures, the qualification or requalification of over 130,000 vulnerable people, and the creation of over 12.000 jobs in the founded structures after the implementation period 2007 - 2013.

Overall, these studies highlight the importance of ESI funds in promoting competitiveness, growth, human capital investment, sectoral development, and social inclusion in EU member states.

As a result of the growing number of articles and studies analyzing the link between ESI funds and socio-economic development, we propose a bibliometric analysis to assess the knowledge level in the literature due to the multifaceted character of this subject and its varied dimensions.

3. DATA DESCRIPTION AND METHODOLOGY

This study proposes the analysis of the literature in the field of ESI funds to highlight the impact generated by these financial instruments on the economic and social development of the EU member countries. We have conducted a bibliometric analysis, therefore a quantitative method of analyzing scientific publications, which has become popular in recent years, thanks to the advancement,

availability, and accessibility of bibliometric software such as Gephi, Leximancer, VOSviewer, and scientific databases such as Scopus and Web of Science, and the cross-disciplinary pollination of the bibliometric methodology from information science to business research (Donthu et al., 2021: 285).

The bibliometric indicators used in this paper include the number of publications on the research topic, the annual citation structure, the spatial distribution of publications, co-citation analysis, and keywords analysis. These bibliometric indicators comprehensively understand the topic's research landscape by identifying the most influential papers, trends, collaborations, and knowledge gaps.

The necessary data were extracted from the Web of Science Core Collection, one of the most suitable tools for scientometric analyses (Mongeon & Paul-Hus, 2016). The search strategy was: TS = ("European structural funds") AND ("economic development") AND ("social development"). The data sample generated included 353 documents, which were later limited to those written in English, resulting in 325 scientific works published from 1998 to 2023.

The relationship between ESI funds and socio-economic development has been a topic of increasing interest in the literature, as indicated in Figure 1. However, the first scientific publications date back to 1998, since the Union's annual budget was established following a medium-term financial plan, which defined the yearly limits of Community expenditure.

Figure 1. Evolution of the number of publications between 1998-2023
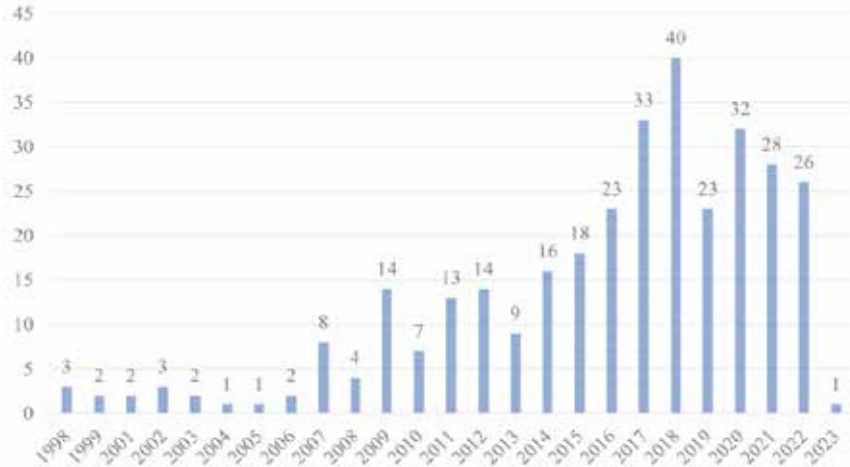
Source: Author's processing based on available data using VOSviewer

Starting in 2007, we noticed a considerable increase in studies focused on evaluating the impact of ESI funds, revealing a topic of interest. The observed increase in studies aligns with the significant increase in the allocation of funds through the multiannual financial framework. This influx of funds has created a greater need to assess their impact and ensure they are used effectively to promote regional development, economic growth, and social cohesion.

Although the trend of publications is growing during the analyzed period, the structure of scientific works citations (Table 1) differs yearly.

Table 1. The structure of publication citations between 1998-2022

Publication Year	Number of publications	Times Cited, WoS Core	Average Citation
1998	3.00	30.00	10.00
1999	2.00	34.00	17.00
2000	0.00	-	-
2001	2.00	7.00	3.50
2002	3.00	25.00	8.33
2003	2.00	12.00	6.00
2004	1.00	315.00	315.00
2005	1.00	49.00	49.00
2006	2.00	27.00	13.50
2007	8.00	40.00	5.00
2008	4.00	26.00	6.50
2009	14.00	335.00	23.93
2010	7.00	121.00	17.29
2011	13.00	263.00	20.23
2012	14.00	968.00	69.14
2013	9.00	251.00	27.89
2014	16.00	193.00	12.06
2015	18.00	835.00	46.39
2016	23.00	219.00	9.52
2017	33.00	612.00	18.55
2018	40.00	435.00	10.88
2019	23.00	329.00	14.30
2020	32.00	1,023.00	31.97
2021	28.00	1,291.00	46.11
2022	26.00	158.00	6.08
2023	1.00	-	-

Source: Author's processing based on available data using VOSviewer

We noticed an increase in the average number of publications citations in the last years of multi-annual financial frameworks. This underscores the interest in evaluations of post-ante (for completed financial frameworks) and ex-ante (for future financial frameworks). The rising number of citations in post-ante and ex-ante evaluations suggests a growing interest in assessing the impact of ESI funds and informing future policy decisions. By conducting rigorous evaluations, policymakers and researchers can learn from past experiences, improve program effectiveness, and enhance the overall socio-economic outcomes of these funds.

4. EMPIRICAL RESEARCH AND RESULTS

The scientific literature was mapped using the VOSviewer software through the VOS mapping technique. According to Van Eck & Waltman (2007), VOS provides a low-dimensional visualization in which objects are located so that the distance between any pair of things reflects their similarity as accurately as possible.

4.1. Keywords analysis

The keywords are considered a core element that summarises and represents the papers' content (Kwon, 2018: 77). Therefore, it is crucial to quantify the distribution of the most common keywords.

The analysis of the 325 scientific papers generated a total number of 1028 keywords. According to the network returned by the VOSviewer, which highlights the most relevant 49 keywords, considering a threshold of 3 co-occurrences (Figure 2), the top keywords are: "structural funds" (49 occurrences), "cohesion policy" (26 occurrences), "European Union" (22 occurrences), "regional development" (17 occurrences), "economic growth" and "sustainable development" (both 13 occurrences).

Figure 2. Co-occurrence network of author keywords
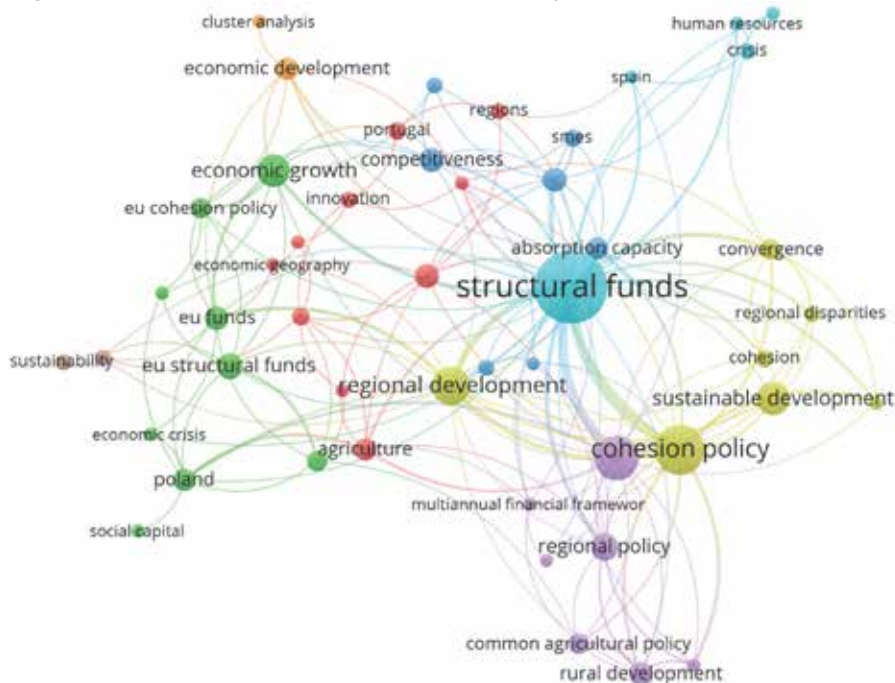
Source: Author's processing based on available data using VOSviewer

The relevance of each keyword is also illustrated through nodes whose sizes indicate the importance degree: the larger the node, the more relevant the term it represents within the sample. The connections between two nodes, graphically represented by curves, describe the frequency of occurrence of the two words they connect: the thicker the curved connecting line, the more frequent the simultaneous occurrence of the two keywords joined by that line, and the shorter the connecting curve, the stronger the relationship between the two terms it enters. Figure 2 highlights the existence of strong links between "structural funds", "regional development", "cohesion policy", and "European Union".

The analysis does not establish a direct link between structural funds and socio-economic development since socio-economic development represents a multidimensional category characterized by several interdependent processes, such as social, economic, political, cultural, technical, and psychological phenomena (Stec et al., 2014). However, the total link strength, scored 78, for the keyword "structural funds", illustrates its multiple associations with various terms that define socio-economic development, organized in 3 clusters (Table 2).

Table 2. Keyword clusters

Cluster	Items
#1-Red	"Agriculture", "Development", "Economic geography", "Entrepreneurship", "European Integration", "Human capital", "Innovation", "Knowledge", "Portugal", "Regions"
#2-Green	"Economic crisis", "Economic growth", "EU Cohesion Policy", "EU funds", "EU Structural Funds", "Poland", "Rural areas", "Social capital", "Transport infrastructure"
#3-Yellow	"Cohesion", "Cohesion policy", "Convergence", "European regional development", "Regional development", "Regional disparities", "Sustainable development"

Source: Author's processing based on available data using VOSviewer

4.2. Countries and co-authorship analysis

Countries and co-authorship analysis illustrate the spatial distribution of total production in the field and researchers' collaboration. Furthermore, this approach enables the analysis of research teams' behavior and network of relationships, identifying influential countries or institutions (Lobonț et al., 2021: 46).

Authors from 34 countries are grouped into 5 clusters based on their collaboration patterns in ESI funds (Figure 3). Cluster 1 (red) comprises the eight most influential countries: Australia, Canada, Denmark, Italy, Japan, China, South Africa, and Switzerland. All these countries have an essential collaboration based on the distance between the nodes and the thickness of their lines. The next one is green, which contains the following countries: Croatia, Finland, Greece, Ireland, Scotland, Sweden, and Wales. The blue cluster consists of countries such as the Czech Republic, Hungary, Poland, Russia, Slovakia, and Ukraine. The fourth cluster comprises six countries: England, France, Germany, Lithuania, Romania, and the USA, while the last cluster comprises six countries: Belgium, Brazil, Netherlands, Norway, Portugal, and Spain.

Figure 3. Countries' co-authorship network
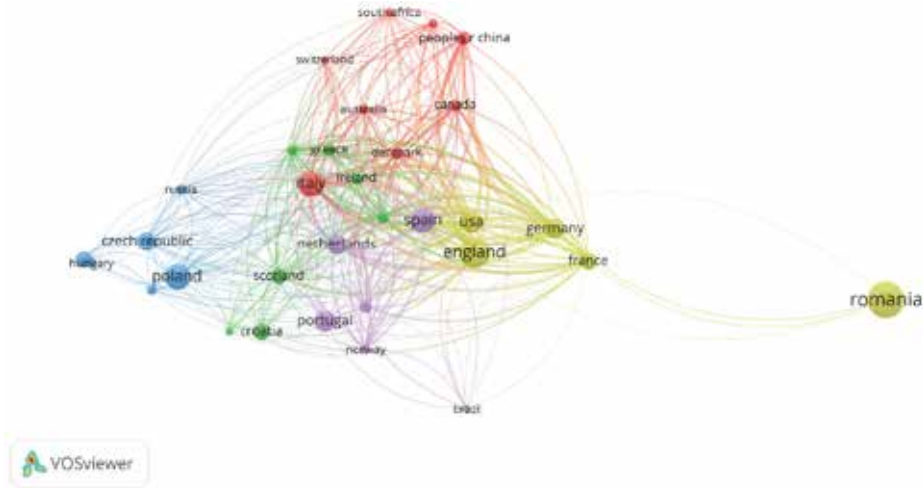
Source: Author's processing based on available data using VOSviewer

This analysis illustrates that structural funds interest researchers worldwide, beyond European Union boundaries.

Table 3. The most productive countries

Ranking	Countries	Number of publications	%	Total link strength
1	Romania	62	19.08%	4
2	England	46	14.15%	178
3	Italy	35	10.08%	159
4	Poland	34	10.46%	43
5	Spain	33	10.15%	150
6	USA	26	8.00%	154
7	Portugal	25	7.69%	38
8	Netherlands	22	6.77%	149
9	Germany	22	6.77%	154
10	Czech Republic	20	6.15%	50

Source: Author's processing based on available data using VOSviewer

According to results in Table 4, the highest number of papers on Structural Funds and the socio-economic development of EU countries was published in Romania (62 documents), followed by England (46 documents), Italy (35 papers), and Poland (34 papers). Even if Romania ranks 1st with the highest number of published articles, the total link strength is only 4, which shows a low

collaboration between Romanian and foreign authors. The highest total link strength is for England, which proves that English researchers have strong links with researchers from all over the world.

Furthermore, these results highlight the predominant body of literature in CEE member countries (Romania and Poland) due to their substantial engagement with these funds. Moreover, Eastern European countries' academic and policy discourse may focus more on European funding and integration.

4.3. CITATION ANALYSIS

The third part of the bibliometric analysis highlights the most relevant publications in the field. This part of the analysis aims to identify critical papers or studies that have significantly contributed to understanding the ESI funds topic. By identifying these relevant publications, researchers can gain insights into the field's foundational works and influential research. Figure 4 illustrates the results from analyzing 325 publications, with at least 5 document citations.

Figure 4. Documents citation network
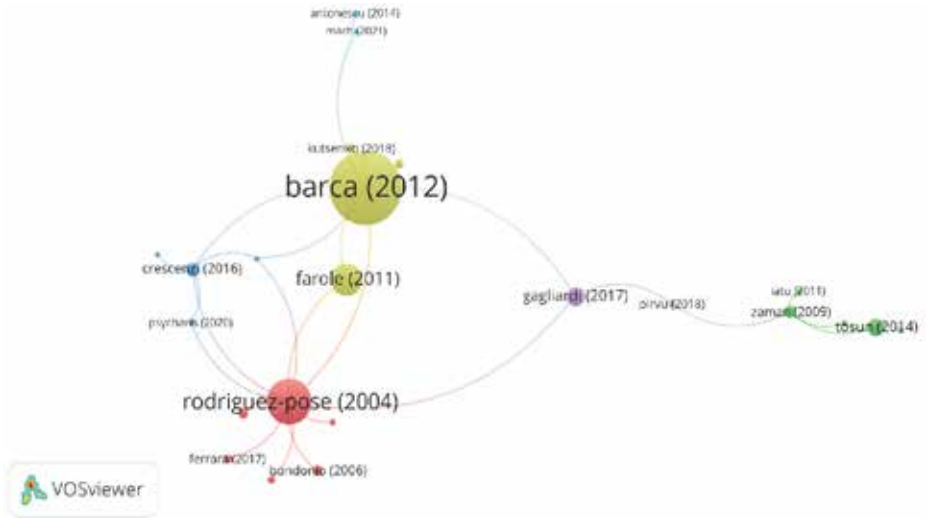
Source: Author's processing based on available data using VOSviewer

Of the 325 documents, 132 meet the threshold, yet, considering the number of citation links calculation, a limited number of 23 papers are connected. The documents are grouped into 6 clusters: the first cluster contains publica-

tions that study the relationship between structural funds and employment, research, technological development and innovation, transport infrastructure, investment in education and human capital, and entrepreneurship. Cluster 2 comprises publications that analyze the EU funds absorption rate. Cluster 3 contains works designed to explore the impact of structural funds on regional development. Cluster 4 consists of publications that analyze the factors that influence the effectiveness of the implementation of structural funds, and clusters 5 and 6 contain studies that examine general aspects of structural funds.

Table 4. The most cited publications

Title	Authors	Number of citation	Publication
The case for regional development intervention: place-based versus place-neutral approaches	Fabrizio Barca, Philip McCann, Andrés Rodríguez-Pose	699	Journal of Regional science
Between Development and Social Policies: The Impact of European Structural Funds in Objective 1	Andrés Rodríguez-Pose, Ugo Fratesi	315	Regional Studies
Cohesion Policy in the European Union: Growth, Geography, Institutions	Farole Thomas, Andrés Rodríguez Pose, and Michael Storper.	175	Journal of Common Market Studies
The impact of European Cohesion Policy in urban and rural regions	Gagliardi, Luisa, and Marco Percoco	75	Regional Studies
Absorption of regional funds: A comparative analysis	Tosun, Jale	65	Journal of Common Market Studies

Source: Author's processing based on available data using VOSviewer

According to the results summarized in Table 4, the most cited scientific works were published in the Journal of regional science (IF= 2,807), Regional Studies (IF= 4,595), and Journal of Common Market Studies (IF= 1,167). By identifying these high-impact journals, the analysis highlights important sources for researchers seeking to explore the existing literature on structural funds and related topics.

5. CONCLUSIONS

The article explored the relationship between ESI Funds and the socio-economic development of EU countries by performing a bibliometric analysis focused mainly on the evolution of publications number, annual citation structure, keywords analysis, publications' productivity by country, and citation analysis.

Twenty years of literature analysis revealed that more than 80% of the articles in the sample were published from 2012 to 2023 and that the topic has gained increased attention in recent years.

The keywords analysis highlighted that the top common keywords are "structural funds", "cohesion policy", "European Union", "regional development", "economic growth", and "sustainable development". However, the results did not emphasize a direct link between the two analyzed topics since socio-economic development represents a multidimensional category encompassing many factors and dimensions.

The spatial distribution of total production showed that the highest number of papers on Structural Funds and the socio-economic development of EU countries was published in Romania (62 documents), followed by England (46 documents), Italy (35 papers), and Poland (34 papers). Compared to Southern European countries (Italy) and Northern and Western European countries (England), the findings indicated that CEE member countries (Romania and Poland) are more interested in European funds, as the achievement of economic and social development objectives in these countries is directly dependent on the allocation of these funds.

Furthermore, the most cited scientific works were published in the Journal of regional science (IF= 2,807), Regional Studies (IF= 4,595), and Journal of Common Market Studies (IF= 1,167). By highlighting these important sources, the analysis provides valuable guidance to researchers interested in exploring the literature on structural funds.

According to the employed analysis, the topic investigating the link between structural funds and the socio-economic development of the member states proved to be prevalent. Moreover, it raises constant interest among researchers since socio-economic development represents a central element of the European Union's policies for the 2021-2027 programming period.

In addition, the results of this research may have a significant impact on academia. The identified keywords indicated the multidimensional nature of socio-economic development. Furthermore, the spatial distribution of publications suggested that the field interests researchers from various countries, exceeding EU member state and indicating global relevance.

Based on the findings of this study, we can enclose several policy recommendations. Primarily, it is necessary to foster an environment open to collaboration and knowledge dissemination between countries with higher publication productivity (Romania, Italy, and Poland) and those with lower productivity (Belgium and Denmark). This approach can bridge the knowledge disparity and ensure that best practices are shared across different regions, contributing to more effective use of ESI funds. Also, the decision-makers must consider enhancements to monitoring and evaluation mechanisms of the ESI funds, thereby fostering a more effective evaluation of their impact on socio-economic development. The assessment process must incorporate common indicators, set clear targets for all member states, and systematic evaluations. Monitoring and evaluation efforts should encompass the distribution of the findings to relevant stakeholders, including future beneficiaries and the academic community. Overall, the study enriches the current literature on ESI funds and can serve as a significant reference point for future research and policy initiatives.

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ELASTICITY OF CFC RULES - EFFECTIVE TAX RATES

Ivan ČEVIZOVIĆ, Ph.D.
Čevizović Ivan j.t.d.

E-mail: ivan.cevizovic@cevizovic.eu

Abstract

In Croatia, the initial tax reform in 2016 covered a significant part of the tax system, emphasizing tax simplification, expanding the tax base, and the ever-present relief of citizens and the economy in general. In addition to measurable microeconomic effects, the tax reform had the task of suppressing the practice of tax evasion through profit shifting due to the dispersion and non-uniform systems of profit taxation. The OECD BEPS project, through 15 different chapters and measures, is designed to deal with the global phenomenon where it wants to end tax fraud, including evasion and sophisticated methods of aggressive tax planning. It is essential to note that the amended legal framework does not tax a controlled foreign corporation that performs a specific subject activity and has certain expenses, assets, and employees but only taxpayers who operate in several countries through related parties (offshore entities in low-tax or no-tax jurisdictions). Therefore, the degree of implementation of CFC rules and Council Directive (EU) 2016/1164 (ATAD) in national tax systems, measured by the effective tax rate, is compared within the EU framework. The results of the analysis point to partial harmonization at the EU level concerning the global framework.

Keywords: *CFC rule, statutory corporate tax rates, effective average tax rates, effective marginal tax rates.*

JEL Classification: *H21, H25, H26, M20*

1. INTRODUCTION

Although often used as a tool for comparing different countries and even taxpayers within the same country with a more complex taxation system, the corporate tax rate is a convenient but not a good tool. Namely, as the taxpayer's

tax burden is the result of two variables – the corporate tax rate and the tax base – comparing only tax rates can lead to a wrong conclusion. It is indeed possible that in one jurisdiction, the corporate tax rate is lower, even significantly lower, than in another, but that the effective tax burden is higher or even significantly higher. By prescribing various elements, such as tax-allowable depreciation, the recognized portion of some categories of expenditure (for example, business entertainment costs, costs of personal vehicles, etc.), countries directly affect the amount of taxes, and thus the tax burden of their taxpayers. At the same time, the tax base definition can also direct the entrepreneur through a "signal" of tax-recognized unrecognized income and expenses, which can direct to desirable (or more desirable) activities. In contrast, the corporate tax rate is equally reflected on the same tax base.

The effective tax rate is, therefore, a better indicator and tool for comparing the tax burden in a particular country. Putting into relation the determined amount of tax with profit, as a category of financial statements, measured according to the appropriate financial reporting framework, enables a quick, efficient, and straightforward insight into the effect of the tax system of a particular tax jurisdiction (country) on business. Comparability of the base, namely profit before tax, as a rule, follows the general criteria of comparability of different businesses, which is ensured by a robust set of financial reporting standards, especially supranational ones, as a suitable guarantor of comparability of achieved performance in business as well as the potential for future periods. Therefore, it is not surprising that financial reporting standards require the publication of data on effective tax burden, that is, effective tax rate as a measure of that burden.

In addition, if the average rate of corporate tax is observed, it enables a comparison between taxpayers operating within the same tax system, which is particularly relevant in the case of several different tax rates/classes in the tax tariff of a particular country. Likewise, this is a good indicator for comparing the tax burden of individual countries because the average corporate tax rate, inc In other words, the average corporate tax rate between different industries within the same country, indicates the direction and effect of tax policies. The totality of the effective tax rate was shown by Fullerton (1983).

Table 1. Taxonomy of Effective Tax Rates

Type of Effective Tax Rate	Definition	Examples of studies that estimate or use such rates
Average Effective Corporate Tax Rate	Observed corporate taxes divided by "correctly measured" corporate income. Current cash flows ignore future consequences.	Shoven and Bulow, 1976 Sunley, 1976a Fiekwsky, 1977 Pechman, 1977 Tax Notes Supplements, 1982 Fullerton,1982 Horst, 1982
Average Effective Total Tax Rate	Observed corporate taxes plus property taxes plus personal taxes on interest and dividends divided by total capital income.	Harberger, 1966 Rosenberg, 1969 Shoven, 1976 Fullerton, Shoven and Whalley, 1978; 1983 Feldstein and Summers, 1979 Feldstein, Poterba and Dicks-Mireaux, 1983 Slemrod, 1983
Marginal Effective Corporate Tax Wedge	The expected real pre-tax rate on return on a marginal investment minus the real after-tax return to the corporation.	Auerbach and Jorgenson, 1980 Jorgeson and Sullivan, 1981 Halll, 1981, Bradford and Fullerton, 1981 Hulten and Wykoff, 1981b Gravelle, 1982 Auerbach, 1982
Marginal Effective Corporate Tax Rate	The marginal effective corporate tax wedge is divided by the pre-tax return (tax-inclusive rate) or the corporations' post-tax return (tax-exclusive rate).	Economic Report of the President, 1982 Hulten and Robertson, 1982 Fullerton and Henderson, 1983 Oliner, Haveman and David, 1983
Marginal Effective Total Tax Wedge	The expected real pre-tax rate of return on a marginal investment minus the real after-tax return to the saver who provides the finance.	Boadway, Bruce and Mintz, 1982 King and Fulerton, 1983
Marginal Effective Total Tax Rate	The marginal effective total tax wedge is divided by the pre-tax return (tax-inclusive rate) or the savers' post-tax return (tax-exclusive rate).	Boadway, Bruce and Mintz, 1982 King and Fulerton,1983

Source: Fullerton,1983

In addition to the average corporate tax rate, the marginal corporate tax rate is also a good indicator. Although the marginal corporate tax rate often cor-

responds to the nominal rate, it can be a relevant tool in comparing the tax burden between different countries. Marginal tax rates are used in a variety of tax systems, including income taxes (Mertens et al. 2018; Saez et al. 2012), capital gains taxes (Auerbach 1989; Poterba 1987), and consumption taxes (Mendoza et al. 1994; Creedy et al. 2002; Auerbach 2006). Also, marginal tax rates have important implications for labor supply (Stuart 1981; Burtless et al. 1978; Hausmann et al. 1984), income distribution (Altig et al. 1999; Mayeres et al. 2001), and tax revenue (Diamond 1998; Dahlby et al. 2011). Normative analysis by Judd (1985) and Chamley (1986) showed that when the tax instruments available are a capital income tax and a labor income tax, the optimal long-run tax on capital income is zero while it is positive for labor income; the same result is obtained when a consumption tax replaces a labor income tax.

1.1. PURPOSE AND OBJECTIVES OF THE PAPER

Through a desk macro analysis, the paper contributes to clarifying the effects of CFC rules on national regulatory frameworks in preventing double taxation. An initial assumption can be made that the tax authorities had enough resources and time for individual harmonizations of national legislation. The need to create an analytical framework for the Anti-Tax Avoidance Directive – ATAD) certainly can and should contribute to a general and comprehensive understanding of the totality of 15 individually and aggregated rules concerning national frameworks. Due to the comprehensiveness and breadth of the measures, the paper presents only the CFC rule measured by applying the effective tax rate. The objectives of the paper can be presented as follows:

- defining the scope and sphere of CFC rules in the observed EU countries;
- description and explanation of borderline substances that do not imply the application of CFC rules;
- description of the features of the request for exemption or exclusion of CFC rules;
- presentation of national tax rates broken down into three subgroups: (i) statutory corporate tax rate in 2022; (ii) average effective tax rate in 2021, and (iii) effective marginal tax rate for 2021.

The final objectives of the paper are to analyze and show the effects of implementing the Council Directive (EU) 2016/1164 on establishing rules against

tax avoidance practices that directly affect the functioning of the internal market. The Directive mentioned above directly indicates efforts and a set of measures aimed primarily at improving the distribution of profits in the internal EU market. To achieve the above, it is necessary to regulate the rules in the following areas: (a) limitation of interest deduction (Art. 4), (b) output taxation (Art. 5), (c) general rule on the prevention of abuse (Art. 6), (d) rules on controlled foreign companies (Art. 7) and (e) rules to tackle hybrid mismatches (Art. 9). However, as the enumerated areas are not supranationally uniform and fully harmonized, the result of the interaction often manifests through double taxation, in consequence of which it is justified to consider that such companies should reduce the tax base by deducting the tax paid in one of the EU members states, third countries, or companies resort to more profitable and robust solutions by moving profits to tax havens. For tax havens, it should be borne in mind that the obligation to calculate withholding tax at 20% on all services applies to non-cooperative areas. Only services can be relevant when transferring profits to such companies since no goods can be delivered (see Šimurina et al., 2015).

Previous studies observe the CFC rule, in general (Dourado, 2015), from a legal (Žunić Kovačević, 2020) or economic point of view (Damjanović, 2019). The paper emphasizes the consideration and analysis of the effects of CFC rules on national regulatory frameworks. Accordingly, the following research questions were posed:

- A. Have the observed EU member states implemented the Council Directive (EU) 2016/1164 in national regulatory frameworks concerning the CFC rule, and to what extent?
- B. What are the reasons for the exemption or exclusion of CFC rules from national regulatory frameworks?
- C. Concerning research questions A and B IP B, what is the value of the effective tax rate measured with three sub-rates?

On the basis of which research objectives were formed:

- analysis of the state and possibilities of application of CFC rules in a broader and narrower geographic identity and time context measured through national regulatory frameworks to date,
- evaluation of the totality of exemptions and exclusions in the observed EU countries,

- Identify desirable EU tax destinations assuming Croatian companies plan to establish foreign-controlled subsidiaries to maintain satisfactory domestic profitability.

The paper consists of four parts. After introducing and defining the research framework, the second part of the paper provides an overview of the selected literature, where the CFC rule is terminologically defined. After that, in the methodological part of the paper, an overview of the state of implementation of the additional tax in the national tax frameworks of selected EU countries is given. At the end of the paper, the main conclusions are described.

2. THEORETICAL LITERATURE REVIEW

OECD Report Addressing Base Erosion and Profit Shifting from 2015 defined the term BEPS as tax planning strategies that exploit gaps and mismatches in tax rules to make profits "disappear" for tax purposes or to shift profits to locations where there is little or no actual activity. However, the low taxes result in little or no overall corporate tax being paid. The Action Plan, which the G20 fully endorsed, outlined 15 actions that should be adopted in various areas. However, fundamental changes to the international tax architecture and the current source and/or residence dichotomy were ruled out. The technical work was undertaken by the OECD Committee on Fiscal Affairs (CFA) through several Working Parties (WPs) and other subsidiary bodies (Panayi, 2016:629). The outcomes in the final package have been placed in three categories (Picciotto, 2017:35):

- Minimum Standards, dealing with cases where inaction by a country could create negative spill-overs so that participating countries have agreed to commit to consistent implementation: combating Harmful Tax Practices (Action 5), preventing treaty shopping (Action 6), ensuring Country-by-Country Reporting (Action 13), and improving dispute resolution (Action 14).
- Common Approaches to facilitate the convergence of national practices: transfer pricing (Actions 8, 9, 10), changes to the Permanent Establishment definition (Action 7), limiting the deductibility of interest expense (Action 4), and neutralizing hybrid mismatch arrangements (Action 2).

- Guidance drawing on best practices, which countries may adopt if and as they choose: mandatory disclosure by taxpayers of aggressive tax schemes (Action 12) and Controlled Foreign Corporation (CFC) rules (Action 3).

In this context, it should be noted that the six building blocks included the definition of a CFC of CFC income and the attribution of CFC income. The building blocks generally encompassed the elements included in existing CFC rules and reflected best practices (Panayi, 2016:633). Controlled foreign company (CFC) rules respond to the risk that taxpayers with a controlling interest in a foreign low-taxed subsidiary can shift income into it and avoid taxation. CFC rules combat this by enabling jurisdictions to tax income earned by foreign subsidiaries without waiting for actual income distribution, which may be postponed indefinitely (OECD, 2015).

Of the research studies that focus on the effect of CFC rules on the behavior of MNCs, the research studies by Markle and Robinson (2012) and Ruf and Weichenrieder (2012) should be singled out. Markle and Robinson (2012) advocate a position that is reflected in the positive performance of the application of CFC rules, which leads to a reduction in the use of tax havens, i.e., bilateral agreements lead to increased use of a particular haven, while a higher withholding tax rate reduces the need for a haven country. Ruf and Weichenrieder (2012) studied the application of the CFC rule in Germany, which restricts the establishment of foreign subsidiaries in countries with low taxes in order to protect passive income concerning domestic taxation, and they found the German CFC rule to be quite effective thanks to the tax reform of 2001.

3. RESEARCH METHODOLOGY

3.1. Sample Description and data collection

In the previous chapter, certain content elements of the paper were observed and analyzed. First, the term effective tax rate was explained, and then the role and importance of CFC were shown. It is now necessary to establish a basic model that explains the advantages and consequences of introducing and implementing CFC rules. However, the research subject of the paper includes the regulatory framework of individual EU member states and the degree of compliance of individual provisions with the Council Directive (EU) 2016/1164

on establishing rules against tax avoidance practices that directly affect the functioning of the internal market. Given the different sizes of member states and different numbers of companies within member states, the subject of the research is also directed towards the modalities of application of EU provisions within national frameworks.

The geographic identity of the study includes a sample of 25 EU member states, namely EU countries detailed in Appendix A, while certain countries such as Malta and Great Britain are excluded from observation and analysis. Since Malta has the highest statutory corporate income tax rates in the World (35% in 2022), it is not a potential investment location, while Great Britain (19% tax rate in 2021) is excluded due to Brexit. The purpose of the paper has been achieved by using the described features. The time dimension of the study includes regulatory arrangement and compliance of national frameworks of each EU member state with the Directive after the date of entry into force of January 1, 2019. For example, Slovenia only prescribed the introduction of CFC rules in 2019, in contrast to Sweden and Hungary, which did so in 1989 and 1997.

By reviewing and researching secondary data, national regulatory frameworks are described by collecting and analyzing publicly published reports as of May 15, 2023, which includes OECD analyses, PWC, Deloitte, and EY summaries, Tax Foundation search, reviews by Reuters Tax News, Orbitax and similar agencies, and national regulatory frameworks of the observed EU member states. Therefore, the paper tries to answer the research questions and determine the degree of compliance of national frameworks with the CFC rule, i.e., the reflection of (non)compliance on the national effective tax rate.

3.2. Operationalization of variables

Marginal tax rate and effective tax rate are two important concepts related to taxation. Although they are often used in different syntaxes and contexts, it is necessary to be aware of the terminological understanding of these two concepts. Effective tax rates are an essential component of many tax systems, and they are used to measure the overall tax burden on a taxpayer. They can be used to compare tax burdens across different taxpayers or different tax systems. In the context of income tax, the effective tax rate is calculated by dividing the total amount of tax paid by the total taxable income. This calculation considers

all taxes paid, including income, payroll, sales, and property taxes. Effective tax rates vary depending on taxpayers' income, deductions, and credits. However, effective tax rates are often used to evaluate the progressivity of a tax system. A progressive tax system is one in which the tax rate increases as income increases, and effective tax rates are typically higher for high-income individuals than low-income individuals. In contrast, a regressive tax system is one in which the tax rate decreases as income increases, and effective tax rates are typically higher for low-income than high-income individuals.

Still, the OECD methodology has been described in detail in the OECD Taxation Working Paper No. 38 (Hanappi, 2018), building on the theoretical model developed by Devereux and Griffith (1999) and (2003). According to Gemmell et al. (2017) and Hanappi (2018), the tax-inclusive effective marginal tax rate (EMTR) measures the extent to which taxation increases the user cost of capital; it corresponds to the case of a marginal project that delivers just enough profit to break-even but no economic profit over and above this threshold:

$$EMTR = \frac{(cost\ of\ capital) - (real\ interest\ rate)}{(cost\ of\ capital)}$$

Where is the cost of capital (CoC) is defined as the real pre-tax rate of return required to generate a zero post-tax economic rent; as such, it is linked to the EMTR but also accounts for the interest rate and the rate of economic depreciation of the asset. On the other side, according to Gemmell et al. (2017) and Hanappi (2018), the effective average tax rate (EATR) reflects the average tax contribution a firm makes on an investment project earning above-zero economic profits. It is defined as the difference in pre-tax and post-tax economic profits relative to the NPV of pre-tax income net of real economic depreciation:

$$EATR = \frac{(Economic\ profit^{\,Pre-tax\ NPV}) - (real\ interest\ rate)}{(cost\ of\ capital)}$$

The Corporate Tax Statistics database contains four forward-looking tax policy indicators reflecting tax rules: (i) the effective marginal tax rate (EMTR); (ii) the effective average tax rate (EATR); (iii) the cost of capital; and (iv) the net present value of capital allowances as a share of the initial investment. In the paper, the effective marginal tax rate (EMTR) and effective average tax rate (EATR) are presented and connected with the CFC rules. Table 2 provides an

overview of the essential characteristics of the observed countries, calculated based on values from Appendix A, classified into three groups of tax rates.

Table 2. Descriptive values of the observed 25 EU countries based on Appendix A

25 EU countries			
Variable	Statutory corporate 2022 (%) - CIT	Effective average 2021 (%) - EATR	Effective Marginal 2021 (%) - EMTR
Min.	9.00	10.20	-30.40
Max.	31.50	26.60	15.00
Median	21.30	19.70	8.60
Mode	20.00	23.30	0.00
Mean	21.60	19.35	5.39
Standard deviation	5.11	4.35	11.03
Variance	26.11	18.90	121.61

Source: Author's calculations.

The distribution of CIT rates changed significantly between 2000 and 2021. In 2000, 13 jurisdictions had tax rates greater than or equal to 40 %, while in 2021, no jurisdictions with tax rates greater than or equal to 40% (OECD, 2021). According to the OECD, these declining rates highlight the importance of the global minimum tax rules developed under Pillar Two, which will put a multilaterally agreed limit on corporate tax competition (EY, 2021). The average top corporate rate among EU25 countries is 21.60 percent, while according to Enache (2022), 23.57 percent in OECD countries and 32 percent in the G7. Also, in Austria, the corporate income tax will be cut from 25 percent to 24 percent in 2023 and further to 23 percent in 2024 (PWC, 2022).

The application of marginal tax rates varies depending on the tax system used. For example, in an income tax system, marginal tax rates determine the tax liability of individuals and businesses. In a capital gains tax system, the marginal tax rate is applied to the gain on the last euros of a capital asset sold. The marginal tax rate is applied to the last euros of consumption in a consumption tax system. The average EATR across jurisdictions (19.35%) is 2.25 percentage points lower than the average statutory tax rate (21.60%), which correlates with the OECD 2021 report. The median EATR is 1.60 p.p. lower (19.70%) than the median statutory tax rate (21.30%). At the same time, the rest of the

jurisdictions covered have EATRs between 10.20% (Iceland) and 26.60% (Germany), and similar values on a larger sample are provided by the OECD 2021 report. Also, according to the same report, several jurisdictions have EATRs at the higher end of this range due to the decelerating effect of their tax depreciation rules (for example, Austria and Belgium).

While the effects of tax depreciation and macroeconomic parameters work in the same direction as in the case of the EATR, their impacts on the EMTR will generally be more substantial because marginal projects do not earn economic profits (OECD, 2021). As a consequence, OECD reports jurisdictions with relatively high statutory CIT rates and relatively generous capital allowances, notably Italy (-30.4%), France (8.5%), and Portugal (-22.8%), rank lower. Effective marginal tax rates (EMTRs) are the lowest in jurisdictions with an allowance for corporate equity (ACE), i.e., Belgium and Poland. High marginal tax rates can discourage work, savings, and investment, leading to economic inefficiencies. For example, if the marginal tax rate is too high, individuals may choose to work less or not at all, reducing overall labor supply and economic growth.

Similarly, high marginal tax rates on investment income can discourage savings and investment, reducing capital accumulation and economic growth. On the other hand, marginal tax rates can also play a role in reducing income inequality and funding government programs. In a progressive tax system, higher-income individuals pay a higher marginal tax rate than lower-income individuals, resulting in an equal distribution of after-tax income.

According to OECD (2021), some jurisdictions have decreased the generosity of their tax depreciation rules, resulting in an increase in the EMTRs in 2020 compared to 2019; this group includes Belgium (7.4 percentage points) and the Czech Republic (2.9 percentage points) as well as Italy (11.9 percentage points), where enhanced capital allowances for certain tangible assets have been replaced with a relatively less generous tax credit. In Belgium, this decrease in the generosity of tax depreciation has been partially offset by a decrease in the statutory tax rate. On the other hand, several jurisdictions have increased the generosity of their tax depreciation rules, leading to lower EMTRs in 2020; this group includes Austria (4.1 percentage points), Germany (1.9 percentage points), and Finland (1.2 percentage points).

3.3. Research results

The fundamental model is based on simultaneous (double) taxation, as Popović (2018) described. The cause of international double taxation is the fact that modern countries simultaneously use two criteria for determining tax liability: the principle of unlimited tax liability according to which fiscal residents pay tax on worldwide income (profit) and the principle of the source of income (profit) according to which fiscal non-residents pay tax only on income (profit) realized on the territory of a particular country (Polanec, 2005). Specifically, if a Croatian resident generates dividend income in Malta over time, there is a possibility that both tax authorities will show an interest in taxing the displaced income. If the described scenario comes to pass, which is very likely, the realized income may be subject to double taxation, which would put the Croatian resident in a disadvantageous position compared to another Croatian resident who realizes the same amount of profit exclusively in Croatia. Such practice calls into question the equality of taxpayers and implies the failure of Musgrave's horizontal equity, where taxpayers in a similar situation are treated equally (McDaniel et al., 1993; Musgrave, 1993). It is generally true that a tax is more satisfactory as it is less neutral and serves more to divert production and consumption from the directions in which the free market would direct them (von Mises, 1998).

Again, the established theory of international trade rests on an increase in production worldwide if a particular factor of production is moved from country A to country B, provided that the marginal product of that factor in country B is, to that extent, more significant than in country A, thus canceling the effect of the cost of moving profits (Popović, 2018). Numerous authors have studied and researched the negative effects of double taxation (Šimurina et al., 2015; Bilas et al., 2006). However, there is a consensus regarding the effects of double taxation as they adversely affect the efficiency of capital allocation and endanger market mechanisms (Antić, 2017). In such conditions, the economic position of taxpayers focused on doing business within the borders of the national economy improves, and the position of those companies that participate in the international division of labor worsens because only their income and assets are cumulatively subject to taxation (Popović, 2018). Therefore, it is necessary to determine and ultimately decide what is more relevant – citizenship, residency, or the origin of the payment (Popović, 2018). The final model presented according to Dharmapala (2014) respecting CFC rules is shown in Table 3.

Table 3. Taxonomy of Effective Tax Rates

Payoffs of countries A and B CFC rule (b1)		Country B	
		No CFC rule (b2)	
Country A	CFC rule (a1)	200, 200	180, 212 *(-20)* *(+12)*
	No CFC rule (a2)	212, 180 *(+12)* *(-20)*	192, 192 *(+12)* *(-20)*

Source: Adapted from Dharmapala (2014).

Several scenarios can be identified from the attached model. In the first scenario, where there is no CFC rule, company A makes a pre-tax profit of 200 euros (a1), and at the same time, company B records similar values (b1). Each firm then transfers income to branch K which then, in a reciprocal process, lends money to companies A and B. Each company makes an after-tax profit of 192 euros (€200 less the €4 cost of profit shifting) where the income is zero. In the second scenario, let country A unilaterally introduce the CFC rule, which implies that country A taxes the dividend income earned by company A in subsidiary K. Due to a less favorable position, company A will stop diverting income and pay a tax of 20 euros to A and 20 euros to B. An alternative option for company A is to invest in another country – M. The introduced CFC rules eliminate the possibility of transferring income from country K for company A, so the investment in K would generate a pre-tax income of 180 euros and an after-tax income of 144 euros, which is less than the 180 euros earned after taxation of a1 and b1. The payment of country A due to the unilateral introduction of the rule amounts to 180 euros (sum of the profit of company A after taxation (160 euros) and 20 euros from income generated through resident business), that is, if the above is not done, then the scenario of 192 euros is more likely, which confirms that the unilateral introduction of CFC rules is not justified. As the set model shows, both countries are better if each can commit to CFC rules. This is referred to by the Council Directive (EU) 2016/1164, where according to the CFC rule, the income of a controlled subsidiary that pays a low tax rate is reattributed to the parent company, and the parent company pays tax for the attributed income in the country in which it is resident for tax purposes. Depending on the country's policy priorities, CFC rules may target the entire subsidiary that pays a low tax rate, specific categories of income, or only income that has been artificially diverted to the subsidiary, allowing companies to use certain benefits (mismatches between EU countries) in terms of tax planning.

The implementation of CFC rules in the regulations of 25 EU member states is shown in Appendix A, presenting a satisfactory degree of harmonization with the possibility of further effective and joint action in terms of more robust support for the introduction of CFC rules in order to standardize economic and legal consequences. According to Avi-Yonah et al. (2011), presumably, the reason for this result is that while the EU countries have a lower statutory rate (Section 3.2.), their tax base is more significant because it has fewer exceptions (s. Appendix A). Compared to the CFC rules of the US (Subpart F) and the major EU jurisdictions (Germany, Italy, France) indicates that the EU CFC rules tend to be more challenging than Subpart F because (a) they take into account the effective tax rate in the source country in deciding whether to tax income from a CFC and (b) they take into account whether the CFC has a real presence in the source country concludes Avi-Yonah et al. (2011). Dueñas (2019) described the application of CFC rules around the world.

CFC Rules in France apply to foreign subsidiaries or permanent establishments of a French company that a French parent company controls. Indirect and direct control of shares or voting rights determines the CFC status (Deloitte, 2019). The control threshold for CFC purposes is 50 percent, and the rules apply to income generated by any branch or entity established or organized in a low-tax jurisdiction, meaning a jurisdiction with a tax rate that is less than 50 percent of the French rate. An anti-abuse provision reduces the 50 percent control threshold to 5 percent if more than 50 percent of the share capital of the foreign entity is directly or indirectly held through French or foreign companies controlled by the French parent company (Orbitax, 2007).

According to Förster (2015), the first German CFC rules were similar to the U.S. Subpart F rules. Before these rules were enacted, profits of foreign companies were not taxed as income to their German shareholders unless distributed. As a result, German companies could defer German tax on the profits of their foreign subsidiaries and even avoid tax by moving parent companies out of the country (Weiss, 2015). Under the German regime, a CFC is a foreign company whose capital or voting rights are directly or indirectly majority-owned by German residents at the end of its fiscal year (the rules apply even when a partnership exists in the chain of companies). The rules apply if the company generates passive income and is taxed below the 25 percent threshold (Außensteuergesetz, Section 7). The effective rate is calculated as a ratio between the taxes levied in the residence state on the CFC's passive income and the CFC's

tax base determined under German tax law. The CFC is treated as a German company to calculate the ratio; the rule is applied if the foreign tax charge is less than 25 percent of the German charge. All the requirements must be met simultaneously (Deloitte, 2017).

Spain enacted its CFC regime in 1995 while significantly modifying its income tax rules. The primary purpose of the Spanish reform was to open the Spanish economy to foreign investment, something that increased significantly after the creation of the European Union in 1993. This contributed to political pressure supporting rules for taxing passive income shifted to low-taxed regimes (Dueñas, 2019). The Netherlands' corporate tax system (PwC, 2017) contains several features to attract investors. The country did not have a CFC regime until it was made mandatory by ATAD in 2019. Some of the features of the corporate tax regime in the Netherlands include a total participation exemption for capital gains and dividends, favorable tax regimes for patent income, investment vehicles, and the income derived from shipping activities. Also, there is no withholding taxation on interest or royalty payments made by the taxpayer (Deloitte, 2019).

Likewise, it should be considered that, in general, with foreign-controlled companies, the rules from ATAD apply with the beginning of application from 2019, which was preceded by the Council Directive (EU) 2016/1164 of July 12, 2016, which establishes rules against tax avoidance practices that directly affect the functioning of the internal market. This ensures that *de minimis* protection has been implemented in Croatian legislation, through the Corporate Income Tax Act, according to which the profit of a foreign-controlled company is included in the domestic tax liability.

4. CONCLUSION

The paper's main objective was to analyze the degree of convergence of CFC rules in the observed national EU frameworks within the last five years with the entry into force of the Council Directive (EU) 2016/1164. The following objectives were achieved through the paper: (i) the totality of CFC rules in 25 EU countries was defined – Appendix A; (ii) border issues that do not imply the application of CFC rules were investigated and presented – Appendix A; (iii) national substances justifying the exemption and exclusion of CFC rules

were researched and analyzed – Appendix A; and (iv) national tax rates broken down into three subgroups were analyzed.

Although the literature on income taxation does not emphasize the diversity of instruments for measuring the tax burden, developing measures against income tax avoidance gives new importance to these analytical tools. One is the rule on foreign-controlled entities as part of the OECD's broad BEPS package. The rule above was implemented in the member states through the EU Anti-Tax Avoidance Directive 2016/1164, where the primary purpose is to regulate tax avoidance, i.e., ensuring that a part (or the whole profit) is included in the tax base of parent companies without a formal payment or some other method of distribution of the realized profit. In doing so, it is possible to include in the tax base the entire profit of the foreign-controlled company or only those parts resulting from passive income/profit. Although the Directive itself provides different implementation options and the fact that different member states have implemented these provisions in different ways, one thing remains common.

Namely, the critical issue for applying the rules on foreign controlled entities relates to determining the effective tax burden of businesses in other jurisdictions and under the parent company's control. The comparison of the effective tax rate is a straightforward way of determining the tax burden. Although countries define the level of the minimum tax burden in different ways as the necessity that operations of a foreign-controlled company are not included in the domestic tax base, the basis is always the same – the ratio of the actual tax paid to the realized profit. The consequence of applying this is that if the foreign-controlled business does not pass the tax burden test, it is included in domestic taxation, more precisely, additional taxation. This results in an increase in the tax burden measured by the effective corporate tax rate. On the other hand, the result of the introduced measures is aimed at eliminating the effects of (aggressive) tax planning, which results in significant tax evasion and, thus, the loss of tax revenues for the budgets of individual countries.

The effective tax rate is becoming an increasingly important tool, whose users are not only taxpayers who are trying to optimize (minimize) the tax burden but also tax authorities for whom the effective tax rate is becoming a key instrument in the fight against corporate tax evasion.

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APPENDIX A. Application of CFC rules in EU countries

Country / Year	Definition of CFC	Substance requirements	Description of significant CFC exemption and exclusion requirements	Tax rate in %		
				Statutory corporate 2022	Effective average 2021	Effective Marginal 2021
Austria (2019)	If the taxpayer by itself, or together with its associated enterprises holds a direct or indirect participation of more than 50 percent of the voting rights, or owns directly or indirectly more than 50 percent of capital or is entitled to receive more than 50 percent of the profits of that entity (Art. 7 paragraph 1 ATAD); and the actual corporate tax paid on its profits by the entity or permanent establishment does not surpass 12.5%.	The CFC rules do not apply where the CFC carries on a substantive economic activity supported by staff, equipment, assets and premises, as evidenced by relevant facts and circumstances (Article 7 paragraph 2 point a ATAD). The exemption is applicable to CFC located in an EU-Member State as well as for CFC located in a third country that is not party to the EEA Agreement. Austria opted to implement the two exemptions stipulated in Article 7 paragraph 3 ATAD 1.		25	23.5	13.2
Belgium (2017)	A foreign company will be considered as a CFC if the following two conditions are simultaneously satisfied: - The control test: the Belgian taxpayer owns (directly or indirectly) the majority of voting rights of the foreign company, or has (directly or indirectly) a stake of at least 50% in the capital of this company, or is entitled to at least 50% of the profits of this company; and - The taxation test: in the country or jurisdiction where it is situated, the foreign company/PE is either not subject to income tax or subject to income tax less than half of the income tax if the company would have been located in Belgium. There is no substantial activity carve out. No limitation in function of the size of the participation. No foreign tax credit. But when the CFC distributes profits that have already been subject to tax at the level of the Belgian corporate shareholder, based on the Belgian CFC-rules, these profits shall be fully deducted from the recipient's tax base.			25	23.3	10.8
Czech Republic (2019)	Control test : 50% basis	Yes	Tax Rate Exemption: ETR 50% compared with Czech	19	18.3	13.1

Denmark (1995)	Under the Danish CFC legislation, a Danish resident parent company is liable to taxation of the income of a non-resident subsidiary or a foreign permanent establishment to the extent of its participation if: the Danish parent company directly or indirectly controls more than 50% of its voting power; more than 50% of the subsidiary's taxable income derives from CFC-income; and at least 10% of the subsidiary's assets are CFC-assets. The Danish rules are not subject to any substance test.	22	20	6.8
	An exemption from CFC taxation exists for intermediate local holding companies. In principle, transactions between a subsidiary resident in the same country and the intermediate holding company are disregarded.			
Estonia (2000)	As of January 1, 2019, there are two CFC rules in Estonia: 1) CFC rule from the ATAD Directive applicable to companies; 2) CFC rule applicable to natural persons. In case of ATAD CFC rule, CFC is defined as a permanent establishment or an entity if the taxpayer by itself, or together with its associated enterprises holds a direct or indirect participation of more than 50 percent of the voting rights, or owns directly or indirectly more than 50 percent of capital or is entitled to receive more than 50 percent of the profits of that entity. In case of CFC rule applicable to natural persons, a legal person is deemed to be controlled by Estonian residents if one or several legal or natural persons who are Estonian residents own at least 50 per cent of the shares, votes or rights to the profits of the legal person directly or together with associated persons. The income of a foreign legal person is deemed to be the taxable income of a resident natural person if the condition prescribed above is fulfilled and the resident owns at least 10 per cent of the shares, votes or rights to the profits of the legal person directly or together with associated persons. ATAD CFC rule applies only in case of CFC's income arising from non-genuine arrangements which have been put in place for the essential purpose of obtaining a tax advantage. An arrangement or a series thereof shall be regarded as non-genuine to the extent that the entity or permanent establishment would not own the assets or would not have undertaken the risks which generate all, or part of, its income if it were not controlled by a company where the significant people functions, which are relevant to those assets and risks, are carried out and are instrumental in generating the controlled company's income. In case of CFC rule applicable to natural persons, there is an exemption for a CFC if more than 50 per cent of its annual income is derived from actual economic activity or if the state or territory of location of the legal person provides the Estonian tax authority with information concerning the income of a person controlled by Estonian residents. ATAD CFC rule is not applicable to an entity or permanent establishment with accounting profits of no more than EUR 750 000, and non-trading income of no more than EUR 75 000. In case of CFC rule applicable to natural persons, CFC's income is taxed in Estonia if CFC is located in a low tax rate territory. A low tax rate territory is a foreign state or a territory with an independent tax jurisdiction in a foreign state, which does not impose a tax on the profits earned or distributed by a legal person or where such tax is less than one-third of the income tax which a natural person who is an Estonian resident would have to pay on a similar amount of business income. There is a white list of the jurisdictions that are not considered to be a low tax rate territory. This list includes all Estonian tax treaty partners.	20	17	0

Country	Description			
Finland (1995)	A foreign entity, provided that the requirements for ownership (at least 25 % by the taxpayer itself or together with associated enterprises) and low tax rate (the actual corporate tax paid by the foreign entity on its profits is lower than three fifth's of the tax that would've been payable on the same income according to Finnish corporate income tax rules) are fulfilled. CFCs which carry on a substantive economic activity supported by staff, equipment, assets and premises. For CFCs located in a non-EEA state, it is also required that Finland and the country in which the CFC is located have agreed on adequate exchange of information and that the CFC is engaged with production activity. The exclusion does not apply to CFCs located in a jurisdiction included in the EU list of non-cooperative jurisdictions for tax purposes.	20	19.8	15
France (1980)	The CFC rules requires, under some circumstances, the taxation in France, in the hands of a French corporation, of the profits of a foreign entity which it owns. There are both control and low taxation threshold requirements : -a French corporation falls within the scope of CFC if it owns directly or indirectly more than 50% of the share or voting rights of a foreign entity (company, subsidiary, branches, trust or comparable entities); This threshold is reduced to 5% when more than 50% of the shares, shares, financial rights or voting rights of the legal entity established or incorporated outside France are held by companies established in France which act in concert, when the foreign entity is listed on a regulated market, or by companies that are directly or indirectly placed in a situation of control or dependence with respect to the legal person established in France and the foreign entity benefits from a preferential tax regime in the foreign State. An entity is considered to benefit from a preferential tax regime if it is not taxable in that State or taxable at a level that is less than 40% or more than it would have paid under the French law if it had been located in France (the threshold of 40 % applies from the 1st of 2020, before that date the 50 % threshold applies. There are two series of exemptions: Inside the EU, the foreign entity established in a member State will not be subject to the CFC rules, unless the French tax authorities demonstrate that the foreign entity located in another EU country constitutes an artificial arrangement, set up to circumvent French tax legislation; -In other cases, if a French company falls within the scope of CFC, it can be exempted if it demonstrates that the operations of the entity established outside France are primarily intended to have an object and effect other than to transfer profits in a State or territory where it is subject to a preferential tax regime. This condition is deemed to be fulfilled when the entity established outside France has mainly an industrial/commercial activity. CFC rules, in principle, are not applicable with respect of foreign branches or subsidiaries located in another EU country. However, this exception is not applicable if the French tax authorities can demonstrate that the foreign entity located in another EU country constitutes an artificial arrangement, set up to circumvent French tax legislation. This concept is similar to the 'abuse of law' concept, although it does not have all the same characteristics.	25.8	25.9	8.5

Germany (1972)	German taxpayers have to hold more than 50 percent of the foreign companies shares. Thereby the size of the participation of each single shareholder is irrelevant. Section 8 paragraph 2 provides a so called motive test which allows the tax payer to prove that the company pursues an actual economic activity as far as the companies registered office is located in an EU-member State. For mixed income, the following rule is provided: "Section 9 - Tax threshold for mixed income When applying section 7 (1), income with respect to which a foreign company is an intermediate company is not taken into account if the gross proceeds underlying it amounts to no more than 10 percent of the company's total gross proceeds, provided that the amounts not taken into account for a company or a taxpayer under this provision do not exceed €80,000."	29.8	26.6	2.1
Greece (2014)	A CFC is a legal person or entity which is resident for tax purposes in another country if the following conditions are met cumulatively: a) if the taxpayer alone or jointly with the associated persons directly or indirectly holds shares, stakes, voting rights or participations in the capital exceeding fifty percent (50%) or is entitled to over fifty percent (50%) of the profit of that legal person or entity, b) if the above legal person or entity is subject to taxation in a non-cooperating state or a country with a preferential tax regime, i.e. a special regime allowing for a substantially lower taxation level than that under the general regime, c) if more than thirty percent (30%) of net income before tax realized by the legal person or entity falls into one or more certain categories defined in the very same article, d) the legal person or entity is not a company of which the main class of shares of which are traded on a regulated market. CFC rules do not apply in cases where the legal person or entity is resident for tax purposes in an EU member state, unless the establishment or financial activity of the legal person or entity constitutes a fictitious arrangement made essentially with the intention to avoid the applicable tax. In case the legal person or entity is resident for tax purposes in a country which is a party to the EEA agreement and an information exchange agreement is in force and implemented commensurate with the exchange of information upon request provided in Directive 2011/16/EU, CFC rules do not apply, unless the establishment or financial activity of the legal person or entity constitutes a fictitious arrangement made essentially with the intention to avoid the applicable tax.	22	21	14.2
Hungary (1997)	Applies a definition of CFC that also covers certain transparent entities i.e. a legal and economic control test for defining a CFC which means that controls more than half of its voting rights or its subscribed capital, or is entitled to more than half of its after-tax profit. A foreign person is not deemed a CFC if there is real economic substance (i.e. adequate personnel, equipment, assets, and location to effectively carry out business activities) attributable to that person. This condition is deemed to be fulfilled where the income from specified activities pursued with the entity's/PE's own assets and employees amount to at least 50% of its total income.	9	10.2	4.7
Iceland (2010)	A CFC is a non-resident company, fund, institution or other entity in a low-tax country that is at least 50% owned or controlled, directly or indirectly, by resident taxpayers. The CFC rules do not apply, if the controlled company (i) is resident in a treaty country and its income is not mainly financial income, or (ii) is resident in a country within the EEA and is engaged in business activities there and the tax authorities are able to request all necessary information according to an international treaty.	20	18.8	10.2

Ireland (2019) ATAD	A CFC is defined as a company resident outside of Ireland that is "controlled" by an Irish resident company. An Irish resident company is considered to have control of a non-resident subsidiary where (in broad terms) it has direct or indirect ownership of or entitlement to more than 50% of the share capital, voting power or distributions.	Ireland selected Option B in accordance with Article 7(2)(b) ATAD. The rules operate by attributing undistributed income of the CFCs, arising from non-genuine arrangements put in place for the essential purpose of avoiding tax, to the controlling company, or a connected company in Ireland, for taxation, where the controlling company or the connected company have been carrying out "significant people functions."	12.5	12.4	10.5
Italy (2001)	If a person resident in Italy (a legal entity, partnership, individual) holds, directly or indirectly, also through trust companies, the control of an enterprise, company or other entity, resident or located in States or Territories permitting privileged tax regimes, the income earned by the controlled foreign entity is imputed to the resident entity or person, as of the end of the fiscal year of the controlled foreign entity. The relevant control is based on the civil law, which is described in article 2359 Civil Code. Subsidiaries enterprises are: 1) companies in which another company has the majority of the votes that can be exercised in the general shareholders' meeting; 2) companies in which another company has sufficient votes to exercise a significant influence in the general shareholders' meeting; 3) companies that are under the significant influence of another company by virtue of particular contractual obligations with it 4). A tax regime is "privileged" where the nominal level of taxation is less than 50%. The Italian-resident taxpayer which controls the CFC could apply for a tax ruling claiming the non-application of the CFC rules. In case of non-UE resident CFCs the Italian-resident taxpayer, which controls the CFC, must give evidence that: - the CFC predominantly carries out, as its main business purpose, an industrial activity within the local market, i.e. within the market of the country where the company is located. The non-resident company must be economically and socially integrated in this market, and the presence of a real business or-ganisation in such market is not enough (c. 51/E/2010). For banks, financial institutions and insurance companies, this evidence is deemed to be given if most of the funds, investments, and proceeds arise from the jurisdiction where these entities are located; or - alternatively, the participation in the CFC does not achieve the result of shifting income to low-tax jurisdictions. In case of EU resident CFCs the Italian-resident taxpayer, which controls the CFC, must give evidence that: - the CFC does not represent a wholly artificial arrangement aimed at obtaining an undue tax advantage (see at Cadbury-Schweppes decision by EUCJ).	27.8	21.3	-30.4

		20	17	0
Latvia (2013) 2013 - for natural persons 2019 - for compa-nies	As of January 1, 2019, there are two CFC rules in Latvia. 1) CFC rule from the EU Council Directive 2016/1164 (ATAD) applicable to companies; 2) CFC rule applicable to natural persons. The CFC rule in the CIT Law (Article 61) provides the definition of non-genuine arrangements, participation threshold, and limitation to apply CFC rule. The CFC is defined as a permanent establishment or an entity if the taxpayer by itself, or together with its associated enterprises holds a direct or indirect participation of more than 50 percent of the voting rights, or owns directly or indirectly more than 50 percent of capital or is entitled to receive more than 50 percent of the profits of that entity. CFC rule applies only in case of CFC's income arising from non-genuine arrangements that have been put in place for the essential purpose of obtaining a tax advantage. An arrangement or a series thereof shall be regarded as non-genuine to the extent that the entity or permanent establishment would not own the assets or would not have undertaken the risks which generate all, or part of, its income if it were not controlled by a company where the significant people functions, which are relevant to those assets and risks, are carried out and are instrumental in generating the controlled company's income. The CFC rule in the PIT Law (effective starting from 2013) is applicable to natural persons (article 173 of the law in Personal income Tax) if at least 25% of a non-resident capital company (the stocks of which are not quoted in the regulated market of a European Union Member State or European Economic Area State), partnership or other legal person, a foreign foundation, trust or other legal entity set or established low tax or no tax countries and territories is owned or controlled, directly or indirectly, by resident taxpayers (individuals). In this case profits of such company, partnership, person, foundation, trust or entity, whether distributed or not, are attributed proportionately to their resident shareholders and taxed accordingly (under individual income tax). The list of low tax or no tax countries and territories is established by the Cabinet of Ministers (Paragraph 1 of the Regulations of the Cabinet of Ministers dated of November 7, 2017 (No. 655). The CFC rule in the CIT Law applies only in case of CFC's income arising from non-genuine arrangements which have been put in place for the essential purpose of obtaining a tax advantage. An arrangement or a series thereof shall be regarded as non-genuine to the extent that the entity or permanent establishment would not own the assets or would not have undertaken the risks which generate all, or part of, its income if it were not controlled by a company where the significant people functions, which are relevant to those assets and risks, are carried out and are instrumental in generating the controlled company's income. The CFC rule in the CIT Law is not applicable to an entity or permanent establishment with accounting profits of no more than EUR 750 000, and non-trading income of no more than EUR 75 000. However, this exclusion is not applicable for entity set or established in a low tax or no tax countries and territories.			

Lithuania (2004)	A CFC subject means: 1) a controlled foreign taxable entity; 2) a permanent establishment of a Lithuanian entity whose income is not attributable to the tax base of the Lithuanian entity. A controlled foreign taxable entity means a foreign entity where a Lithuanian entity alone or together with associated persons on the last date of the tax period of this foreign entity directly or indirectly owns more than 50 % of shares (interests, member shares), voting rights or rights to the share of distributable profits or exclusive rights to purchase them. The income of the CFC is taxed only if:1) a CFC is registered or otherwise organised in the target territory (blacklisted jurisdiction); or 2) passive income of the CFC exceeds 1/3 of total income of this CFC during the tax period; and 3) actual corporate income tax paid on income of the CFC following the rules on corporate income tax or equivalent tax applied in this foreign state is lower than 50 % of actual corporate income tax on income of CFC which would have been computed following the Lithuanian CFC rules. CFC income includes only passive income. CFC rules are not applied if (except for the CFC, registered or otherwise organised in the target territory (blacklisted jurisdictions)):- passive income of the CFC does not exceed 1/3 of total income of this CFC during the tax period; or- actual corporate income tax paid on income of the CFC following the rules on corporate income tax or equivalent tax applied in this foreign state is not lower than 50 % of actual corporate income tax on income of CFC which would have been computed following the Lithuanian CFC rules.	15	13.7	5.2
Luxembourg (2019)	A CFC is a foreign entity or foreign permanent establishment, the income of which is not taxable or is exempt in Luxembourg. In the case of a foreign entity, there must be a Luxembourg resident (either alone or with associated enterprises) that directly or indirectly holds more than 50% of the voting rights or capital, or is entitled to more than 50% of the profits. The income tax paid by the foreign entity or foreign permanent establishment must be lower than the income tax it would have paid on those profits if it were subject to tax in Luxembourg. The rules do not apply to a CFC that has profits that do not exceed €750,000 or do not exceed 10% of its operation costs in the period.	24.9	23.2	11.9
Netherlands (2007)	Control (>50%) — substantive economic activity supported by staff, equipment, assets and premises / list of low tax jurisdictions	25.8	23.7	14.2
Norway (1992)	Control criteria: 1. There is deemed to be Norwegian control of a foreign company or undertaking if no less than one half of the ownership interests or capital of such company or undertaking are directly or indirectly owned or controlled by Norwegian taxpayers, at both the beginning and the end of the tax year. 2. There is also Norwegian control if the company or the undertaking were deemed to be Norwegian-controlled in the year before the tax year, unless less than one half of the ownership interests or capital are directly or indirectly controlled by Norwegian taxpayers, at both the beginning and the end of the tax year. 3. If Norwegian taxpayers own or control more than 60 percent of the ownership interests or capital as at the end of the tax year, there is Norwegian control irrespective of 1 and 2. Correspondingly, there is not Norwegian control if Norwegian taxpayers own or control less than 40 percent of the ownership interests or capital as at the end of the tax year. Low-tax jurisdictions: Low-tax jurisdictions are jurisdictions in which the ordinary income tax on the overall profit of the company or undertaking is less than two thirds of the tax that would have been levied on such company or undertaking if it had been resident in Norway. The Norwegian tax rate in 2018 is 23 pct.	22	21	13.9

Poland (2015)	In the case of the Polish CFC rules, in principle, control is not defined directly, but an indication of its meaning can be gleaned from the first (of three) conditions for constituting a CFC. The CFC rules refer to the 50 per cent control threshold and say that a Polish taxpayer controls a foreign company if he owns continuously for at least 30 days, directly or indirectly, at least (i) 50 per cent of the company's capital (legal control); (ii) 50 per cent of the voting rights in the controlling or administrative organs of the company (legal control); or (iii) 50 per cent of the shares related to the right to participate in the company's profits (economic control). Moreover, a foreign company whose tax residence is in one of the 26 tax havens is considered a CFC regardless of the level of control over this company, level of taxation of its profits, or type of income received by it (CFC presumption). The Polish CFC rules apply also to the foreign permanent establishment of a Polish taxpayer. The Polish CFC rules do not apply to a non-resident company if the non-resident company is established and subject to tax on the worldwide income in a EU/EEA country, provided it meets the substantial genuine business activity test. When assessing whether a CFC carries out a genuine economic activity, the Polish CFC rules recommend paying particular notice to whether: (i) the registration of a CFC matches an actual establishment intended to carry on genuine economic activities, i.e. the company has local, qualified personnel and the requisite equipment; (ii) a CFC has been created as a structure functioning in isolation for economic reasons; (iii) the premises, personnel or equipment of a CFC are commensurate with the scope of its activities; (iv) arrangements concluded by the CFC are consistent with economic reality, have an economic justification, and are not manifestly contrary to the general economic interests of the company; and (v) a CFC independently performs its basic economic functions with the use of its own resources, including managers at the company's location. Beyond the above described exemption, there is no exemption or exclusion from the Polish CFC rules. However, low actual tax paid by a CFC may be considered as a kind of exclusion from the Polish CFC rules - the tax actually paid by the CFC is lower than the difference between the corporate income tax that would have been charged on the CFC under the Polish tax system and the actual corporate income tax paid by the CFC. For example, if the CFC actually paid more than 9,5 per cent of tax (50% of the Polish 19% ordinary tax rate for corporate taxpayers), while the corresponding Polish company would have been paid 19%, then the CFC's is excluded from the taxation under the Polish CFC rules (in fact such company would not be considered as a CFC because it will not meet on of the three conditions to become a CFC.	19	15.5	-5.8

Portugal (1995)	Portuguese definition of CFC (see article 66, CITC): Profits or incomes of non-residents in Portugal and submitted to clearly more favourable tax regime are treated (with appropriate deductions) as profits or incomes of companies with residence in Portugal that, directly or indirectly, have at least 25% of capital, voting rights, rights on profits or incomes or rights on assets of said non-residents companies. A non-resident company is considered submitted to a clearly more favourable tax regime if the residence jurisdiction is by law considered has such or if that company pays an effective CIT or equivalent lower than 50% of the Portuguese one. Portuguese CFC rule is excluded if CFC undertakes substantial activities (agriculture or industry or, not predominantly in Portugal, commerce or services), being such activities the cause of at least 75% of his profits or incomes, and if in the CFC main activity are not included some well described operations, as credit, financial, insurance, holding and lease of goods ones with personnel, equipment, actives and installations. The CFC Portuguese rule is not applicable to non-resident companies of other EU member states or EEA member states. In this last case, the exemption operates only if the member state complies with administrative tax cooperation similar to the one of the EU and the taxpayer demonstrates that his company is submitted to valid substantive economic reasons and develops agricultural, industrial, commercial or services economic activities.	31.5	25.1	-22.8
Slovak Republic (2018) with effect in 2019	The control test is in line with the Article 7(1) of the EU Anti-Tax Avoidance Directive 2016/1164 (ATAD). The control test for a control foreign company is as follows [ITA Sec. 17h para 1 letter a)]: a corporate taxpayer (tax resident of the Slovak Republic) by itself, or together with its associated enterprises owns directly or indirectly more than 50% of the capital or holds a direct or indirect participation of more than 50% of the voting rights or is entitled to receive more than 50% of the profits of the foreign entity. Other condition, which has to be fulfilled is a tax rate test, i.e. the corporate tax paid by the controlled foreign company abroad is lower than the difference between the corporate tax of the controlled foreign company calculated under the Slovak Income Tax Act and the corporate tax paid by the controlled foreign company abroad [ITA Sec. 17h para 1 letter b)]. As the controlled foreign company is considered also the permanent establishment [ITA Sec. 17h para 3].	21	19.3	8.6
Slovenia (2019)	CFC rules will generally apply if: taxpayer directly or indirectly holds more than 50% of capital or voting rights or an entitlement to the profits of a foreign entity, which is not subject to tax under CITA and foreign entity's tax paid is less than 50% of the tax that would have been paid under Slovenian CITA. Exceptions are determined for CFC that carries on a substantive economic activity and in cases, where one third or less of the income accruing to the CFC falls within the determined categories of income.	19	17.5	7.9
Spain (1995)	The taxpayer by itself, or together with its associated enterprises holds a participation equal or more than 50 percent of capital, voting rights or outcome. Also the actual corporate tax paid on its profits by the entity is lower than a 75 percent of the corporate tax that would have been charged on the entity under the corporate tax system of Spain. There are exclusions based on substantial activities and reasonable reasons for establishing in a country. An entity would not be treated as a controlled foreign company if the amount of the income that falls within CFC rules is lower than the 15 percent of the total amount of incomes.	25	23.3	11.9

Sweden (1989)	CFC rules apply to resident companies and individuals, as well as any non-resident with a PE in Sweden, with a direct or indirect 25 % holding or control, by the taxpayer alone or together with associated persons, of capital or voting power in a foreign legal entity. The rules contain a substance exclusion as from 1.1.2008, to be in line with the ECJs Cadbury judgment. This exemption from the general rule applies to income from a foreign legal entity that is resident within the European Economic Area (EEA), if the shareholder can prove that the foreign entity is established in the other country for business reasons and is engaged in real economic activities. Under the general rule, the income of a controlled foreign entity is deemed to be subject to low taxation if it is not taxed at all or is subject to tax that is lower than 12,1% (55% of the Swedish tax rate of 22% for income year 2018). However, income is not considered to be subject to low taxation if the foreign legal entity is a tax resident, and liable to income tax, in one of the countries listed in a white list, provided that the income in question has not been expressly excluded in the list. In addition, the CFC regime does not apply to income derived from a foreign legal entity engaged in international shipping activities, provided that also the shareholder is engaged in shipping activities, whether directly or indirectly through a legal person resident in the EEA	20.6	19.7	12.7
Romania (2018)	An entity shall be treated as a controlled foreign company if the following conditions are cumulatively met: a) the taxpayer, alone or together with its associated enterprises, holds a direct or indirect holding of more than 50% of the voting rights or directly or indirectly owns more than 50% of the capital of the entity or is entitled to receive more than 50% of that entity's profits; b) the tax on profits actually paid for its profits by the entity or permanent establishment is less than the difference between the profit tax that would have been levied from the entity or the permanent establishment, calculated in accordance with the provisions regarding to the tax on profit from Fiscal Code of this Title and the profit tax actually paid for its profits by the entity or by the permanent establishment. For the purposes of this letter, the permanent establishment of an entity treated as a foreign controlled company shall not be taken into account in so far as the head office is not subject to taxation or is exempt from tax in the jurisdiction of the controlled foreign company. The provisions of CFC rules shall not apply if the controlled foreign company has its fiscal residence or is located in a Member State / third country which is a party to the EEA Agreement and carries out a significant economic activity, supported by personnel, equipment, assets and spaces, as evidenced by the relevant facts and circumstances. The following shall not be considered controlled foreign companies according to the provisions of the law: a) the entity or the permanent establishment, if this registers in a fiscal period incomes from the categories mentioned by the law, representing one third or less than one third of the total incomes recorded in the calculated fiscal period; b) the financial enterprise which records in a fiscal period incomes of the nature provided in the law arising out of operations performed with the Romanian taxpayer or its associated enterprises, representing one third or less than one third of the total incomes registered by the financial undertaking.	16	14.4	4.3

THE EFFECT OF BUSINESS INTELLIGENCE ON CONTROLLERS' OUTPUT QUALITY AND DECISION-MAKING

Antonija PETRLIĆ, Ph.D.
University of Rijeka, Faculty of Economics and Business

E-mail: antonija.petrlic@efri.hr

Abstract

This paper examines the relationship between business intelligence, controllers' output quality, and controllers' involvement and impact on decision-making. The aim was to prove that business intelligence capability positively relates to controllers' output quality. Thus, the controllers' output quality is positively related to the degree of their involvement in decision-making and, consequently, to the efficiency of managers in decision-making, i.e., to their net benefit. Partial least squares structural equation modeling (PLS-SEM) was used for 100 controllers surveyed among large and medium-sized Croatian companies. The results indicate that business intelligence capability, regarding workflow support and functionality, is positively related to controller output quality and that controller involvement in decision-making and the resulting impact on decisions are positively related to output quality. The main limitation of this study is the non-involvement of managers. Further research should test the model against managers' responses, particularly concerning the quality of outputs and the net benefits they derive from controllers' involvement in decision-making. This research should raise awareness of the importance of the controller profession by confirming the significance of controllers' involvement in decision-making, but also the importance of business intelligence, without which the execution of controllers' activities is almost unthinkable today.

Keywords: *business intelligence capability, controllers' output quality, controllers' involvement, decision-making.*

JEL Classification: *M49, M21*

1. INTRODUCTION

The digital environment makes it possible to have a large amount of information. Therefore the success of companies depends more than ever on making the right decisions based on high-quality information. That is, companies' success significantly depends on the quality of data processing to obtain quality information used in the business decision-making process. Given the growing amount of data companies have at their disposal and the benefits and challenges that this data brings, functions need to help managers make more efficient decisions. As an advisory function, controlling provides appropriate information to decision-makers (Vitezić & Lebefromm, 2019). That is, in line with the growing need for management advisory functions, controllers have become "business partners" of managers (Oesterreich & Teuteberg, 2019; Schäffer & Brückner, 2019), whose role is to provide managers with quality analysis, reports, and suggestions, i.e., outputs. Of course, the impact of these outputs depends on the degree of the controllers' involvement in decision-making. That is, it depends on the manager's acceptance of the controllers' profession (Osmanagić Bedenik, 2018; Spillecke, 2006; Wolf et al., 2015) but also on the willingness of controllers to participate in the decision-making process (Wolf et al., 2015). Only involved controllers can influence managers' decisions. Thus, managers will involve controllers in decision-making if they provide adequate quality outputs. The quality of the outputs will depend to some extent on the manager's acknowledgment of the controllers and, for sure, on the skills and knowledge of the controllers gained through experience and education. However, considering today's digital and big data environment, great emphasis on decision-making and, thereby, the execution of controller activities is placed on Business Intelligence (BI) systems, their functionalities, futures, customizability, efficiency, level of use, etc. (Appelbaum et al., 2017; Gullkvist, 2013; Kulkarni et al., 2017; Richards et al., 2019; Wieder & Ossimitz, 2015).

While there are empirical studies that examine the impact of BI on controlling (Bao et al., 2023; Gullkvist, 2013; Järvenpää et al., 2023), they are mostly limited to theoretical models and recommendations for researchers (Appel-

baum et al., 2017; Rikhardsson & Yigitbasioglu, 2018). In other words, most empirical studies examining the impact of BI's system functionality have been conducted in the field of informatics and business decision-making research, which do not consider the role and importance of the controller. Also, no research has been found that examines the influence of BI capability on the controllers' output quality.

Therefore, this paper aims to examine the relationship between business intelligence capability and controllers' output quality, the relationship between controllers' output quality and controllers' involvement in decision-making, and the resulting impact on managers' net benefits in terms of more efficient, better, and faster decision-making. For this purpose, a survey was conducted among the Republic of Croatia controllers. Partial least squares structural equation modeling (PLS-SEM) was used for the statistical analysis of the model.

This study contributes to understanding the importance of controllers' involvement in decision-making, emphasizing the net benefits managers derive from using controllers' outputs. Thus, it sheds light on the importance of business intelligence (BI) capacity in controllers' output creation.

The paper is structured as follows. After the introduction, the second chapter presents a literature review on the relationship between business intelligence capacity, controllers' output quality, their involvement in decision-making and their effect on managers in decision-making. Chapter three provides the study's methodology, including sample description and the specification of the measurement variables. Chapter four presents the study's results, and chapter five discusses and concludes with limitations and suggestions for further research.

2. LITERATURE REVIEW

As noted earlier, most empirical studies examining the effects of BI do not consider the controllers' relationship. However, they do consider their effects on information quality and decision-making. For example, Wieder and Ossimitz (2015) confirmed the indirect relationship between information quality and decision-making through the indirect connection of BI management. Richards et al. (2017) confirmed an indirect relationship between BI effectiveness, defined as the degree to which the BI system delivers what it is supposed to deliver (business process management, dashboarding databases and online

reports), and process effectiveness, including quality management effectiveness. However, in terms of controlling, Gullkvist (2013) confirmed the impact of BI use on data quality and controller tasks. The research confirmed that using BI impacts effectiveness and change in controller practices, where effectiveness was defined as the decision-maker's perception of whether the information provided to them through reporting and budgeting meets their requirements (Nicolaou, 2000). Based on the findings, Gullkvist (2013: 166) emphasizes that "future research should explore the effects of BI tools in more detail to understand better how the BI tools would best benefit the accountants' tasks and accounting function overall." Järvenpää et al. (2023) emphasize that companies' controllers give sense to the information provided by the BI systems. This aligns with Gärtner and Hiebl (2018) stating that human "wisdom" is still needed to question the critical relevance of gathered data and information. So, scarce research exists in controlling deals with BI in terms of its use and defined as a data, i.e., input provider. BI systems are primarily designed to analyze, report, and present data previously stored in a data warehouse (Manyika et al., 2011), and their use in the day-to-day work of controllers is hardly questioned today. Therefore, a focus should be on the maturity and capability of BI systems, i.e., their relationship to controllers' work, weighted by their outputs and impact on decision-making. Although no research precisely addresses this exacta relationship, information science studies (Popovič et al., 2010, 2012; Sparks & McCann, 2015) recognize the importance of BI capability, i.e., maturity, and its relation to decision-making and data and information quality, which can be equated with the controllers' output quality. Therefore, a focus should be on the maturity and capability of BI systems, i.e., their relationship to controllers' work, weighted by their outputs and impact on decision-making. Although no research precisely addresses this exacta relationship, information science studies (Popovič et al., 2010, 2012; Sparks & McCann, 2015) recognize the importance of BI capability, i.e., maturity, and its relation to decision-making and data and information quality, which can be equated with the controllers' output quality. Controllers' outputs are a set of quality data, and information controllers make sense to provide to managers so they make good decisions. BI systems help them provide real-time data and the best possible function regarding data consolidation, analysis, visualization and report delivery.

Weißenberger and Angelkort (2011) examined the influence of the integration level of accounting systems on the controllers' output quality and the

impact of output quality on management decisions. The relationship between the controllers' output quality and the controllers' impact on management decisions was defined as controllership effectiveness, where the controllers' impact on management decisions represents the controllers' involvement in decision-making. That is, it is measured by the importance of the role controllers play in the decision-making process, the value managers place on controllers' opinions, and the extent of their influence on management decisions. Sathe (1982) emphasizes that the level of controllers' involvement in decision-making depends on various characteristics of the controllers, the managers, the company, and the environment. He defines controller involvement as the extent to which controllers perform various roles in managerial decision-making. Accordingly, Weißenberger and Angelkort (2011) proved that accounting systems, as an essential company characteristic in controllers' daily work, influence their effectiveness, i.e., their quality and impact on decision-makers. Using a slightly different approach, namely applying "The DeLone and McLean Information System Success Model" to controlling practice, which is commonly used to measure the success of information systems, Fadhilah et al. (2015) confirmed that there is a positive relationship between the quality of information that controllers provide to managers and manager satisfaction and that there is a positive relationship between manager satisfaction and the net benefits that managers derive from using the information provided by controllers. Net benefits result from the business partner relationship between controllers and managers, as measured by managers' more effective daily work and better and more efficient decision-making. A prerequisite for achieving net benefits is the manager's satisfaction with the information received, i.e., outputs, which will motivate him or her to seek and use the controllers' help more often. The quality of information, according to other research (Byrne & Pierce, 2007; Pierce & O'Dea, 2003; Wixom & Todd, 2005), is defined as relevant, accurate, complete, and formatted reports. Thus, the managers' satisfaction can be identified as the controllers' involvement. Fadhilah et al. (2015) defined it as the managers' satisfaction with the controllers' performance and, more importantly, the manager's willingness to interact more with controllers. Upon the initial literature review, the following hypotheses are proposed:

H1: A positive and significant relationship exists between business intelligence capability and controllers' output quality.

H2: A positive and significant relationship exists between controllers' output quality and controllers' involvement in decision-making.

H3: There is a positive and significant relationship between controllers' involvement in decision-making and managers' net benefit.

Based on the defined hypotheses and the set aim of this study, the following research model is proposed (Figure 1).

Figure 1. Research model and hypotheses
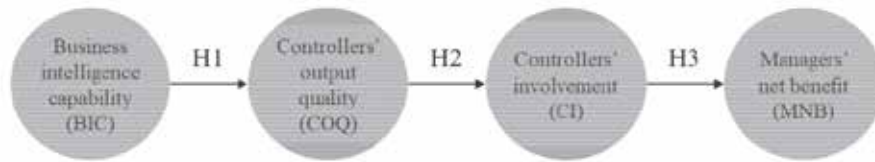
Source: Author

3. METODOLOGY

3.1. Data collection

Data for this study were collected using a questionnaire that was shared publicly via LinkedIn and additionally sent personally via e-mail to controllers whose contact was known to the author and via LinkedIn to those with an active position in Controlling their LinkedIn profile. One hundred responses were obtained and used for data analysis, thus meeting the required sample size for PLS-SEM analysis according to the so-called 10-times rule (Hair et al., 2017).

3.2. Measurement of variables

This study includes four latent variables measured with validated instruments from previous studies, with some minor item adjustments. All variables were measured on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Business intelligence capability (BIC) was measured using an instrument adapted from Kulkarni et al. (2017). Thus, a shortened version of a 2-item instrument was used.

Controllers' output quality (COQ) was measured using a measurement scale adopted from Weißenberger and Angelkort (2011) and Wixom and Todd (2005). A 7-item instrument assessed the quality of output controllers provided to managers for decision-making.

Controllers' involvement (CI) in decision-making was measured with a 6-item instrument, which is a version of the instrument by Weissenberger and Angelkort (2011), extended according to Nitzl and Hirsch (2016) and Wolf et al. (2015).

Managers' net benefit (MNB) was measured with a 3-item slightly modified instrument from Fadhilah et al. (2015).

All contract items are presented in Table 1.

Table 1. Constructs and items

Construct	Item Code	Item
Business intelligence capability	BIC1	BI systems support workflow.
	BIC2	BI systems have needed features/functionality.
Controllers' output quality	COQ1	My outputs reflect a high level of usefulness, explanatory power, and content.
	COQ2	My outputs are very precise.
	COQ3	My outputs are up to date.
	COQ4	My outputs contain correct data/information.
	COQ5	My outputs are clearly presented.
	COQ6	My outputs are aligned.
	COQ7	My outputs contain most relevant information.
Controllers' involvement	CI1	I play a very important role in the decision-making process of my organization.
	CI2	Management sets a high value on my opinion in the decision-making.
	CI3	I have a strong influence on management decisions.
	CI4	Before making important decisions, the management always consults me.
	CI5	I actually participate in the decision-making of general managers.
	CI6	I consider myself co-responsible for decision-making.
Managers' net benefit	MNB1	Managers are more effective in daily work.
	MNB2	Managers make better and more precise decisions.
	MNB3	Managers make decisions more quickly.

Source: author

4. RESULTS

The results of the demographic profile of the respondents were summarized as shown in Table 2. The majority of the sample includes controllers working in manufacturing companies (43%), followed by wholesale and retail trade, repair of motor vehicles and motorcycles (21%), accommodation and food service activities (10%), information and communication (9%), etc. There were more female (59%) than male (41%) controllers, and the majority were between 30 and 45 years old (61%). In terms of educational level, most of them have a master's degree (66%). No controller held a Ph.D. degree, but 19 finished an MBA study, and 10 have a master's in science. Thus, regarding work experience in controlling, the fewest respondents have less than five years (27%), while most have more than 10 (37%) and between 5 and 10 years (36%) of experience.

Table 2. Profile of respondents

Demographic variable	Category	Frequency
Type of organization (NACE Code)	Manufacturing	43
	Wholesale and retail trade; repair of motor vehicles and motorcycles	21
	Accommodation and food service activities	10
	Information and communication	9
	Professional, scientific and technical activities	4
	Transportation and storage	1
	Construction	3
	Human health and social work activities	1
	Agriculture, forestry and fishing	2
	Other service activities	1
	Electricity, gas, steam and air conditioning supply	1
	Water supply; sewerage, waste management and remediation activities	1
	Financial and insurance activities	3
Gender	Female	59
	Male	41
Age	< 30 years	12
	30 – 45 years	61
	> 45 years	27
Education level	High school	2
	Bachelor's degree	3
	Master's degree	66
	MBA	19
	Master of Science	10
Work experience in controlling	< 5 years	27
	5 – 10 years	36
	> 10 years	37

Source: author

Table 3 provides summary statistics for all constructs and items. Generally, it can be seen that controllers rate the capability of BI tools very highly (mean scores 6.070 and 6.110). Thus, they consider that the BI tools provide almost all the functions required for their daily workflow. They also rate the quality of their outputs very highly (mean scores between 6.020 and 6.340), partly due to the capability of the used BI tools. As for the controllers' involvement (mean scores between 4.690 and 6.100) and their impact on decision-making regarding managers' net benefit (mean scores between 4.678 and 5.930), the results show high to very high levels. Thus, controllers believe that managers mostly make better and more precise decisions through their involvement in decision-making and quicker decisions. Thus, controllers have a high opinion regarding their role in their organization's decision-making process.

Table 3. Descriptive statistics

Construct	Item code	Mean	Min	Max	Standard deviation
BIC	BIC1	6.070	4.000	7.000	0.711
	BIC2	6.110	4.000	7.000	0.691
COQ	COQ1	6.180	4.000	7.000	0.779
	COQ2	6.340	5.000	7.000	0.636
	COQ3	6.300	5.000	7.000	0.592
	COQ4	6.260	5.000	7.000	0.642
	COQ5	6.290	5.000	7.000	0.621
	COQ6	6.020	4.000	7.000	0.748
	COQ7	6.170	4.000	7.000	0.801
CI	CI1	6.100	4.000	7.000	0.768
	CI2	5.410	2.000	7.000	1.141
	CI3	5.350	2.000	7.000	1.178
	CI4	4.960	2.000	7.000	1.248
	CI5	4.690	1.000	7.000	1.521
	CI6	4.700	1.000	7.000	1.526
MNB	MNB1	4.678	1.000	7.000	1.672
	MNB2	5.930	3.000	7.000	1.012
	MNB3	5.710	3.000	7.000	1.003

Source: author

As Hair et al. (2017) noted, PLS-SEM is highly recommended for explanatory research and allows the analysis of small sample sizes. Thus, Ghasemi et al. (2016: 284) emphasize that it" is instrumental in areas where there is weak theory and limited understanding of relationships among variables." There-

fore, PLS-SEM was applied in this study, i.e., the analysis was conducted using SmartPLS4 software.

4.1. Measurement Model

The analysis of the measurement model considers the assessment of the reliability and validity of the indicators and constructs. More precisely, it includes the analysis: indicator reliability, convergent validity, internal consistency, and discriminant validity. Table 4 shows the assessment results of the models' indicators and constructs. The outer loading show that all the reflective indicators are above the suggested threshold of 0.70 (Hair et al., 2017), confirming their reliability and validity. In order to confirm the internal consistency reliability of the constructs, Cronbach's alpha (α) and composite reliability (CR) were computed. According to Hair et al. (2017), both measures have a threshold of 0.70. Thus, the result (Table 4) confirms that all constructs have acceptable reliability, with α and CR more significant than 0.90 for all constructs. The results also show adequate convergent validity because the average variance extracted (AVE) for all constructs exceeds the threshold of 0.50 (Hair et al., 2017), ranging from 0.645 to 0.917.

Table 4. Measurement model results

Construct	Item code	Loading	Cronbach's Alpha	Composite reliability	AVE
BIC	BIC1	0.968	0.911	0.957	0.917
	BIC2	0.948			
COQ	COQ1	0.756	0.911	0.927	0.645
	COQ2	0.817			
	COQ3	0.770			
	COQ4	0.729			
	COQ5	0.841			
	COQ6	0.858			
	COQ7	0.842			
CI	CI1	0.902	0.940	0.952	0.767
	CI2	0.932			
	CI3	0.903			
	CI4	0.898			
	CI5	0.862			
	CI6	0.744			
MNB	MNB1	0.906	0.922	0.950	0.865
	MNB2	0.937			
	MNB3	0.947			

Source: author

In PLS-SEM analysis, discriminant validity is typically assessed with the so-called Heterotrait–Monotrait (HTMT) criteria. HTMT values above 0.85 (or 0.90) indicate that discriminant validity has not been established (Hair et al., 2017; Henseler et al., 2015). Results in Table 5 shows that all constructs have HTMT value under the set threshold, ranging between 0.176 and 0.419. That is, all constructs of the measurement model have discriminant validity.

Table 5. HTMT results

Construct	BIC	COQ	CI	MNB
BIC				
COQ	0.200			
CI	0.186	0.267		
MNB	0.176	0.419	0.335	

Source: author

4.2. Structural Model

Evaluation of the structural model includes collinearity analysis within the structural model, hypotheses testing, and the assessment of the model's predictive ability.

Collinearity is analyzed using the inner Variance Inflation Factor (VIF). The model in this study meets the collinearity criteria, i.e., all VIF values are 1.000 and meet the established threshold of VIF values >0.2 and < 5.0 (Chin et al., 2003; Hair et al., 2019; Kock, 2015).

To test the hypotheses, we used the so-called bootstrapping technique, i.e., Bias-Corrected and Accelerated (BCa) bootstrap with 5000 subsamples (two-tailed; $p \leq 0.05$). Figure 2 shows the test results, where each arrow between two constructs represents a hypothesis with standardized beta values (β) of the path coefficients and p-test values. Concerning the BIC and COQ construct path, the beta-coefficient is positive and statistically significant (H1, $\beta=0.212$, $p=0.032$, $t=2.146$), supporting the established hypothesis H1. Also, the paths from the COQ construct to the CI construct (H2, $\beta=0.278$, $p=0.001$, $t=3.297$) and from CI to MNB construct ($\beta=0.339$, $p=0.000$, $t=4.501$) were found to be positive and statistically significant. That is, the results also support the set hypotheses H2 and H3.

Figure 2. Results of hypotheses testing
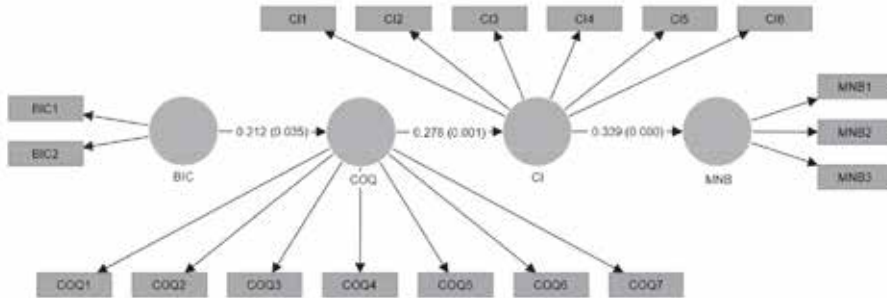
Source: Author

The predictive ability of the model was evaluated using the coefficient of variation (R^2), the effect size (f^2), and the Stone-Geisserov Q^2 indicator (Omission Distance=7). The results (Table 6) show the model's weak in-sample but significant out-of-sample predictive ability. According to the thresholds established by Cohen (1988), $f^2 \rightarrow 0.02$, 0.15 and 0.35 and $R^2 \rightarrow 0.02$, 0.13 and 0.26; weak, moderate and strong effect sizes, the results show a weak in-sample predictive power. On the other hand, Stone-Geisserov Q2 values greater than zero indicate that a model has out-of-sample predictive power, that is, predictive power concerning its endogenous constructs (Hair et al., 2017). All three endogenous constructs in this study have values greater than zero, confirming the model has predictive significance.

Table 6. Predictive relevance test results

Constructs relation	f²	Construct	R²	Stone-Geisserov Q2
BIC – COQ	0.047	COQ	0.045	0.017
COQ – CI	0.084	CI	0.077	0.050
CI – MNB	0.130	MNB	0.115	0.084

Source: author

5. DISCUSSION AND CONCLUSION

The controller profession, i.e., its role and importance in decision-making, is increasingly recognized in practice and academic circles. However, there is still a lack of empirical research, especially regarding the relationship between digitalization and the efficiency and effectiveness of controllers in the decision-making process. This study's results confirm a positive relationship between digitalization in controlling in terms of BI capability and the quality of the controllers'

analyses and reports. That is, the study confirmed that BI systems that support the workflow of controllers and have all necessary futures and functionalities will have a positive and significant impact on the efficiency of controllers, i.e., on their ability to transform various data and information into high-quality outputs (analyses, reports, suggestions). Moreover, this research has confirmed that the involvement of controllers in decision-making depends on the quality of the outputs. Only precise outputs, aligned, clearly presented and contain the most relevant information will ensure the controller's business partner role. This is to be expected. Even managers who recognize the controller's profession and its importance in decision-making will not set a high value on his or her opinion if the outputs do not reflect the expected quality. Only quality outputs will strongly influence management decisions, and only controllers who deliver such outputs will be seen as co-barriers to decision-making and, consequently, will impact the net benefit managers gain from involving controllers in the decision-making process. It can be concluded that effective controllers help managers to be more effective in their daily work, to make better and more precise decisions, and to make them quickly. Thus, an effective controller makes a more effective manager.

The main limitation of this study is the group of respondents. Only controllers were interviewed. For further research, it is suggested that the proposed model be tested using managers' perceptions, except for the variable BI capability. Controllers are assumed to have a better understanding of the capabilities of BI systems because they use them regularly. However, the common method bias could be significantly reduced if managers rated the quality of the output and gave their opinion on the degree of controller involvement in the decision-making process and the net benefit they receive from using their outputs. In addition, other researchers could extend the study to other countries or conduct it in individual industries to identify differences in the degree of controller involvement in decision-making. Since digitalization and using tools are essential for efficient control, future research should include more BI capability features, business analytics, and Big Data. This study confirms the importance of controllers in the decision-making process and the significant impact of BI tools on the effectiveness of controllers in this process.

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THE IMPACT OF THE COVID-19 PANDEMIC ON REVENUES AND PROFITS OF COMPANIES IN THE REPUBLIC OF CROATIA - SECTORAL ANALYSIS

Mladen RAJKO, Ph.D.
University of Zadar, Department of Economics

E-mail: mrajko@unizd.hr

Aleksandra KRAJNOVIĆ, Ph.D.
University of Zadar, Department of Economics

E-mail: akrajnov@unizd.hr

Ivica ZDRILIĆ, Ph.D.
University of Zadar, Department of Economics

E-mail: izdrilic@unizd.hr

Abstract

In 2020 and 2021, the COVID-19 pandemic affected various economic trends and changes in the business environment. The pandemic affected individual economic sectors differently, and the purpose of this paper was to collect, analyze and compare indicators of income and profit in companies in various sectors in the Republic of Croatia. The work used the classic method of collecting financial data (online services where the necessary relevant financial indicators are available), which were analyzed scrupulously throughout the paper. After detailed processing of the data, we came to different insights that the COVID-19 pandemic did not equally affect all business sectors in the Republic of Croatia, namely, which sectors were affected more and which less. Such conclusions are the basis for future research related to the emergence of various pandemics in society, as well as a helpful database intended to prevent possible business risks due to the emergence of a new pandemic in the future. The

results of the research will be able to help experts predict likely economic trends in individual economic sectors in the event of the emergence of new pandemics.

Keywords: *COVID-19, comparison of indicators, economic sectors*

JEL Classification: *M40, H27*

1. INTRODUCTION

The global crisis stirred by the pandemic of COVID-19 virus caused a substantial impact on the global and domestic economy in a very short time, producing a decline in the activity of the integral economic system. The CO-VID-19 pandemic is one of the worst in history due to its significant impact on the economies of many countries, including the economy of the Republic of Croatia. The outbreak of the COVID-19 pandemic at the beginning of 2020 created a significant health and economic crisis that the Republic of Croatia is still facing today. The pandemic continues to represent a significant threat to the economy of the Republic of Croatia, so it is necessary to study it for this reason. The crisis caused by the COVID-19 pandemic has also significantly affected the main economic branches of the Republic of Croatia. The closing of borders, restriction of freedom of movement, closure of factories, and suspension of business have hit tourism and industrial production the most, which bring the most income to the Republic of Croatia. Although the pandemic appears to be a threat to Croatian tourism, the paper aims to clarify how much of a threat this pandemic is and how much of an opportunity for Croatia to make more effective advances in specific business sectors.

This research aims to analyze the impact of the COVID-19 pandemic on the economy of the Republic of Croatia by individual sectors. In order to influence the improvement of the existing situation during the pandemic outbreak, the state adopted a series of economic measures to mitigate and eliminate negative economic consequences, which are analyzed in the paper. The paper explains how these measures work and whether they contribute to improving the economic situation in which the domestic economy finds itself. Monetary and fiscal policy measures should assume the leading role in such crises, and the European recovery plan is essential. Given that the pandemic is not slowing down and there is a possibility of a new wave of the virus, the goal is to explain how the Republic of Croatia can defend itself against a new shock, that is, which

measures and aspects of the economy should be focussed on to respond adequately to the COVID-19 pandemic.

In preparing this work, the analysis of the existing available data from public services in the Republic of Croatia, where financial indicators for all companies over the years are published, was mainly used. As far as other scientific methods are concerned, the method of synthesis, the method of description, the method of deduction and induction, and the method of generalization and specialization were used. As the primary data source, domestic and foreign professional and scientific literature was studied, which is very scarce - only a few articles on the subject and relevant websites. Also, data from the State Bureau of Statistics and the Ministry of Finance of the Republic of Croatia were used to define macroeconomic projections of the economy of the Republic of Croatia.

The paper is divided into three interconnected parts. The first part describes the emergence of the coronavirus pandemic COVID-19, the second part analyses the economic measures to mitigate and eliminate the economic crisis in the Republic of Croatia caused by the pandemic, and the third part presents the results of the conducted research.

This paper's contribution is to analyze the operations of Croatian companies by sector to conclude what can be expected in the future in the event of a similar or larger pandemic.

2. THE EMERGENCE OF THE PANDEMIC COVID – 19

A new form of coronavirus (SARS-CoV-2) was discovered for the first time in December 2019 in the city of Wuhan in China and is the cause of the disease called COVID-19. This global pandemic is considered one of the most significant health and macroeconomic shocks in the history of humanity. The coronavirus spread quickly worldwide and became a major global health problem. The pandemic mentioned above is unique in its rapid and easy virus spread. As a result, more than 600 million people worldwide have been infected with the coronavirus. The highest number of deaths from the coronavirus in the world is recorded in the USA, followed by Russia, Brazil, and India, which recorded more than 1.8 million deaths. However, if we look at the number of deaths per capita, Russia and Peru have the highest number, while the USA is in 20th place (Croatian Institute of Public Health, 2020). Soon after, the coronavirus appeared in the Republic of Croatia. The first coronavirus case in Croatia was

diagnosed in February 2020 in Zagreb. The total number of people infected in Croatia since the pandemic's beginning is over one million, while the total number of deaths is about 16.5 thousand (HZJZ, 2022).

The spread of the coronavirus in the Republic of Croatia can be divided into five waves: (Ministry of the Interior of the Republic of Croatia, 2022).

1. Wave that lasted from March to June 2020,
2. Wave that lasted from August 2020 to February 2021,
3. Wave that lasted from March to June 2021,
4. Wave that lasted from August to December 2021 and
5. Wave that started in January 2022 and continues until today.

The COVID-19 pandemic has caused a global economic crisis that no one expected. According to calculations by the International Monetary Fund, the coronavirus pandemic produced the worst economic consequences since the Great Depression in 1929, with a significant drop in income per capita and an increase in unemployment in more than 170 countries. Compared to previous crises, the cause of this crisis is not in the financial and economic system, but the leading cause is the exogenous shock from the pandemic outbreak. Unlike previous crises, the crisis caused by the COVID-19 virus pandemic caused as many as four negative shocks (Čavrak, 2020):

1. Supply shock,
2. Demand shock,
3. Shock of negative expectations and uncertainty and
4. Potential shock of untimely and inadequate reactions of macroeconomic management.

The first shock is a supply shock that begins with a health shock because companies have suspended their activities because of the measures taken to protect against the coronavirus. The impact on foreign economies also causes supply shock. Also, the large number of deaths created a shock of negative expectations and uncertainty, which led to a decrease in consumption and disruption in investments. A decrease in demand leads to a decrease in the company's cash flow, which leads to the fear of bankruptcy. Companies first protect themselves from possible bankruptcy by laying off workers, which increases unemployment. This causes a decrease in the income of unemployed households and an increase in "bad credit" and loan defaults. The financial system was consequently compromised and exposed even to more significant risks that reduced people's

purchasing power, leading to a further reduction in demand. This increased uncertainty and fear, so a new, deeper negative cycle is entered: further reduction of consumption, reduction of production and employment, reduction of business and household income, and so on in a charmed circle (Čavrak, 2020).

Given the situation, many governments and countries around the world have imposed strict restrictions and measures such as isolation and social distancing, travel bans, movement restrictions, and the like during the pandemic, which has caused a sudden and unexpected decline in economic activity, including production, employment, and net export. Such a situation did not bypass the Republic of Croatia, which stood out during the pandemic for its highly restrictive measures but was also particularly economically affected. (Rogić Dumančić, Bogdan & Raguž Krištić, 2021).

The following table shows fundamental macroeconomic indicators for the Republic of Croatia in the pre-pandemic and pandemic years.

Table 1. Fundamental macroeconomic indicators in the Republic of Croatia from 2016-2022.

	2016	2017	2018	2019	2020	2021	2022
Number of inhabitants (in millions)	4,174	4,125	4,088	4.065	4,048	3,879	3,854
GDP (in millions of euro, current prices)	47.331	49.516	51.933	54.784	50.451	58.207	67.390
GDP per inhabitant (in euro)	11.339	12.005	12.704	13.476	12.464	15.006	17.486
GDP-real annual rate change (in %)	3,6	3,4	2,8	3,4	-8,6	13,1	6,3
Average annual inflation rate-consumer prices index (CPI)	-1,1	1,1	1,5	0,8	0,1	2,6	10,8
Current balance of payments (in millions of euro)	1.056	1.719	931	1.576	-268	1.022	
Import of goods and services (in % GDP)	47	49,7	50,2	51,5	41,5	50	
Export of goods and services (in % GDP)	45,8	49	51,1	51,8	48,6	52,7	
Foreign debt (in millions of euro, period end)	45.050	43.879	52.809	40.589	41.285	47.213	
Foreign debt (in % GDP)	95,2	88,6	82,4	74,1	81,8	81,1	
Gross international reserves (in millions of euro, period end)	13.514	15.706	17.438	18.560	18.943	25.022	27.877
General government debt (in % GDP)	79,7	76,5	73,2	71	87	78,4	
Long-term interest rates (in % annual level)	3,49	2,77	2,17	1,29	0,83	0,45	2,7
Unemployment rate (according to the ILO definition, population older than 15)	13,1	11,2	8,4	6,6	7,5	7,6	7,1

Source: https://www.hnb.hr/statistika/glavni-makroekonomski-indikatori (accessed 05/30/2023)

It is evident from the table that the number of inhabitants decreased the most during 2021. Still, it would be wrong to interpret that the pandemic caused this, but rather that the assumption is that this results from several macroeconomic factors in combination with the demographic problem of the Republic of Croatia. In the first year of the pandemic (2020), the GDP per capita fell by 8.6%, but in 2021 it rose by 13.1% and nominally exceeded the GDP from the pre-pandemic year 2019. During the pandemic, the average inflation rate was 0-3%, but in 2022 inflation was over 10%. Given the various economic restrictions in force in 2020, in the same year, the account of the current balance of payments was negative (-268 million EUR), exports of goods and services fell below 42% of GDP, and imports below 50%, while foreign debt increased to over 80% due to new indebtedness. Regardless of various subsidies to the economy by the Government of the Republic of Croatia, international reserves constantly increased even during the pandemic years, interest rates fell to lower levels than usual, and the unemployment rate remained constant due to various measures of subsidizing workers at employers who were prevented from the performance of work.

3. ECONOMIC MEASURES FOR MITIGATING AND ELIMINATING THE ECONOMIC CRISIS IN THE REPUBLIC OF CROATIA CAUSED BY THE PANDEMIC

The European Commission has ensured the supply of vaccines for EU citizens. It has conditionally approved six vaccines from December 2020 to BioNTech and Pfizer, Moderna, AstraZeneca, Johnson & Johnson, Novavax, and Valneva. Since then, there has been a continuous increase in the number of vaccine doses arriving in member states. As for the EU, by mid-2022, over 70% of the adult population has been fully vaccinated. As new variants appeared, the Commission initiated mobilizing funds for urgent research. The European Commission continued to enter into contracts for the vaccination of the new version of the virus and the purchase of the modified vaccine in advance (European Commission, 2021). The Commission initiated the procurement of medical equipment for vaccination purposes, and admiringly the European Health Crisis Preparedness and Response Authority (HERA) was launched to avoid or quickly respond to a health crisis.

Europe's recovery from the financial and social impact caused by the CO-VID-19 pandemic is crucial to realizing its economic interests. The European Recovery and Resilience Plan agreed upon by the European Commission, the European Parliament, and representatives of all member states will significantly help in this. A total of EUR 2.018 trillion has been allocated from the long-term EU budget and the NextgenerationEU instrument to help tackle the consequences of the COVID-19 pandemic. At the same time, the European Commission will be able to sustain a debt worth 800 billion euros. Within the European recovery plan, Croatia will receive EUR 5.5 billion in grants for re-covery and stabilization from the Corona crisis (European Commission, 2021).

Temporary aid from the European Commission to reduce the risk of un-employment in emergencies such as the COVID-19 pandemic is implemented through the SURE instrument. The SURE instrument aims to protect jobs in times of crisis when job cuts and reduced working hours occur. The support provided by this instrument is in the form of loans with a social impact so that every euro can be invested for the benefit of citizens. In the framework of this instrument, financial assistance with a total value of over 100 billion euros was distributed to the member states to cope with the increase in public expen-ditures to preserve jobs during the corona crisis. In 2020, around 31 million employees and 2.5 million companies received this support under the SURE instrument, which is more than a quarter of the total number of workers in the member states (European Commission, 2021).

3.1. Fiscal policy measures

As a result of the COVID-19 pandemic, a severe health and economic crisis appeared, and the goal of the fiscal policy was to prevent further spread and mitigate the consequences that occurred at the global and domestic levels. The Government of the Republic of Croatia tried to mitigate the negative conse-quences of COVID-19 with various fiscal measures and thus stimulate eco-nomic recovery. Fiscal policy measures were aimed at companies and residents.

The fiscal policy response to challenging situations is essential to public poli-cies. The significant measures from the fiscal policy measures refer to the formal and material nature. According to its segments, the tax procedure is adaptable to such situations and has become flexible. Concerning the legal nature, measures such as extended deadlines for submitting tax returns, postponement of tax pay-

ments, and shortening tax refund deadlines have been defined. As part of the material measures of the fiscal policy, there are extended tax exemptions and a reduction in the base of certain tax forms. The lockdown itself impacted the fiscal system and all related measures, so the crisis led to a decrease in fiscal revenues. However, it was challenging to preserve entrepreneurship in such conditions. Due to the pandemic, the Government of the Republic of Croatia initiated several measures to achieve economic goals related to preserving or preventing an impact on the economy's liquidity and entrepreneurs and households while preserving jobs. The Government's measures were related to reducing government revenues or the growth of expenditures, which led to additional borrowing. The fiscal policy response included fiscal expansion and an increased deficit, which contributed to the preservation of jobs and employment (Žunić Kovačević, 2021).

In order for the consequences of COVID-19 to lead to the most minor economic damage possible, measures were adopted in March 2020. The first measure was a three-month postponement of the payment of income tax and profit and salary tax, which can be extended for another three months, with subsequent repayment in installments over 24 months. A set of measures related to financial liquidity is also an instrument of a three-month moratorium on obligations to HBOR (Croatian Bank for Reconstruction and Development) and commercial banks, approval of liquidity loans for payment of salaries, and other obligations. The plan of measures contains interest-free loans from municipalities, cities, and counties, the Croatian Health Insurance Institute, and the Croatian Pension Insurance Institute up to the amount of income tax, surcharges, and contributions whose payment has been deferred and/or installment payments have been approved. The parafiscal system and the simplified procedure for collecting public benefits were also changed, with enhanced and simplified procedures for deferring the collection of public benefits. The consequences of the crisis of the fiscal system are manifested in changes at the institutional level, changes in the procedural bases of the provisions of the General Tax Code, and specific changes in some aspects of some tax forms. The changes concern the profit tax system, the income tax system, the value-added tax system, and changes in traffic and real estate taxation.

Measures related to the corporate tax system were also defined - lowering the corporate tax rate from 12% to 10% for small businesses with an annual income of up to one million euros, and the deadline for advance payments for entrepreneurs was extended. The income tax system envisaged a reduction in

tax rates with a change in tax brackets, namely the upper tax rate from 36% to 30% and the lower tax rate from 24% to 20%. Progressive taxation was retained in order to build a fair tax system. In the consumption taxation system, there is the smallest measure by which it can be concluded that the solutions will probably not be long-term even after the crisis.

According to crises, it can be seen that the approach to property and real estate taxation needs to be redefined. However, according to financial and legal theory, there is a rule that there is no increase in the tax burden in crisis situations. Due to the pandemic, income tax relief was needed, that is, a long-term sustainable solution in redistributing the current tax burden on property and real estate of taxpayers, which is an effective way to increase tax revenues. The differentiation of the tax burden according to the taxing power and the size of the income through income taxation has the benefit of reducing the unsociability of the value-added tax, so keeping the progression in that part of the tax system has long-term positive effects. Measures in the fiscal system related to various aid forms have a short-term negative effect on costs, i.e., an increase in government spending. For this reason, such measures are not sustainable in the long term (Žunić Kovačević, 2021).

Allocating tailored assistance to SMEs based on their needs presented significant administrative challenges for national tax authorities. Fiscal policy measures supported by monetary and financial policy aimed to maintain business cash flow. These measures included extending tax deadlines, delaying tax payments, speeding up tax refunds, more generous compensation for losses, and some tax exemptions, including taxes on social security contributions, payroll taxes, or property taxes. Most countries in the region have helped companies retain employees with short-term work programs or wage subsidies. Many countries provided household income support through targeted benefits rather than tax credits.

3.2. Monetary policy measures of the Croatian National Bank

Monetary policy is responsible for a stable financial system of a country that ensures a sufficient flow of funds for smooth payment operations, taking into account price stability, inflation, and balance in international payments. The Croatian National Bank (CNB) has the primary goal of maintaining price stability, but it also provides support for the general economic policy of the Euro-

pean Union. The goal is to achieve balanced and sustainable economic growth and a high level of employment. Below are some of the monetary policy measures by the CNB that help to eliminate the corona crisis. (Croatian National Bank, 2020).

a. Structural operations of the Croatian National Bank

The CNB is implementing structural operations to ensure long-term monetary liquidity where there is an opportunity for credit institutions that can meet the demand of all sectors for longer-term loans. In order to deal with the crisis more efficiently, the CNB announces the maintenance of a structural operation for five years, with an interest rate of 0.25%.

b. Purchase of securities of the Republic of Croatia by the CNB

In response to the COVID-19 crisis, the Croatian National Bank first purchased the Republic of Croatia securities worth over HRK 1.3 billion. Not long after, the Croatian National Bank again bought valuable Croatian securities worth over HRK 2.7 billion and HRK 9.5 billion.

c. Establishing a currency swap

The Croatian National Bank, in agreement with the European Central Bank (ECB), established lines for the currency exchange agreement, the so-called currency swap that was available in the event of the need to exchange Croatian kuna for euros until January 1, 2023, when Croatia also officially became a user of the euro.

d. Foreign exchange interventions

The consequences of the economic crisis are difficult to determine in detail, as well as the types and the very intensity of measures taken by the governments of the affected countries to combat and alleviate the crisis. Because of this uncertainty, the international financial markets were in great dilemmas, and Croatia, there was an increased demand for foreign exchange. Consequently, there was a depreciation of the EUR/HRK exchange rate. Considering this, the CNB even sold foreign currency three times to preserve the exchange rate's stability, which is a prerequisite for preserving price and financial stability. The total sale of foreign currency in the three interventions mentioned above amounted to EUR 1,214.35 million.

e. Reduction of the reserve requirement rate

The Croatian National Bank reduced the reserve requirement rate from 12% to 9%. The primary purpose of such reduction is to release additional liquidity that enables the banking system and the economy to overcome the crisis more quickly. The reduced reserve requirement rate aimed to reduce the total reserve requirement by over HRK 10 billion, and the CNB returned the allocated part of the HRK reserve requirement in the amount of over HRK 6 billion to the banks.

f. Purchase and sale of securities of the Republic of Croatia from other parties

The Croatian National Bank expanded the circle of those who can implement monetary policy. It enabled the purchase and sale of Croatian securities by pension and investment funds and insurance companies. They could participate in trading securities of the Republic of Croatia, if there is financial stability and the technical conditions are met. The main goal of such securities trading during the COVID-19 pandemic is to maintain the stability of the government securities market.

g. Auction of direct purchase of bonds of the Republic of Croatia in Kuna

As of March 18, 2020, the CNB is directly holding auctions to purchase Croatian securities in national kuna currency.

3.3. Measures of the Croatian Bank for Reconstruction and Development (HBOR) to help the economy

In order to reduce the negative impact of the COVID-19 pandemic, the Croatian Bank for Reconstruction and Development (HBOR) introduced new measures to maintain economic activity, liquidity of economic entities, and employment in the Republic of Croatia. The introduced moratorium measures enabled entrepreneurs to reschedule their loan obligations to HBOR and directly approve new favorable loans for liquidity.

The mentioned measures are related to the postponement or rescheduling of the payment of existing obligations, the existence of favorable new loans for liquidity, and the possibility of using insurance for the portfolio of liquidity loans granted to exporters. At the same time, HBOR assumes 50% of the risk when repaying the loan. Entrepreneurs still have other HBOR programs for

lending investments and working capital. Some of such HBOR measures are listed below. (HBOR, 2020).

a. Moratorium on existing obligations

In order to help the economy during the COVID-19 pandemic, HBOR enabled its users who have received a loan directly from HBOR to use a new or additional moratorium for a duration of 7 to 16 months, as follows: the moratorium was available to all HBOR users until seven months, i.e., until 30.9.2020. years; the moratorium was available to users with a positive COVID score according to the FINA methodology for up to 10 months, i.e., until 31.12.2020. years; the moratorium was available to users from tourism activities for up to 16 months, i.e., until 30.6.2021. years. As for users who were granted a loan through a commercial bank, they had to agree on their moratorium with the commercial bank that issued them the loan. The same applied to funds approved through leasing companies. During the moratorium period, the loan principal is not repaid, and interest and fees are not charged, which immensely helped users during the pandemic period.

b. Reprogramming of credit obligations

During the COVID-19 pandemic, entrepreneurs were allowed to reschedule existing credit obligations under HBOR. The reprogramming allowed for more extended use, waiting, and loan repayment. Such reprogramming of existing loans could be used by all HBOR loan borrowers who cannot perform planned activities due to the COVID-19 pandemic. As for reprogramming fees, entrepreneurs were exempted from regular fees for up to 6 months (as of June 30, 2020). Also, entrepreneurs from tourism activities were allowed to use the reprogram without paying fees for 16 months from March 1, 2020.

c. Working capital for the measure of Covid-19

Loan approval within this measure was done through commercial banks according to the risk-sharing model. In the first three years of loan repayment, the interest rate was 0% for HBOR's share in the loan (interest rates are subject to state aid regulations). The beneficiaries of such loans are private and public-sector business entities that were exceptionally negatively affected by the COVID-19 pandemic and the consequences it caused. For HBOR's share in

the loan, there was no application processing fee or funds reservation fee. The minimum loan amount was HRK 1 million, and the loan repayment term was up to 5 years, with a grace period of up to one year. Exceptionally, for loans for more than HRK 37 million, direct lending by HBOR was also available.

d. *New ways of securing loans and guarantees*

In cooperation with commercial banks, HBOR is introducing new ways of securing loans and guarantees to facilitate the approval of favorable loans for liquidity and the fastest possible recovery of entrepreneurs negatively affected by the COVID-19 pandemic. This includes securing a portfolio of loans for liquidity, subsidizing premium costs, and guarantees for entrepreneurs in the tourism and transport sectors. Loan portfolio insurance enables HBOR to cover up to 90% of the approved loan principal held by banks in their portfolio, which allows faster and easier approval of new funds to support exporters' liquidity. The premium cost subsidy measure could be used by exporters who did not reduce the number of employees by more than 20% or more than 50% and had no outstanding obligations to the state.

4. THE IMPACT OF THE COVID-19 PANDEMIC ON THE BUSINESS PERFORMANCE OF CROATIAN COMPANIES - RESEARCH RESULTS

In order to analyze the impact of the COVID-19 pandemic on the operations of Croatian companies, the authors conducted research in such a way that they analyzed the ten largest companies from the five most dominant sectors of the Croatian economy (agriculture, forestry, and fishing; manufacturing; construction industry; wholesale and retail trade and the activities of providing accommodation and preparing and serving food) and compared the trend of income and profit in these sectors in the pre-pandemic period (2017-2019) with the most intense pandemic period (2020-2021), as the years in which the pandemic had the most significant economic consequences on society and the economy in general. The collected data was obtained through the portal www.fininfo.hr. The main criterion for the company's size was the revenue achieved in 2021 and companies that have not operated since 2017 but were founded later due to the impossibility of monitoring the trend of revenue and profit in the pre-pandemic and post-pandemic periods.

The following charts show the trend in the cumulative revenue and profit of the ten most prominent companies in the period 2017-2021 in five selected sectors in the Republic of Croatia.
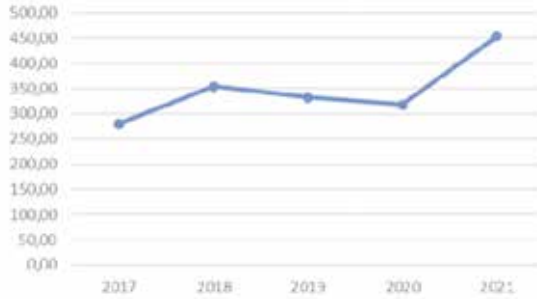
Chart 1. Revenues of the largest companies in the Republic of Croatia from the agriculture, forestry, and fishing sectors from 2017-2021. (in millions)
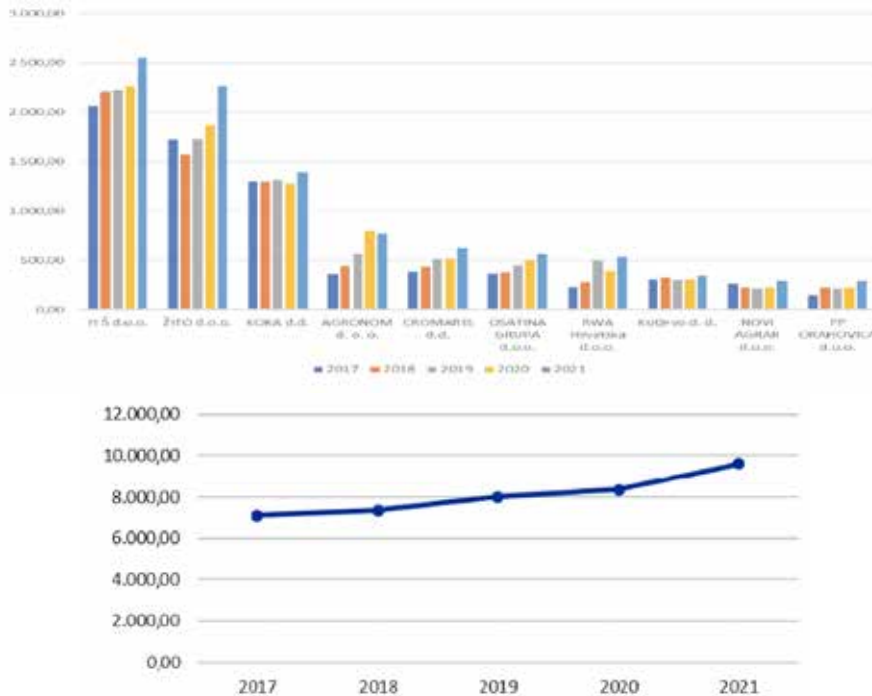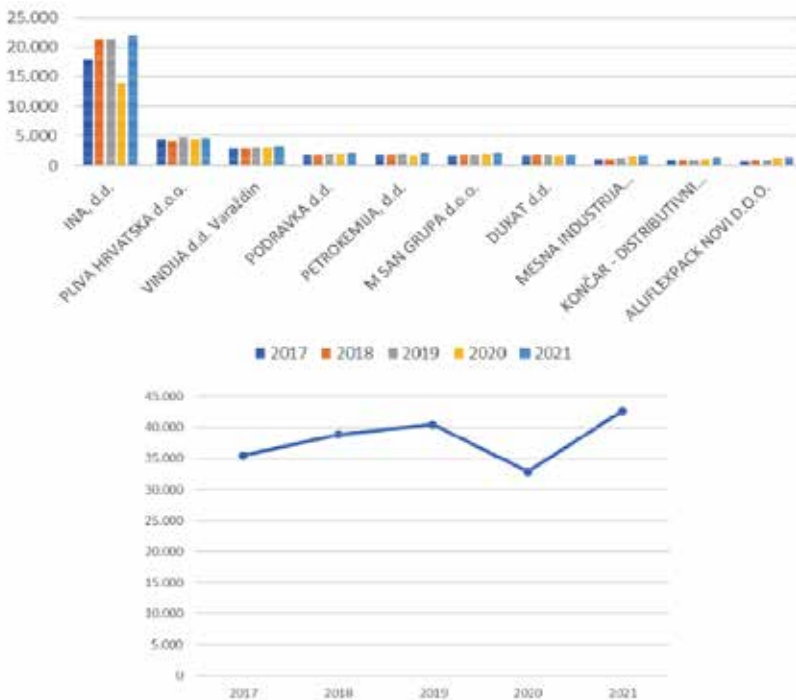

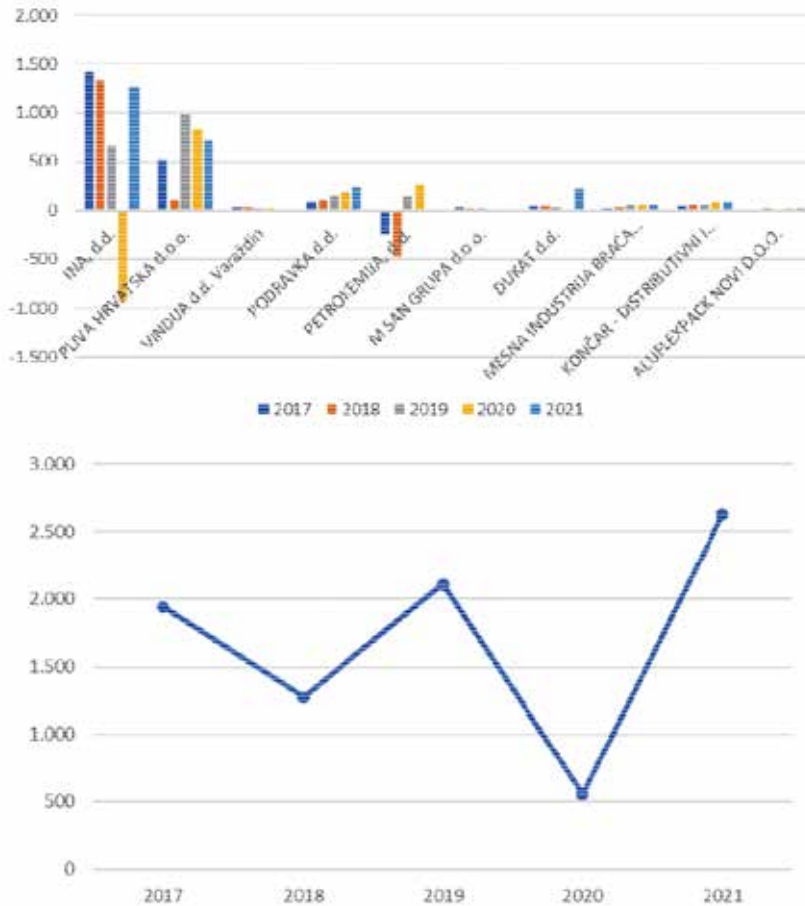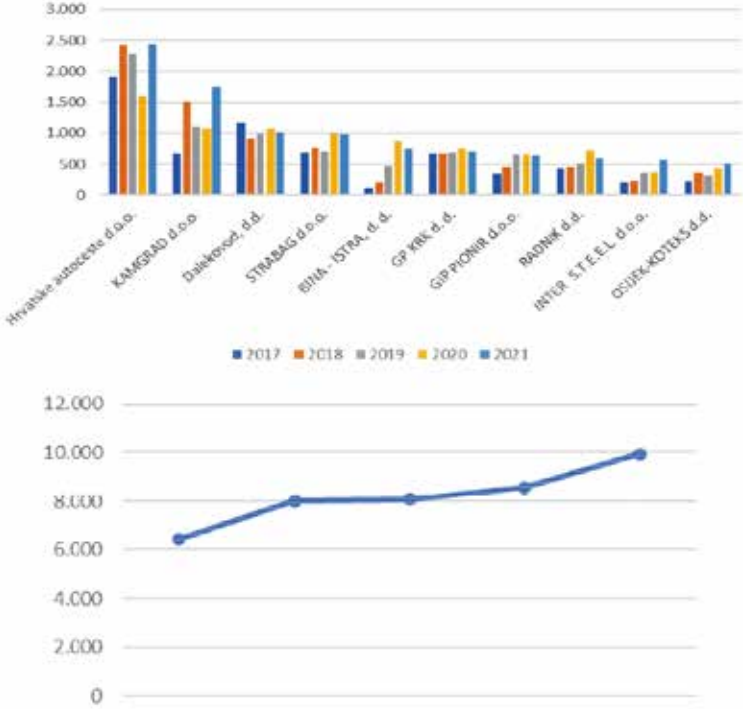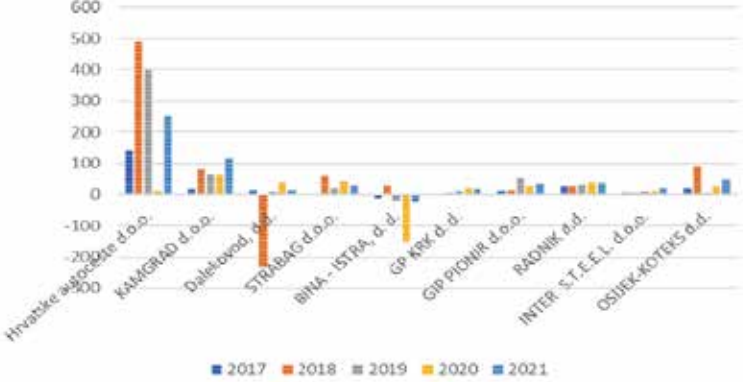**Source:** Created by the authors based on data at www.fininfo.hr (accessed May 20-25, 2023)

Chart 2. Profit of the largest companies in the Republic of Croatia from the agriculture, forestry, and fishing sector from 2017-2021. (in millions)

The chart shows that the ten most prominent companies in the Republic of Croatia from the agriculture, forestry, and fishing sectors did not experience a drop in income in the 2020-2021 pandemic period, while the company's profit in 2020 decreased by approximately 4% percent compared to the previous year. However, in 2021 it increased by as much as 43% compared to 2020.

Chart 3. Revenues of the largest companies in the Republic of Croatia from the manufacturing industry sector from 2017-2021. (in million)

Chart 4. Profit of the largest companies in the Republic of Croatia from the manufacturing industry sector from 2017-2021. (in million)

Analyzing the revenues and profits of the largest companies in the Republic of Croatia in the manufacturing industry sector, it can be concluded that a significant drop in revenues occurred in the first pandemic year (2020), with a drop in total revenues of 19%. However, the same revenues already in the next pandemic year (2020) returned to the level of 2019 with a constant growth tendency. The drastic drop in profit in 2020 amounted to 74%, but in 2021, profit exceeded the amounts from the pre-pandemic year 2019.

Chart 5. Revenues of the largest companies in the Republic of Croatia from the construction sector from 2017-2021. (in million)

Chart 6. Profit of the largest companies in Croatia from the construction sector from 2017-2021. (in million)
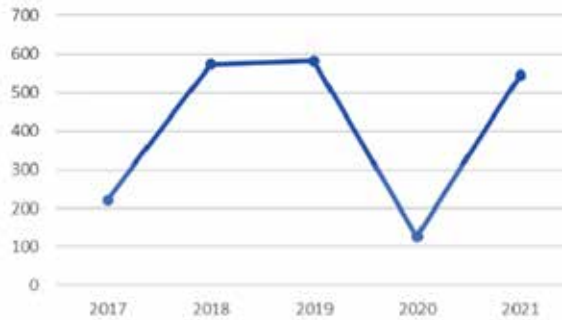
There was no decrease in income in the construction sector of the largest companies - thanks to large capital projects that continued to be implemented even during the pandemic. However, in 2020, income increased by 6% compared to the previous year, and in 2021 by 16 % compared to 2020. On the other hand, the profit of the largest companies in the construction sector fell by as much as 78% in the first year of the pandemic, but in the next year (2021), it almost returned to the level of 2019.

Chart 7. Revenues of the largest companies in the Republic of Croatia from the trade sector from 2017-2021. (in million)
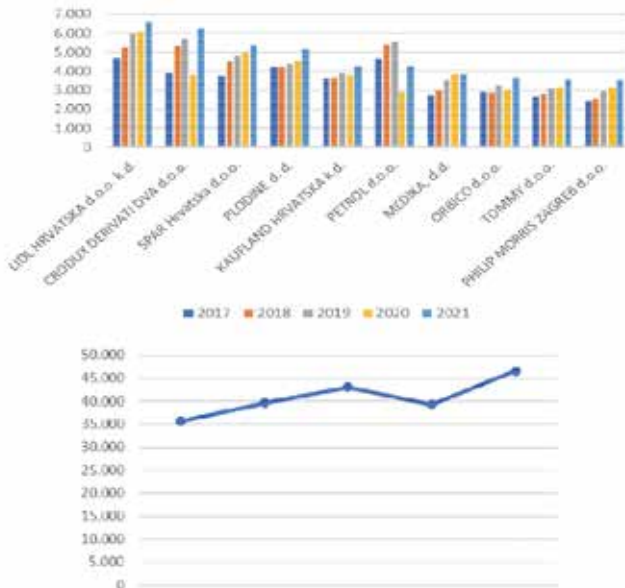
Chart 8. Profit of the largest companies in Croatia from the trade sector from 2017-2021. (in million)
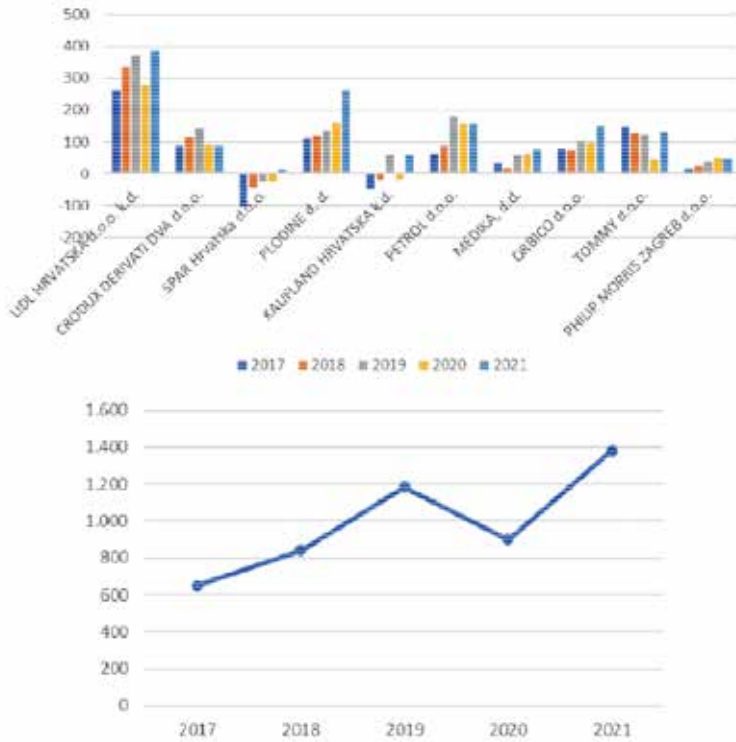
In the trade sector, the largest companies in the Republic of Croatia experienced a slight drop in turnover of 8% in the first year of the pandemic. However, in the second year of the pandemic, revenue increased by 19% compared to the previous year. In the first year of the pandemic, profit decreased by 24%, but the following year it increased by 51% and was 17% higher than the pre-pandemic year (2019).

Chart 9. Revenues of the largest companies in the Republic of Croatia from the tourism sector (providing accommodation services and food preparation and serving) from 2017-2021. (in million)

Source: Created by the authors based on data at www.fininfo.hr (accessed May 20-25, 2023).

Chart 10. Profit of the largest companies in the Republic of Croatia from the tourism sector (providing accommodation services and food preparation and serving) from 2017-2021. (in million)
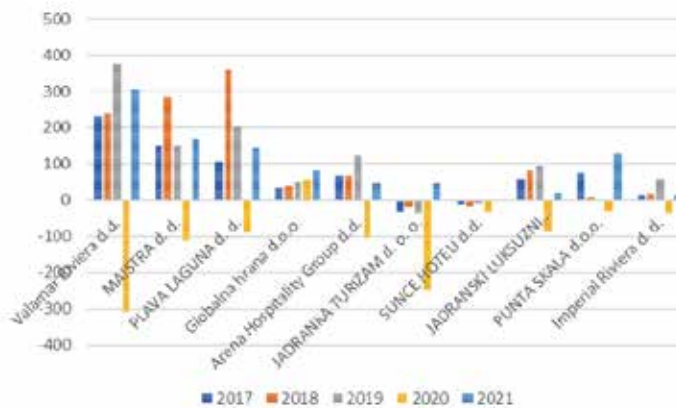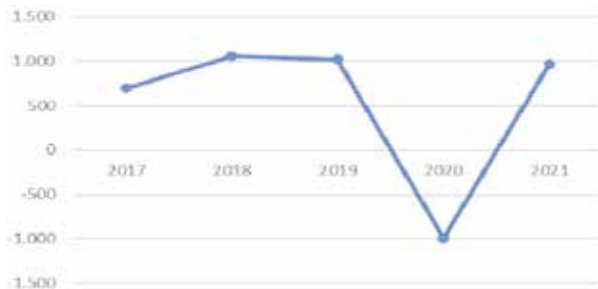
Taking into account the indicators from all sectors, it can be concluded that the pandemic crisis caused by COVID-19 hit the tourism sector the most in the first year, when very rigorous epidemiological measures were in force, so in 2020, a drop in revenue was recorded for the most prominent companies of 54 %. The pre-pandemic profit of over one billion euros was turned into a loss of almost one billion euros in the first year of the pandemic. In the following year, 2021, both revenue and profit returned to the level of 2019.

5. CONCLUSION

The global COVID-19 virus pandemic undoubtedly left a profound negative impact on the entire economy of the Republic of Croatia. The economic crisis that came together with the pandemic is most visible in the negative movement of the main macroeconomic variables of the Republic of Croatia after March 2020. As one of the best indicators of the economy, the GDP decreased significantly in that period, and there was also a disruption in the labor market in terms of a decrease in employment and an increase in unemployment. Due to the closure of borders and the impossibility of circulation of goods and services between Croatia and the rest of the world, there was also a drop in foreign trade exchange with other countries. Due to the sharp drop in economic activity caused by the pandemic crisis, a drop in consumer prices also occurred. The economic crisis also led to a negative effect on certain economic branches of the Republic of Croatia. Thus, industrial production decreased due to the closing of factories, while tourism experienced the biggest shock.

In order to alleviate the crisis and ensure assistance to the economy, the Government of the Republic of Croatia adopted a series of measures that were

continuously adapted to the epidemiological and economic situation. The most important measures are to delay public payments, preserve jobs, and secure loans for liquidity. Ultimately, it is possible to conclude that the impact of the pandemic on economic trends and indicators would be much more substantial in a negative sense without an appropriate supporting framework and measures that targeted economic flows.

Analyzing the available data on the revenues and profits of the largest companies in the Republic of Croatia by various sectors, it can be concluded that revenues in the first pandemic year (2019) decreased in the manufacturing industry, trade, and tourism sectors, while they increased in the agricultural production and construction sectors. In the second pandemic year (2021), revenues in all sectors increased and almost returned to the level of 2019. Concerning income, a drastic drop in profits was recorded in all sectors in the first year of the pandemic (2020), especially in the tourism sector, where most companies made significant losses. However, in 2021, the profit level returned to the pre-pandemic level.

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PREPARATION OF COMPANIES FOR THE INTRODUCTION OF CSRD REGULATION - CHALLENGES AND IMPLICATIONS

Dina BIČVIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: dina.bicvic@efos.hr

Dražen NOVAKOVIĆ, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: drazen.novakovic@efos.hr

Sofija TURJAK, Ph.D.
Josip Juraj Strossmayer University of Osijek,
Faculty of Economics and Business in Osijek

E-mail: sofija.turjak@efos.hr

Abstract

Nonfinancial reporting, as a form of reporting on corporate sustainability and socially responsible behavior, is receiving more specific frameworks over time. Thus, the European Union has evolved the relatively flexible NFRD regulation into a much more organized CSRD regulation that will gradually cover all listed companies and their supply chain partners. Therefore, timely preparation of the staff in the accounting and finance departments of the companies is essential for successfully applying the CSRD regulation. By conducting the Wilcoxon signed-rank test and the McNemar test on the sample of companies with headquarters in eastern Croatia, the results of the research conducted as part of this paper clearly show that the awareness of upcoming regulatory changes is not satisfactory but that educational efforts in this area are instrumental and

lead to statistically significant results. Therefore, the main implication of this paper is that it is necessary to inform companies about the upcoming regulatory changes and to provide educational activities in collaboration with all the stakeholders involved in this process. It is strongly recommended to extend the focus of the research to the entire Republic of Croatia and the European Union to be able to analyze the situation comparatively, thus eliminating the main limitation of this paper in the form of a small sample of companies and individuals interested in this topic. Moreover, it would be desirable to repeat the same study with a time delay on the same respondents to determine the potential change in the degree of preparation of companies for the change in regulation.

__Keywords:__ Corporate Sustainability Reporting Directive (CSRD), nonfinancial reporting, sustainability reporting, legal framework, sustainable finance

__JEL Classification:__ G38, M14, M48, Q56

1. INTRODUCTION

In the Republic of Croatia, the obligation of nonfinancial reporting for large companies (Accounting Act, n.d.), which are also public interest entities, started on January 1, 2017. According to the sustainability reporting standards of the European Commission, all large and listed small and medium-sized companies will be gradually obliged to nonfinancial reporting in the period from 2024 to 2026. Given the current situation, awareness of the upcoming regulatory and business model change is deficient.

Regardless of short-term existence, corporate nonfinancial reporting is increasingly moving from voluntary to mandatory, and sustainability is becoming imperative in all business sectors and industries. This will require companies to address nonfinancial reporting alongside financial reporting, with a particular emphasis on sustainable ones. However, any change in the law brings with it numerous unanswered questions, uncertainties, and challenges in terms of high-quality and correct implementation and application, and it requires a high level of understanding and familiarity with the provisions, for which equally high-quality, precise, and adequate preparation is required in the first place.

Based on the above, the main goal of this paper is primarily to point out the importance of adequate preparation for the introduction of the new regulation, as it is still based solely on theoretical grounds, and it is impossible to draw con-

clusions and find examples of good practice in other countries. The importance of adequate preparation is highlighted by conducting research and analyzing companies' readiness in Eastern Croatia to introduce the new ESG regulation. The term "adequate preparation" refers primarily to conducting or participating in training on the topic mentioned and providing general information on the topic to stakeholders for whom the observed topic is a focus and part of their daily work.

The remainder of this paper is organized as follows. Section 2 presents the theoretical framework of corporate sustainability reporting practices and gives a research background. The methodology used, and the results of the survey conducted are presented in Section 3. Section 4 discusses the research findings and their implications and provides recommendations and directions for future research, followed by a conclusion.

2. THEORETICAL FRAMEWORK & RESEARCH BACKGROUND

Corporate social responsibility (acting socially responsible) is a business concept that has developed and changed over time under the influence of various factors, and significant progress has been made in applying this strategic concept. Thus, over time, the concept of ESG (environmental, social, and governance) factors emerged, which includes the environmental aspect, which refers to the reduction of greenhouse gas emissions and the protection of the natural environment; the social aspect, which means improving the working environment and promoting diversity, and the management aspect that refers to the practice of fair and transparent management (IDOP, 2021). The ESG concept stands for methods and processes to achieve global goals and includes the consideration of environmental, social, management, and financial factors in business decisions. Thus, in today's world, critical business decisions cannot be based only on financial factors but also environmental and social factors, affecting the company's financial results.

To better communicate with the interested public about the socially responsible activities carried out by companies, nonfinancial reporting has been developed, which includes activities and information that are not included in financial reports and involves the analysis, evaluation and impact of socially responsible corporate activities (IDOP, 2021). Thus, according to the European

Union's NFRD (Nonfinancial Reporting Directive) regulation, companies must include in their management report a nonfinancial report that contains the information necessary for understanding the company's performance, results, and position, as well as the impact of its activities, which, at a minimum, relate to environmental, social, and human resources issues, respect for human rights, anti-corruption, and issues related to bribery (European Union, 2014). However, the lack of a precise measurement system in all previous models, including the NFRD regulation, encourages key external stakeholders to look for other sources to decide whether the company works in their interest (IDOP, 2021). Because of these shortcomings, the European Union has adopted a new CSRD regulation as part of a broader strategic framework.

The Corporate Sustainability Reporting Directive (CSRD) sets standards for the disclosure of ESG information. It imposes the obligation to disclose ESG-related information on all large companies (listed and unlisted) and listed small and medium-sized public interest entities, expanding the current scope of obligations under the NFRD regulation (Hanfa, 2023). The European Union's strategic framework on sustainability includes several elements that attempt to cover all the essential factors that influence a company's decision to become sustainable, i.e., primarily answers to the questions of what it wants to achieve, how it will be measured and regulated, and, perhaps most importantly, how it will be financed. For example, the Action Plan on Financing Sustainable Growth outlines a strategy for redirecting capital flows toward sustainable investments that support the European Green Plan, which aims to make the European Union the first carbon-neutral continent by 2050 and reduce greenhouse gas emissions by at least 55% from 1990 levels by 2030. The regulatory element supporting these two plans comprises three legal acts (Hanfa, 2023). Taxonomy Regulation establishes a single classification system at the European Union level for determining whether an economic activity is environmentally sustainable. The Sustainable Finance Disclosure Regulation (SFDR) ensures the disclosure of information on the sustainability of financial products. The CSRD regulation requires companies to publish standardized and audited sustainability reports. The meaning of such a comprehensive approach lies in the fact that in order to promote sustainable business practices, it is necessary to animate all stakeholders in the process - from the nonfinancial sector, whose sustainability is the primary goal, to the financial sector, i.e., investors, who need to financially support this transition to sustainability, to the general public, who should recognize and select sustainable businesses in their daily micro- and macroeconomic decisions.

It is interesting to note that the European Union has imposed a reporting obligation not only on companies but also on their financiers, who are required by the Sustainable Finance Disclosure Regulation (SFDR) to harmonize their past business activities (Hanfa, n.d.), as the sustainability of the projects and companies they finance is now in focus. Indeed, the SFDR regulation establishes harmonized rules for the transparency of financial market participants and financial advisors regarding the inclusion of sustainability risks, the consideration of negative impacts on sustainability in their processes, and the provision of information on sustainability about financial products (European Union, 2019). It is important to note that the European Union is a leader in adopting ESG regulations and in the practical application and support of the transition to sustainability. In 2022, assets in European ESG investment funds totaled $2,078 billion, while the rest of the developed world accumulated only $419 billion in ESG funds (Hanfa, 2023).

The complete application of the Taxonomy Regulation entered into force on January 1, 2023, as did the SFDR regulation, while the CSRD regulation will be applied gradually from January 1, 2024. In fact, according to the CSRD regulation, the application starts only for existing nonfinancial reporting entities under the NFRD regulation (reporting in 2025 on 2024 data), and all large companies will submit the report in 2026 on 2025 data. In addition, the application for listed small and medium-sized companies will come into effect with the reporting of 2026 data in 2027, while companies from third countries with significant turnover in the European Union market will also have to report 2028 data in 2029 (Hanfa, 2023). The CSRD regulation will ensure reporting on all sustainability topics. Considered according to the ESG model of sustainability, it will include E - environmental factors (climate change mitigation, climate change adaptation, water and ocean, circular economy, pollution prevention, and healthy ecosystem), S - social factors (equal opportunities for all, working conditions, and human rights), and G - management factors (role and composition of board and management, ethical and corporate culture including anti-corruption rules, political engagement, business relations, and risk management) (Hanfa, 2023).

The Corporate Sustainability Reporting Directive (CSRD) clearly emphasizes the need for reporting according to the principle of dual materiality. The principle of dual materiality means that companies include in their sustainability report information on social and environmental impacts that are important

to all stakeholders, and not only information on the impact of ESG issues on the value of the company, which is mainly relevant only to investors (IDOP, n.d.). To increase the quality level of (nonfinancial) sustainability reports, these reports are audited by accredited auditors according to the CSRD regulation (Lider media, 2023), which was not the case with the NFRD regulation.

In order to achieve standardization in the preparation of the report, the European Union has also mandated the European Sustainability Reporting Standards (ESRS), which include two cross-sector standards (general principles and disclosure requirements), five environmental standards (climate change, pollution, water and marine resources, biodiversity and ecosystems, and circular economy), four social standards (own workforce, value chain workforce, affected communities, consumers, and end users), and one management standard - business conduct (Hanfa, 2023). In adopting the ESRS standards, the European Union took its cue from the existing Global Reporting Initiative (GRI) standards, and the ESRS standards were designed to be very similar to the GRI standards (Global Reporting Initiative, 2022).

The current obligors of nonfinancial reporting under the NFRD regulation are sizeable public interest entities - issuers whose shares are listed on the stock exchange, credit institutions, insurance and reinsurance companies, investment fund management companies, and other entities designated by the state as public interest entities (Hanfa, 2023). It is important to note that those required to report non-financially under the EU Taxonomy Regulation will publish data on three key indicators in 2023 - the share of sales, the share of capital expenditures, and the share of operating costs generated by products/services related to environmentally sustainable economic activities under the EU Taxonomy Regulation.

According to the Croatian Accounting Act (Article 21. a), large companies that are public interest entities and exceed the criterion of an average number of employees of 500 during the previous fiscal year on the balance sheet date are currently required to publish nonfinancial statements. However, the application of the CSRD regulation will extend the scope of nonfinancial reporting obligations to all companies whose securities are listed on the regulated market of the European Union, including small and medium-sized companies, then credit institutions and insurance companies, regardless of their size, as well as companies from third countries with significant operations on the territory of

the European Union. This increases the number of obligors in the European Union from about 11,700 under the NFRD regulation to an estimated 50,000 under the CSRD regulation (Hanfa, 2023).

In Croatia, the number of obligors under the NFRD regulation increased from 67 obligors in 2017 to 76 obligors in 2020, and the number of obligors under the CSRD regulation is also expected to increase several times. When it comes to the preparation of Croatian companies for the new CSRD regulation and the readiness to turn to sustainable management, it is significant that of the listed companies that are not NFRD obligated, only five of them published a nonfinancial report for 2021. However, they were not obligated to do so (Hanfa, 2023). Even more telling is that of the listed companies that follow NFRD regulation, as many as five out of 42 have not published a nonfinancial report, even though they were required to do so.

Regarding the start of the application of the CSRD regulation in 2025 (data reporting for 2024), there are still no empirical and practical studies on the experience of its application. Therefore, a study of particular interest for the context of this paper comes from Primec and Belak (2022), who combined questions about the CSRD with the study of the current legislation (NFRD) to find out what changes it will bring and what opinions exist on whether companies will have better sustainability management after the CSRD comes into force.

The above questions were addressed in the research of authors Primec and Belak (2022), who, in the empirical part of their paper, analyzed the application of NFRD in the practice of selected Slovenian companies listed on the Slovenian Stock Exchange. The authors compare NFRDs and diversity policy reports and, based on the results, evaluate the practice of NFRD reporting in Slovenia and identify its strengths and weaknesses using a comparative methodology. Regarding the CSRD, the authors examined the challenges the new CSRD will bring, particularly the role of management and supervisory bodies in sustainability issues. Primec and Belak (2022:16) examine whether nonfinancial reporting is consistent with the requirements of the NFRD and whether nonfinancial reports are quantitatively and qualitatively adequate, and whether the conceptual changes included in the CSRD are necessary and justified to complement the requirements of the NFRD, and finally, whether the legislature's efforts are going in the right direction. In the research findings (Primec & Belak, 2022: 2-3; 16-17), the authors conclude that the state of the

companies studied in terms of nonfinancial reporting is generally good, but the shortcomings identified (inconsistent application of nonfinancial reporting following NFRD requirements and insufficient inclusion of corporate social responsibility) need to be improved in order to achieve higher levels of corporate social responsibility, transparency and integrity.

In addition, the qualitative part of nonfinancial reporting is the weakest (the quality and usefulness are lower, as substantive reports are not available, as expected); the surveyed companies still do not approach nonfinancial reporting qualitatively but tend to "tick-the-box" and ad hoc reporting; the existing NFRD reporting requirements are not fully met and understood. As a severe weakness of the NFRD, the authors cite an insufficiently standardized and precise data set that is uniform, binding and in digital form and would ensure the mutual comparability of data and, thus, the competitiveness of companies. The authors, therefore, conclude that the development of new regulations and the establishment of new reporting requirements under the CSRD with prescribed standards for nonfinancial information, as well as verifiability and auditing by a professional auditor, is justified, necessary for the quality of corporate nonfinancial reporting and the contribution to more sustainability-oriented corporate governance.

To the best of the authors' knowledge, the only paper dealing with the analysis of the preparation of companies in the European Union for introducing CSRD regulation is written by Győri & Szigeti (2023). Since companies preparing for CSRD reporting often use already prepared NFRD reports, the authors identify and analyze which international reporting guidelines are most frequently followed and which are the most common topics in NFRD reports. Thus, they conclude that the GRI standards are the most used international reporting framework for Hungarian companies subject to the NFRD regulation. Moreover, the NFRD annual reports of Hungarian companies mainly address environmental and social/employment issues, while anti-corruption and human rights are rarely mentioned.

3. METHODOLOGY & RESULTS

The authors conducted a course with participants from companies' finance departments in eastern Croatia. The course aimed to help financial professionals increase their knowledge about upcoming changes in ESG reporting.

Sixteen individuals attended the course, and they were given five questions to answer before the course as well as after the course. Descriptive statistics of the answers are shown in Table 1. The table presents the number of individuals who answered the question and the percentage of their answers in total. Missing values were excluded from this analysis.

Table 1. Descriptive statistics of given answers before and after the course

|	**BEFORE**		**AFTER**	
Q.1 Rate your knowledge of the ESG concept on a scale from 1 to 5. (1 = I don't know, 5 = I know very well)	1 = I do not know	12 (80%)	1 = I do not know	2 (13.3%)
			Two = I know a little	1 (6.7%)
	3 = I know something	3 (20%)	3 = I know something	7 (46.7%)
			4 = I know more than something	4 (26.7%)
			5 = I know very well	1 (6.7%)
Q.2 From 2024, nonfinancial reporting is an obligation for small and medium-sized financial institutions and companies.	Yes	12 (75%)	Yes	12 (75%)
	No	4 (25%)	No	4 (25%)
Q.3 Which of the following is the latest concept?	CSRD	4 (26.7%)	CSRD	11 (73.3%)
	ESG	11 (73.3%)	ESG	4 (26.7%)
Q.5 The EU taxonomy is a classification of companies according to the amount of salary in 8 classes.	Yes	2 (15.4%)	Yes	2 (15.4%)
	No	11 (84.6%)	No	13 (86.7%)

Source: authors' calculation

Based on the answers, there were no differences between the answers to Question 2, regarding nonfinancial reporting becoming an obligation for small and medium-sized financial institutions and companies from 2024. The exact number of respondents who gave the correct answer before and after the course. Interesting differences can be seen between the answers to Question 3, where most respondents thought ESG is the latest concept, while the correct answer is CSRD. Most of the respondents gave the correct answer after the course had finished.

Figure 1 shows the distribution of answers before and after the course to Question 4 (Choose the stakeholders of the ESG concept). Based on the answers presented in Figure 1, there is a difference in the given answers before and

after the class. All answers are correct; only one respondent answered correctly before the course. After the course, four respondents gave the correct answer. Based on the descriptive statistics, the authors suggest that the course is needed to educate financial professionals about upcoming changes in ESG reporting.

Figure 1. Descriptive statistics of given answers to the 4th question before and after the course
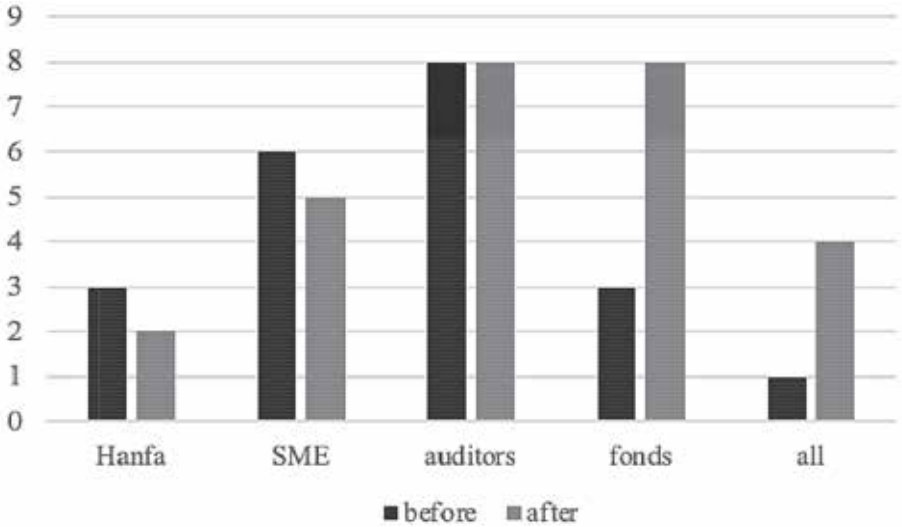
Since the sample is small, the authors conducted the Wilcoxon signed-rank and McNemar tests. A nonparametric test procedure, known as the Wilcoxon signed-rank test, is used to analyze matched-pair data or to solve the one-sample problem. The assumption that the probability distribution of the first sample is identical to the probability distribution of the second sample is tested in the matched-pair context. Statistics based on intrapair differences can be used to evaluate this idea (Woolson, 2008). For evaluating a hypothesis using paired dichotomous data, the authors used the McNemar test. Only the off-diagonal components are tested, and a chi-square test with one degree of freedom is the outcome. Because the sample size estimate depends only on the discordant, it must make assumptions about the fraction of discordant observations. Under the premise that the means are equal, it can be demonstrated that this test is comparable to a paired t-test (Lachenbruch, 2014). The authors used IBM SPSS 25 Statistical software to conduct the analysis.

According to the McNemar test results presented in Table 2, there is a statistically significant difference (p < 0.05) between the answers to the third question. The difference is recognized since most respondents changed their ESG to CSRD answers. The statistically significant difference supports the authors' opinion and suggestion that education about upcoming changes in ESG reporting is essential for financial professionals. There is no statistically significant difference between the answers to the two other questions.

Table 2. The differences between answers to 2nd, 3rd and 5th question

QUESTIONS					McNemar test results
Q.2 From 2024, nonfinancial reporting is an obligation for small and medium-sized and all financial institutions and companies.	**Before**		**After**		N = 16
			Yes	No	
		Yes	10	2	p = 1
		No	2	2	
Q.3 Which of the following is the latest concept?	**Before**		**After**		N = 16
			CSRD	ESG	
		CSRD	4	0	p = 0.016
		ESG	7	4	
Q.5 The EU taxonomy is a classification of companies according to the amount of salary in 8 classes.	**Before**		**After**		N = 16
			Yes	No	
		Yes	1	1	p = 1
		No	0	11	

Source: authors' calculation

The authors used the Wilcoxon signed-rank test to test the differences between the respondents' knowledge of ESG before and after the course. The results of the test are presented in Table 3.

Table 3. The differences between answers to the 1st question

		N	Mean Rank	Sum of Ranks	Wilcoxon signed-rank test results
Q.1 Rate your knowledge of the ESG concept on a scale from 1 to 5. (1 = I don't know, 5 = I know very well)	Negative Ranks	0	0	0	Z = -3.246
	Positive Ranks	13	7	91	
	Ties	2			p = 0.001
	Total	15			

Source: authors' calculation

According to the Wilcoxon signed-rank test result presented in Table 3, there is a statistically significant difference (Z = - 3.246, p < 0.05) between the

answers to the first question. The difference is recognized since most respondents improved their knowledge of the ESG concept after the course. Before the course, the respondents did not know about the ESG concept (mean = 1,40), while they answered that they knew something after the course (mean = 3,07). The statistically significant difference supports the authors' opinion and suggestion that education about upcoming changes in ESG reporting is essential and needed for financial professionals.

4. DISCUSSION AND CONCLUSION

Nonfinancial reporting, as a form of reporting on corporate sustainability and socially responsible behavior, is receiving more specific frameworks over time. For example, the European Union has evolved the relatively flexible NFRD regulation into a much more organized CSRD regulation that prescribes measurable standards strongly aligned with the widely accepted and highly developed Global Reporting Initiative standards. Applying this new regulation will gradually cover all listed companies and their supply chain partners. Indeed, the obligated party of the CSRD regulations will not be able to provide a high-quality nonfinancial report unless it cooperates with companies that also adhere to the CSRD concept in business, even if they are not obligated to do so themselves. Therefore, timely preparation of the staff in the accounting and finance departments of the companies is essential for successfully applying the CSRD regulation in all companies, regardless of whether they are liable parties or only part of the supply chain of one of the liable parties.

The research conducted as part of this paper clearly shows that the awareness of upcoming regulatory changes and expansions is unsatisfactory. However, educational efforts in this area are instrumental and yield statistically significant results. Therefore, the main implication of this paper is that it is necessary to inform companies about the upcoming regulatory changes and to provide educational activities in collaboration with the academic, governmental, corporate, and non-profit sectors, i.e., with all the stakeholders involved in this process. Sustainable business is a topic of interest and importance to society, so the stakeholders are all parts of society. In this regard, it is strongly recommended to extend the focus of the research to the entire Republic of Croatia and the European Union to be able to analyze the situation comparatively, thus eliminating the main limitation of this paper in the form of a small sample of companies

and individuals interested in this topic, before it becomes mandatory material. Moreover, it would be desirable to repeat the same study with a time delay on the same respondents to determine the potential change in the degree of preparation of companies for the change in regulations since it is a process that is just beginning and will have a substantial impact on all companies, regardless of their size and economic activity.

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