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REAL EFFECTIVE EXCHANGE RATE AND UNEMPLOYMENT ACROSS POST-TRANSITION EUROPE: EVIDENCE FROM WAVELET COHERENCE ANALYSIS

Abstract

Purpose: The aim of this paper is to examine the co-movement between the real effective exchange rate and unemployment across post-transition Europe.

Methodology: The research data sample in this paper consists of monthly data from 2000M1 to 2019M6 for ten European post-transition countries. After standard correlation analysis, the research followed a wavelet coherence approach, provided time-series analysis in the time-frequency domain and illustrated evolution of the co-movements in the observed period.

Results: Conventional approach research results suggest no significant correlation between variables under consideration in cases of Poland and Lithuania. In cases of Latvia and Slovenia, standard correlation coefficients were positive and not in line with the theory. Correlation coefficients supported the theoretical assumption in six other countries included in the study. Wavelet coherence analysis results provided deeper insights into the relationship over time and the frequency domain. Empirical results gained in this research revealed a decline in the unemployment rate accompanied by depreciation of the real effective exchange rate as a prominent pattern at the beginning of the observation period suggesting pro-cyclical monetary policy.

Conclusion: During the crisis of 2008 no link between variables under consideration was confirmed, while after the crisis empirical results were in line with the theoretical assumption, suggesting that depreciation of the real effective exchange rate might be used as an instrument to boost employment.

Keywords: Correlation, wavelet coherence, unemployment, real effective exchange rate

1. Introduction

European post-transition countries experienced a large increase in unemployment during a recession following the 2008 financial crisis. Campolmi and Faia (2015) emphasize that currency fluctuations represent a prominent determinant of labor market dynamics. The countries of interest in this research are different in terms of exchange rate regimes. Bulgaria established the currency board, Estonia, Latvia, Lithuania, Slovakia, and Slovenia are members of the Euro Area, while Croatia, Czechia, Poland and Romania follow a flexible exchange rate regime, at least de jure (Slavov, 2017). Czechia and Poland implemented inflation targeting and Junicke (2017)

found them likely to target Producer Price Index (PPI) inflation rather than Consumer Price Index (CPI) inflation. Furthermore, flexibility of the nominal exchange rate is often considered crucial for the adjustment of the real exchange rate to purchasing power parity (Huang & Yang, 2015). As already stated, some of the sample countries are members of the European Monetary Union (EMU). To establish an equilibrium real exchange rate in the EMU countries, the asymmetric measures are required (Jiang et al., 2016). Therefore, this paper observes ten European post-transition countries and examines the interrelationship between the real effective exchange rate and unemployment. As further elaborated in the literature review section, the nature of a relationship might be ambiguous and cannot be assumed prior to empirical testing. When testing the existence and nature of the link, an increase and a decrease in the real effective exchange rate represent currency depreciation and appreciation, respectively. The relationship between the real effective exchange rate and unemployment was tested by using a conventional approach. Furthermore, this paper analyzes the country-specific relationship for ten European post-transition countries by taking into account potential changes in relation to time and frequency. Pentecost and Zarzosa Valdivia (2016) provide a literature overview pointing out the problem of endogeneity in the interrelationship between the real effective exchange rate and unemployment. Therefore, the real effective exchange rate might be a leading variable affecting the unemployment rate in a country or a lagging variable affected by the unemployment rate in a country. A wavelet coherence approach employed in this paper overcomes the issue and illustrates the relation that might be changing over the time and frequency domain.

The reminder of the paper is organized as follows: Section 2 briefly summarizes the existing literature related to the topic under consideration. Section 3 provides research data and the methodology employed, while Section 4 gives empirical results and discussion. The final section provides an overview of the main research findings.

2. Brief review of the related literature

The baseline theoretical model for this paper relies on the well-known Phillips curve that assumes a negative relation between inflation and unemployment in a country. Empirical literature has repeatedly questioned the Phillips curve in the last decades. However, this paper is focused on the relationship between unemployment and the real effective exchange rate as a more comprehensive measure of a country's competitiveness. Horváth and Magda (2018) examined the relationship between inflation and employment across European Union (EU) member countries and pointed out that the Philips curve has completely diminished nowadays. Based on the Phillips curve, D'Adamo and Rovelli (2015) illustrated that different labor market institutions across EU countries respond differently in terms of inflation to unemployment and exchange rate shocks. Schmitt-Grohé and Uribe (2016) pointed out that a currency peg and free capital mobility affect sovereign borrowing during periods of expansion and high unemployment rates during periods of contraction, respectively. Nucera (2017) examined the dynamics of unemployment and effects on exchange rate fluctuations pointing out that lower growth in the unemployment rate appreciates currency of a country, while higher growth in the unemployment rate causes currency depreciation. Devereux and Yu (2017) suggested that in normal times, alternative exchange rate policies do not affect the economy differently. However, in periods of crisis, the effects on the real economy were more adverse under a pegged exchange rate regime. Geerolf (2019) examined the Phillips curve under different exchange rate regimes and found that inflation and unemployment correlated negatively under fixed exchange rate regimes, whereas the relationship does not hold under flexible exchange rate regimes. However, the results pointed out a negative correlation between real exchange rate appreciation and unemployment under fixed and flexible rate regimes as well. Benazić and Rami (2016) employed the bounds testing approach and found that Croatian monetary policy is limited when it comes to reducing unemployment. Andor (2016) pointed out divergences developed within the euro area when considering common unemployment insurance as a possible measure to make the single currency sustainable. Mosteanu (2017) pointed out that pegging the currency to the euro increases investor confidence and consequently the level of investment in Bulgaria and Romania, which results in creating new job opportunities and decreasing the unemployment rate. Saadaoui (2018) examined peripheral countries of the EMU and pointed out that due to internal devaluations the peripheral countries have managed to reduce their exchange rate misalignments. Effects from the

real effective exchange rate to unemployment are often referred to in the literature as real exchange rate pass-through. Usman and Elsalih (2018) and references cited therein pointed out an ambiguous relationship between real effective exchange rates and unemployment. A consequence of real effective exchange rate depreciation are cheaper exports and more expensive imports. Hence, a country may increase the quantity of exports and production accompanied with increased employment. In the case of labor market rigidity and high bargaining power of employees, real depreciation of national currency might correspond with an increase in wages that reduce the earnings of companies. Real depreciation of the real exchange rate might have detrimental effects on a country's unemployment rate in the case of highly dollarized economies (Galindo et al., 2007). Some countries considered in this research joined the EMU within the period under study, whereas economies of others are highly dollarized (Bošnjak, 2018). Furthermore, there might be effects from unemployment to the real effective exchange rate as well. An increase in employment increases a country's productivity and consequently national currency appreciation. Hence, the relationship between real effective exchange rates and unemployment might be ambiguous and different over time as well as for individual countries. The empirical literature on the intersection between the real effective exchange rate and unemployment is scarce, especially for the group of countries considered in this paper. Furthermore, some of the sample countries are members of the EMU, while others are being considered for membership. Stoupos and Kiohos (2017) analyzed conditions from the perspective of the single currency area and found that Croatia, Czechia, and Hungary are not ready to join the euro area, while Poland and Romania were already aligned with the euro fluctuations. The aim of this paper is to make a step forward towards filling a gap in the literature and shed some light on the relationship between the real effective exchange rate and unemployment in European post-transition countries.

3. Research data and methodology

The research data sample consists of monthly unemployment rate data expressed as a percentage of active population and the real effective exchange rate index (2010=100) for 19 trading partners (the euro area) from 2000M1 to 2019M6. The sample data were retrieved from Eurostat for ten European post-transition countries including Bulgaria, Croatia, Czechia, Estonia, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia. Unemployment trends are illustrated in Figure A1 in the Appendix, while descriptive statistics is summarized in Table 1.

Table 1 Descriptive statistics for the unemployment rate from 2000M1 to 2019M6

	Bulgaria	Czechia	Croatia	Latvia	Lithuania
Min.	4.4	1.7	5.9	5.1	3.7
1st qtr.	6.8	4.8	10.6	8.7	7.1
Median	10.4	6.8	13.6	11.2	10.7
Mean	10.6	6.2	13.1	11.5	10.8
3rd qtr.	12.8	7.7	15.4	13.8	13.8
Max.	20.7	9.6	19.5	21.5	19.1
	Poland	**Romania**	**Slovenia**	**Slovakia**	**Estonia**
Min.	4.7	3.7	4.0	5.3	3.9
1st qtr.	7.4	6.1	5.8	10.7	6.2
Median	9.0	6.8	6.6	13.8	8.6
Mean	9.8	6.6	6.9	13.5	9.1
3rd qtr.	12.2	7.4	8.1	17.2	11.4
Max.	17.9	9.5	11.3	20.2	19.7

Source: Author's calculation based on Eurostat data

As can be seen in Table 1, Croatia and Slovakia experienced the highest average unemployment rate in the period from 2000M1 to 2019M6, while Czechia and Slovenia recorded the lowest average unemployment rate in the said period. As illustrated in Table 1, the unemployment rate in other countries ranges between these values. Figure A2 in the Appendix illustrates the development of the real effective exchange rate index for 19 trading partners (the euro area). An increase in the real effective exchange rate and a decrease in the real effective exchange rate represent real depreciation and real appreciation, respectively. Table 2 provides descriptive statistics for the real effective exchange rate index for 19 trading partners (the euro area).

Table 2 Descriptive statistics for the real effective exchange rate (2010=100) from 2000M1 to 2019M6

	Bulgaria	Czechia	Croatia	Latvia	Lithuania
Min.	67.3	67.9	85.5	80.7	79.9
1st qtr.	79.0	82.0	93.3	89.9	88.4
Median	94.8	93.1	96.1	99.8	99.6
Mean	89.7	90.5	95.3	95.9	95.6
3rd qtr.	98.5	99.1	97.3	101.1	101.2
Max.	101.8	107.5	101.4	105.3	104.1
	Poland	**Romania**	**Slovenia**	**Slovakia**	**Estonia**
Min.	77.6	76.0	93.0	56.3	80.8
1st qtr.	92.1	87.0	95.4	74.0	87.4
Median	95.5	97.3	98.2	99.8	99.3
Mean	95.6	94.9	97.5	88.2	97.0
3rd qtr.	98.6	100.8	99.3	101.1	105.2
Max.	116.5	116.4	100.8	103.8	110.3

Source: Author's calculation based on Eurostat data

As illustrated in Table 2, the highest average real effective exchange rate index for 19 trading partners (the euro area) was recorded in Slovenia and Estonia, while the lowest average real effective exchange rate index for 19 trading partners from the euro area is recorded in Slovakia and Bulgaria. After data sample presentation and description, the research starts from an approach that is more conventional. Based on the research data presented in this section, the standard Pearson correlation coefficient between unemployment and the real effective exchange rate index for 19 trading partners from the euro area is calculated for each country. The Pearson correlation coefficient is calculated to enable a comparison of results obtained by using different approaches. The recent empirical literature in the fields of economics and finance recognized the advantages of a wavelet-based approach followed in this paper (Demir et al., 2020; Karabulut et al., 2020; Karabulut et al., 2020a; Rathinasamy et al., 2017; Rua, 2012; Vacha & Barunik, 2012; Xu, 2019). Unlike conventional approaches to time series analysis, a wavelet-based approach enables insights into time and frequency domains. The research in this paper employs the Morlet wavelet given in equation (1):

$$\psi^M(t) = \frac{1}{\pi^{\frac{1}{4}}} e^{i\omega_0 t} e^{\frac{-t^2}{2}}, \quad (1)$$

where t represents time and ω_0 is a central frequency controlling the number of oscillations set to six as is often the case in comparable economic studies (Vacha & Barunik, 2012). A complex Morlet wavelet is a valuable advantage allowing for a time-dependent amplitude and the phase for different frequencies. The continuous wavelet transform is presented in equation (2):

$$W_x(\tau, s) = \frac{1}{\sqrt{s}} \int_{-\infty}^{\infty} x(t) \psi\left(\frac{t-\tau}{s}\right) dt, \quad (2)$$

where $x(t)$, s and τ represent the observed time series, the scale and the location determining the po-

sition of the wavelet, respectively. Following wavelet transform equation (2), the observed time series $x(t)$ is decomposed in terms of wavelets. After that, the paper studies the size and significance of a local correlation between the real effective exchange rate and unemployment as two time series. Prior to examining the size and significance of a local correlation between the real effective exchange rate and unemployment as two time series, the cross wavelet transform and cross wavelet power need to be explained. The cross wavelet transform of two time series $x(t)$ and $y(t)$ is given in equation (3):

$$W_{xy}(\tau,s) = W_x(\tau,s)W_y(\tau,s)\,, \tag{3}$$

where $W_x(\tau,s)$ represents the continuous wavelet transform of the observed time series $x(t)$, and $W_y(\tau,s)$ denotes the complex conjugate continuous wavelet transform of the observed time series $y(t)$. Cross wavelet power is given as $|W_{xy}(\tau,s)|$. The squared wavelet coherence coefficient is presented in equation (4):

$$R^2(\tau,s) = \frac{\left|S\left(s^{-1}W_{xy}(\tau,s)\right)\right|^2}{S(s^{-1}|W_x(\tau,s)|^2)S\left(s^{-1}|W_y(\tau,s)|^2\right)}, \tag{4}$$

where S represents a smoothing operator. Just like the Pearson squared correlation coefficient, the squared wavelet coherence coefficient ranges from zero to one. Furthermore, wavelet coherence analysis provides phase differences between the considered time series. The wavelet coherence phase difference is provided in equation (5):

$$\varphi(\tau,s) = tan^{-1}\left(\frac{\Im\left(W_{xy}(\tau,s)\right)}{\Re\left(W_{xy}(\tau,s)\right)}\right), \tag{5}$$

where $\Re$ and $\Im$ represent the real part and the imaginary part of the cross wavelet transform in equation (3), respectively. A phase difference is illustrated by arrows. A zero phase difference indicates that the considered time series are positively correlated and move together. The arrows pointing right indicate a positive correlation, whereas the arrows pointing left represent a negative correlation. The arrows pointing up indicate that the first time series leads the second by the right angle, and the arrows pointing down indicate that the second time series leads the first by the right angle. Consequently, the arrows can indicate a combination of positions.

4. Empirical results and discussion

Based upon the empirical strategy defined in the section entitled Research data and methodology, the Pearson correlation coefficient (PC) and the corresponding p – values (p) are calculated firstly and the results are summarized in Table 3.

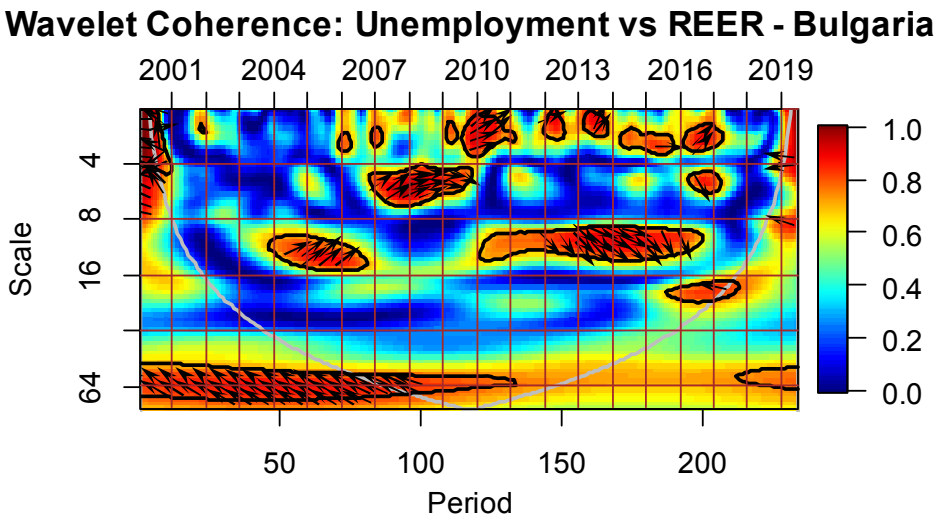
Table 3 Pearson correlation coefficient for the real effective exchange rate and unemployment

	Croatia	Czechia	Romania	Latvia	Lithuania
PC	-0.457	-0.619	-0.445	0.182	-0.118
p	0.000	0.000	0.000	0.005	0.072
	Estonia	**Bulgaria**	**Slovenia**	**Slovakia**	**Poland**
PC	-0.406	-0.633	0.369	-0.781	0.103
p	0.000	0.000	0.000	0.000	0.116

Source: Author's estimates

Following the results in Table 3 and holding significance at 5%, no significant correlation was found in the cases of Lithuania and Poland. Though with the difference in sign and magnitude, a significant correlation was found for other sample countries. In the cases of Latvia and Slovenia, the Pearson correlation coefficient was positive and not in line with theoretical assumptions, while in the cases of Croatia, Czechia, Romania, Estonia and Bulgaria, the correlation coefficient was negative. The highest degree of correlation was found in the cases of Slovakia, Bulgaria and Czechia. In what follows, deeper insights were provided into the wavelet coherence approach. The results for Bulgaria are illustrated in Figure 1.

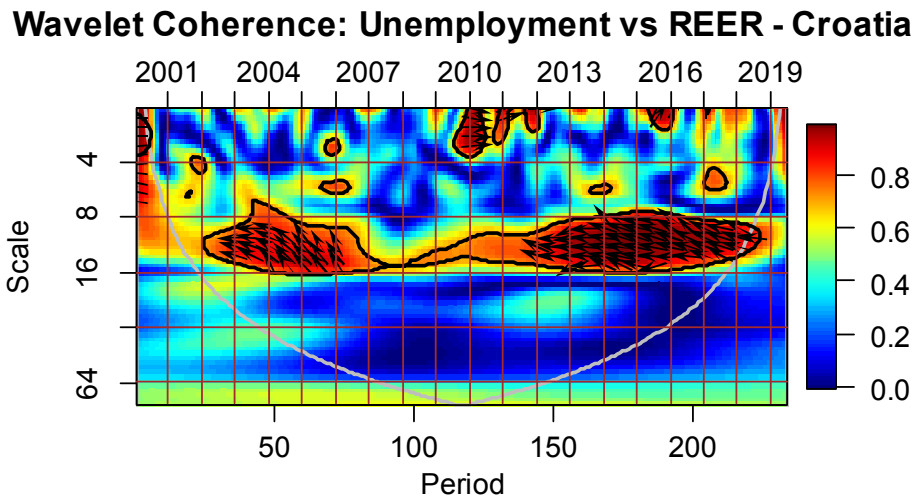
Figure 1 The case of Bulgaria



Source: Author's estimates

The time period under consideration is displayed on the horizontal axis. The vertical axis shows the scale - the lower the scale, the higher the frequency. Regions in the time-frequency domain, where the unemployment and real effective exchange rate series co-move, were identified by wavelet coherence. As can be seen on the right-hand side of the figure, regions colored dark red denote a high degree of correlation, whereas the area colored blue denotes a lower degree of correlation between the observed series. The areas outside of the bounded regions were not significant at the 5% level. An arrow in the figure represents the leading or the lagging phase in correlation between the series under consideration. Furthermore, larger scales and lower scales represent long-term and short-term co-movement, respectively. As can be seen in Figure 1, there was a prominent correlation on a larger scale from the beginning of the observation period up to year 2010. The arrows pointing to the left (a negative correlation) and up (unemployment as a leading variable) indicate that the unemployment rates and the real effective exchange rates in Bulgaria were in anti-phase, while the unemployment rate was the leading variable. Therefore, for the first ten years of the observed data sample in Bulgaria there was a decrease in the unemployment rate (Figure 2) that was followed by depreciation of the real effective exchange rate (Figure A2). Afterwards, a significant and prominent correlation was indicated in the middle of scale (between 8 and 16) and a positive correlation with the real effective exchange rate as a leading series. Therefore, after the 2008 crisis, real depreciation of the exchange rate was followed by an increase in unemployment in Bulgaria. Following the same approach, the results obtained for Croatia were illustrated in Figure 2.

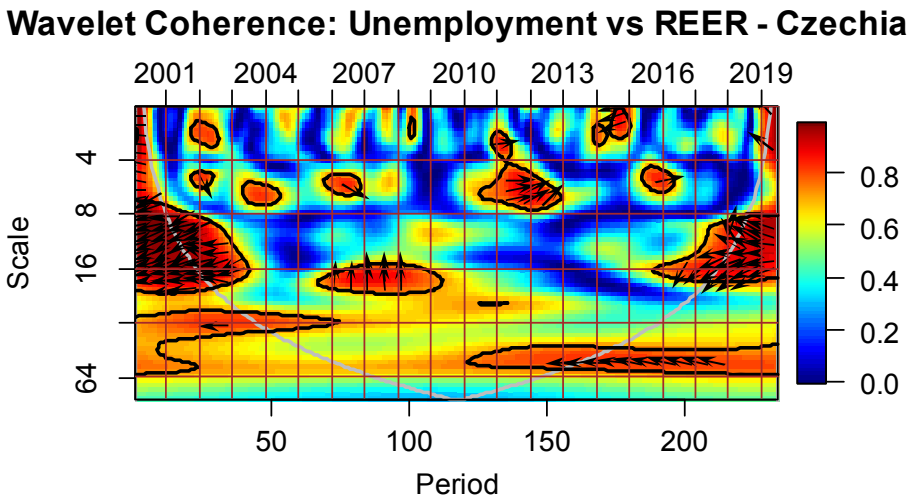
Figure 2 The case of Croatia



Source: Author's estimates

As indicated in Figure 2, in the case of Croatia, a significant and high correlation was identified in the middle of scale (between 8 and 16). However, the correlation was less prominent during the 2008 crisis period. The correlation was negative and the unemployment rate was the leading variable during the periods of significant correlation. Therefore, a decrease in unemployment was followed by depreciation until the 2008 crisis. After that, there was an increase in the unemployment rate that was followed by real appreciation of the exchange rate. The results for Czechia are illustrated in Figure 3.

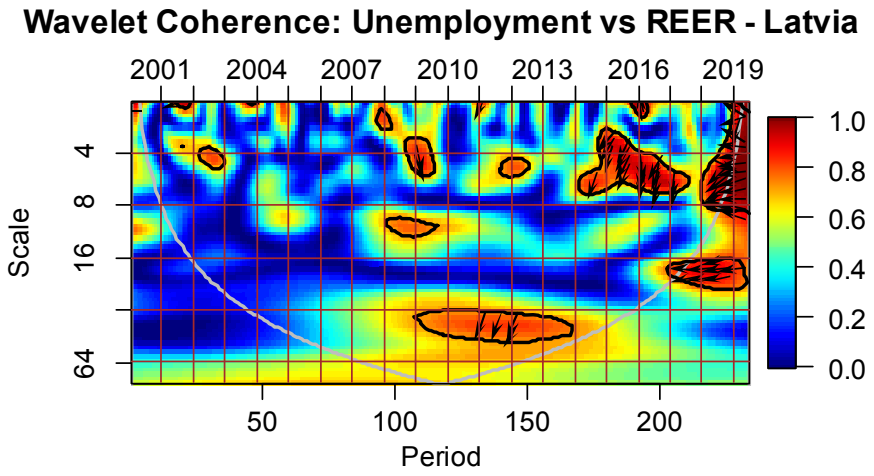
Figure 3 The case of Czechia



Source: Author's estimates

By looking at the results in Figure 3, one can observe a pattern similar to the case of Croatia by the 2004. There was no significant correlation in the period from 2009 to 2010. After 2010, there was a negative correlation but with the two of the observed variables interchanging their leading positions. The unemployment rate was a leading variable at a lower frequency domain and there was depreciation in its real terms while unemployment was decreasing. The results for Latvia are illustrated in Figure 4.

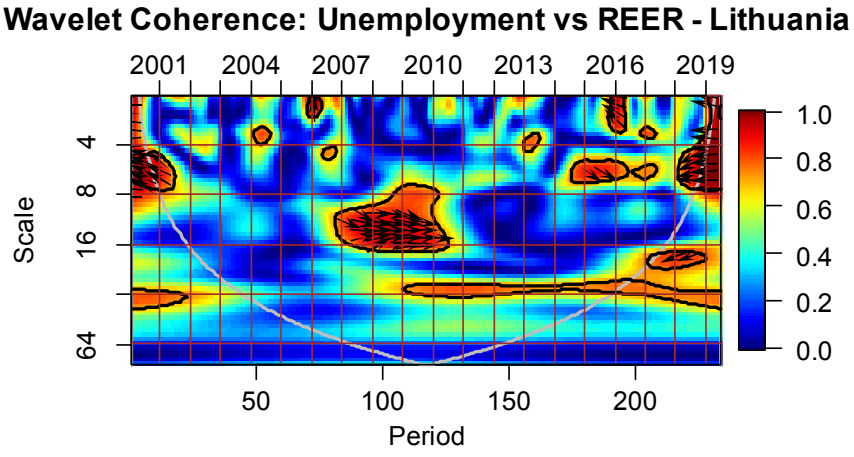
Figure 4 The case of Latvia



Source: Author's estimates

As illustrated in Figure 4, no significant correlation was found in the case of Latvia by the year 2009. After that, the correlation was negative with the real effective exchange rate as the leading variable. Therefore, real depreciation of the exchange rate was followed by a decrease in the unemployment rate. Latvia has been a member of the EMU since 2014, which corresponds to more prominent co-movements that can be seen in Figure 4. Figure 5 illustrates the case of Lithuania.

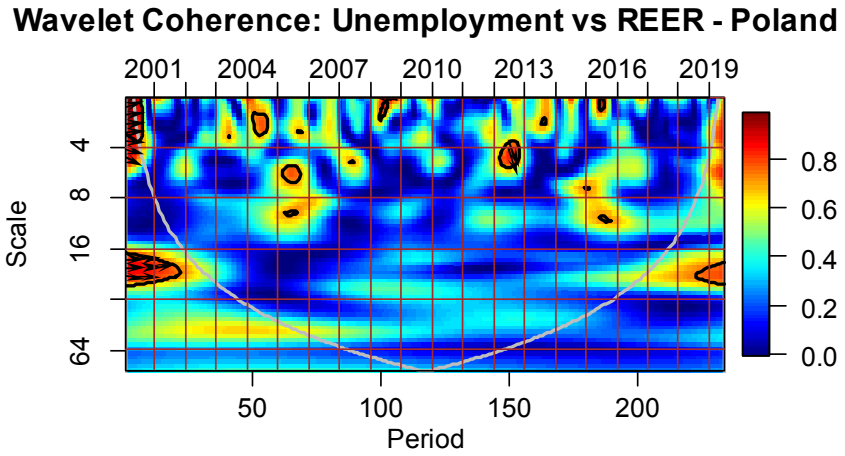
Figure 5 The case of Lithuania



Source: Author's estimates

As can be seen in Figure 5, at the beginning of the observation period there was a significant and negative correlation with unemployment as the leading variable. A decrease in unemployment was followed by real depreciation of the exchange rate. From 2007 to 2011, the correlation coefficient turned to its positive values and the real effective exchange rate and unemployment developed simultaneously. After that, there was a mixture of relationships in the case of Lithuania. Lithuania has been a member of the EMU since 2015 and no difference in co-movements can be detected as a result of EMU membership. The results for Poland are illustrated in Figure 6.

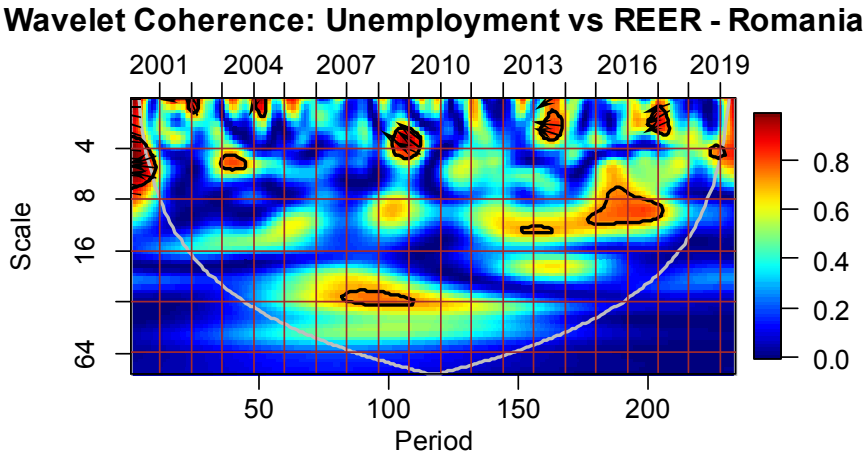
Figure 6 The case of Poland



Source: Author's estimates

As illustrated in Figure 6, in the case of Poland, there was prominent, significant and simultaneous development between the two of the observed series in the first two years of the observation sample. After that, no significant correlations were detected. The results for Romania are presented in Figure 7.

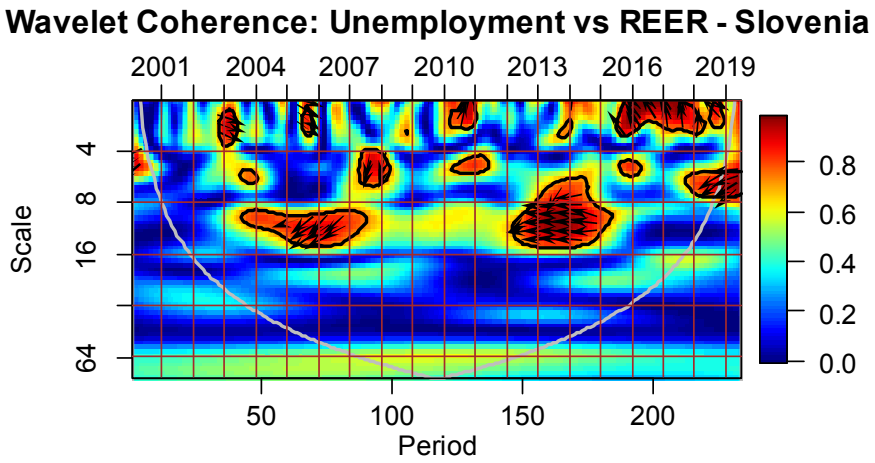
Figure 7 The case of Romania



Source: Author's estimates

As illustrated in Figure 7, in the case of Romania, there are periods of significant correlations and the sign was negative with unemployment as a leading variable. However, the periods of significant correlation did not last for more than two years continuously. The results for Slovenia are illustrated in Figure 8.

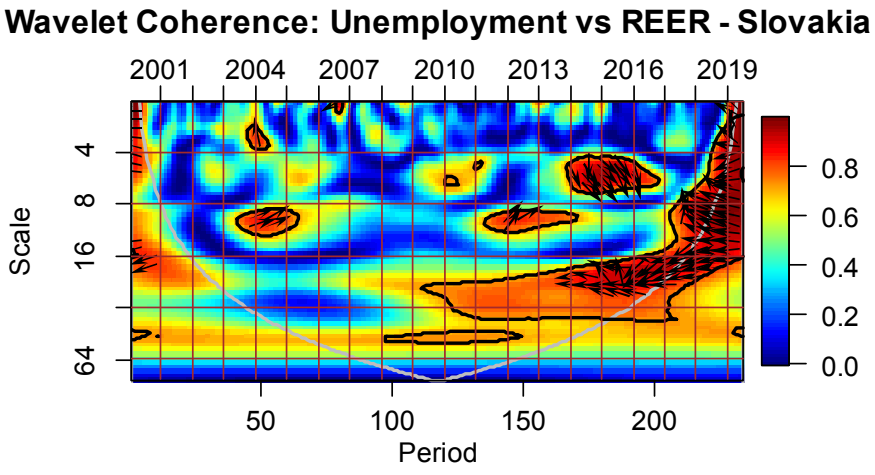
Figure 8 The case of Slovenia



Source: Author's estimates

It can be seen in Figure 8 that there were periods of significant and high correlations. Prior to 2004, the correlations were positive with real exchange rate depreciation as the leading variable. After 2004, the correlation was negative and on a larger scale one can see synchronized anti-phase movements or the real effective exchange rate as the leading variable. Slovenia has been a member of the EMU since 2007 and results in Figure 8 illustrate a theoretically consistent relationship during the EMU membership period. Figure 9 illustrates the case of Slovakia.

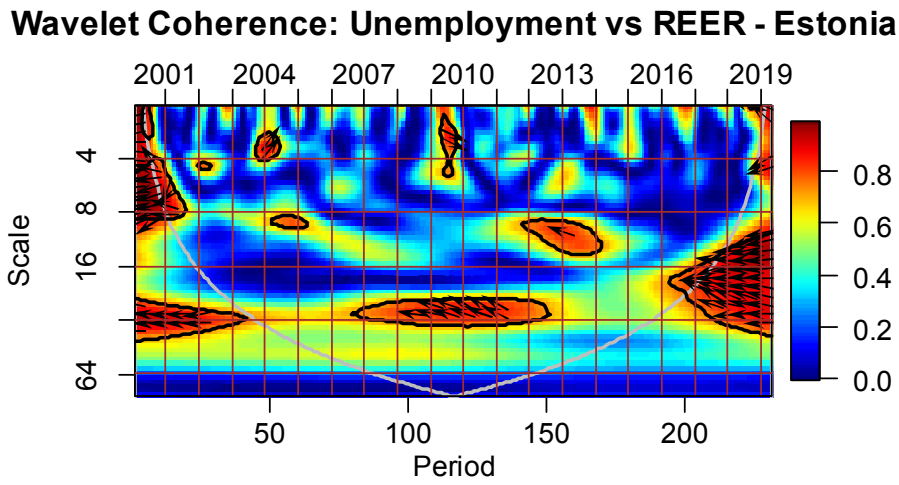
Figure 9 The case of Slovakia



Source: Author's estimates

Figure 9 illustrates a significant and prominent correlation around the year 2004. At that time, a correlation was positive and the unemployment rate was the leading variable. After the 2008 crisis, the correlations turned to be negative. The unemployment rate and the real effective exchange rate were in anti-phase, while the co-movements were synchronized or the unemployment rate was the leading variable. Slovakia has been a member of the EMU since 2009, which corresponds to a more prominent and significant relationship between the real effective exchange rate and unemployment. Figure 10 illustrates the case of Estonia.

Figure 10 The case of Estonia



Source: Author's estimates

Figure 10 illustrates a significant correlation of high magnitude during the whole observation period, though at different scales. The unemployment rate and the real effective exchange rate were in anti-phase all the time. The unemployment rate was a leading variable or the co-movements were synchronized. Estonia has been a member of the EMU since 2011 and no specific change in co-movements was identified since EMU membership. Faďoš and Bohdalová (2019) examined unemployment gender inequality and found country-specific relations between the unemployment rates and unemployment gender inequality. The research furthermore suggests that the observed panel data structure hysteretic nature of unemployment for 27 European Union countries was rejected, indicating no long memory in unemployment for the considered sample countries. In the first part of the observation period a decrease in the unemployment rate was followed by depreciation of the real effective exchange rate in the case of Bulgaria, Croatia, Czechia and Lithuania. These findings might potentially suggest pro-cyclical monetary policy. After the 2008 crisis, real depreciation of the exchange rate was followed by an increase in unemployment in Bulgaria, while in Croatia there was an increase in the unemployment rate followed by real appreciation of the exchange rate. Real depreciation of the exchange rate was followed by a decrease in the unemployment rate in Latvia. The cases of Croatia and Latvia were in line with the theoretical assumption, while the case of Bulgaria can be explained with bargaining power documented as recognized by Vasilev (2020). In the cases of Estonia, Slovakia and Romania, empirical results were in line with baseline theory. In the case of Poland, no clear conclusion can be drawn from the obtained results. In Slovenia, depreciation of the real effective exchange rate was followed by an increase in the unemployment rate prior to 2004 when Slovenia joined the EMU. Following Galindo et al. (2007), depreciation of the real effective exchange rate might increase unemployment rates in highly dollarized economies. The relationship between the real effective exchange rate and the unemployment rate in Slovenia was in line with the theory.

5. Conclusion

Research results presented in this paper point out several conclusions. Firstly, research results obtained by a conventional approach suggest no significant correlation between the real effective exchange rate and unemployment in the cases of Poland and Lithuania. In the cases of Latvia and Slovenia, the standard correlation coefficient was positive and therefore not theoretically consistent. In other six considered countries correlation coefficients were negative, which supported the theoretical assumption. Wavelet coherence analysis employed in this paper revealed a variety of co-movements depending on a specific country, point in time and frequency considered. Generally, co-movements were more prominent on a larger scale or a lower frequency, pointing out possible alignments of the real effective exchange rate and unemployment to the relationship assumed by the theory in the long run. Furthermore, the relationship was broken during the 2008 crisis period. Eventually, the assumed relationship between the real effective exchange rate and unemployment holds for most of the membership period in all of the EMU members considered. In the first part of the observation period, a decrease in the unemployment rate was accompanied by depreciation of the real effective exchange rate in the cases of Bulgaria, Croatia, Czechia and Lithuania, suggesting pro-cyclical monetary policy. Prior to joining the EMU, in Slovenia, depreciation of the real effective exchange rate was accompanied by an increase in unemployment. During the crisis that started in 2008 no statistically significant relationship between the real effective exchange rates was found. After the crisis, this relationship was mostly found to be in line with the theoretical assumption, with the exception of Bulgaria, where depreciation of the real effective exchange rate corresponded to an increase in unemployment rates, and Poland, where a significant correlation between variables under consideration was not found. The research presented in this paper illustrated a comprehensive overview of the relationship between the real effective exchange rate and unemployment in post-transition Europe. Generally, based on empirical findings from this paper, depreciation of real effective exchange rates might be used as a policy instrument to boost employment within sample countries under study. At the same time, our results call for further research to reveal the mechanism of interaction through country-specific research and including other variables that may play a role, like trade openness and economic growth of a country or any other specifics of a country that may affect the relationship.

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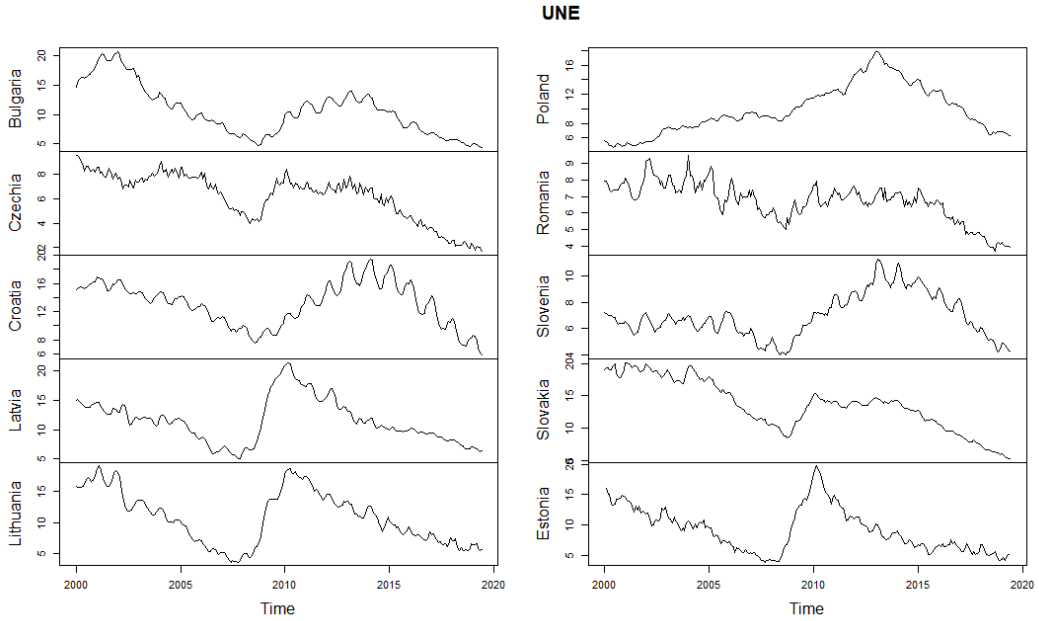
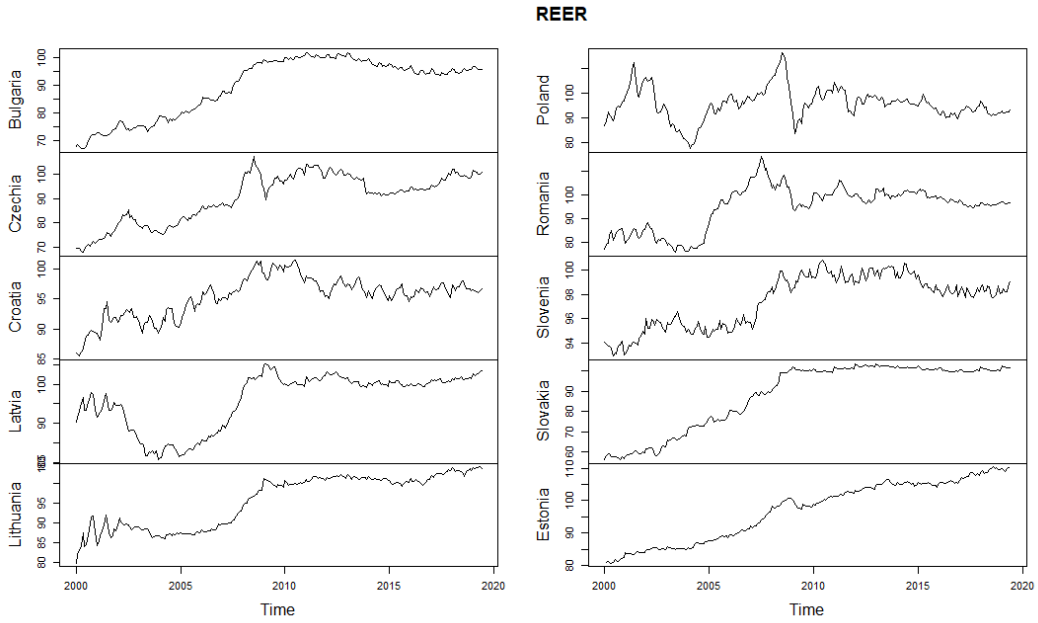
Appendix

Figure A1 Unemployment rate trends



Source: Eurostat, adapted by the author

Figure A2 Real effective exchange rate (2010=100) – an increase represents depreciation



Source: Eurostat, adapted by the author

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ACCEPTABILITY AND PERCEPTION OF ENVIRONMENTALLY FRIENDLY PRODUCTS BY STUDENT POPULATION IN CROATIA

Abstract

Purpose: The purpose of this paper is to point out the perceptions of the student population toward environmentally friendly products and examine if they are willing to pay higher prices for those products.

Methodology: The research conducted in the second half of 2020 included the student population, i.e. a sample of 114 respondents. The close-ended questions offered answers ranging from the level of knowledge related to general concepts to the factors related to purchasing decisions. Data were collected through an online survey. The collected data were analyzed by statistical software packages MedCalc Statistical Software version 19.1.7 and SPSS.

Results: Respondents are familiar with the concepts of sustainable development, a socially responsible business and green consumers, which they define correctly. There are no major differences between male and female respondents. When choosing a product, respondents of both genders mention product quality as the most important factor. The second most important factor is the price, followed by the brand of the product and the environmental friendliness of the product. The brand of the product and environmental acceptability of the product are somewhat more important to male respondents than to female respondents. Corporate social responsibility of the company that produces a product is described as least important by respondents of both genders when choosing a product.

Conclusion: It is evident that the student population changed their attitudes towards environmentally friendly products compared to year 2009, but the trend has not changed since 2015. It is a market segment that takes into account this factor when choosing a product.

Keywords: Green products, green consumers, environmental protection, sustainable development

1. Introduction

The issues of sustainable development, environmental protection and climate change have been in the public spotlight for a long time. There is no doubt that human activity influences climate change, and consumer habits are an important segment of this action. Almost thirty years ago, the term "green consumers" was coined in the United States to denote environmentally conscious consumers, i.e. consumers who prefer environmentally friendly products. Today, this market segment is the subject

of market segmentation research and research on various aspects of sustainability that, in addition to the environmental dimension, also include the social and the economic dimension. Research based on various aspects of sustainable development points to the fact that consumers still pay most attention to the environmental dimension (Hosta & Žabkar, 2016).

Together with employees, consumers are one of the most important contributors to any business entity because their decisions significantly affect business results and profitability. Therefore, it is extremely important at the level of business entities to think about adjusting the product portfolio to meet the requirements of environmentally conscious consumers.

Previous research in the Republic of Croatia has defined environmentally conscious consumers on the Croatian market as individuals over the age of 55, with a Bachelor's degree or higher, who live in marital union and are willing to pay a 20% higher price for environmentally friendly products (Ham, 2009).

The aim of this paper is to investigate the attitudes of the student population towards environmentally friendly products and to explore the level of knowledge of the concepts of sustainable development, green consumers and socially responsible businesses.

As defined in previous research ten years ago, the student population belongs to the least environmentally conscious group of people. Nevertheless, research conducted in 2015 (Ham et al., 2015) found that the student population understands the importance of corporate social responsibility.

2. Literature review

Brown and Dacin (1997) empirically confirmed the existence of a link between consumer knowledge of a business entity and consumer reaction to the products of the same business entity. Sen and Bhattacharya (2001) confirmed that consumer reactions are stronger and more sensitive to negative information related to corporate social responsibility. All consumers react to negative information, and only those consumers who monitor and support a socially responsible business react to positive information about a socially responsible business. Singh et al. (2008) conducted research related to consumer perceptions of products and corporate social responsibility. The result of their research showed that consumers do not have enough information about socially responsible business entities. In their research, Luo and Bhattacharya (2006) confirmed a positive relationship between a socially responsible business, consumer satisfaction and the market value of a business entity. However, they pointed out that consumers expect high quality products and services.

Hosta and Žabkar (2016) pointed out in their research that consumers pay most attention to the ecological dimension of sustainable development. If we look at the research related to sustainable development and environmentally friendly products, research results indicate that certain consumers are reluctant to buy environmentally friendly products because they consider them less efficient and there is a gap between their general attitudes about environmentally friendly products and actual shopping habits (Luchs et al., 2010). Haws et al. (2014) developed a system for measuring consumer attitudes towards environmentally friendly products, i.e. the green scale, and emphasized the existence of differences between different cultures, but also on a personal level. Bratt et al. (2014) conducted research in Germany and Norway that found differences in consumer behavior in different situations such as behavior at home, car-use behavior, and vacation behavior.

Leko Šimić and Štimac (2010) conducted research related to consumer opinion on corporate social responsibility in the Republic of Croatia. The research results showed that consumers do not have enough information on this topic and that they do not trust the advertising messages emphasizing socially responsibility of business entities. A year later, in a new study, they emphasized that consumers in the Republic of Croatia are not ready to unconditionally buy products produced by business entities that are socially responsible (Leko Šimić & Štimac, 2011). In her research into the segmentation of green consumers in the Republic of Croatia conducted in 2009, Ham (2009) stated that people aged 15 to 24 are least interested in environmentally friendly products, but a recent research study conducted in 2015 shows that students perceive the importance of corporate social responsibility (Ham et al., 2015). Anić and Antolović (2019) concluded in their research that generation Z wants to be informed about and aware of social responsibility.

The concept of sustainable development has been in use since 1987, and the World Commission on Environment and Development (WCED) defines it as "development that meets the needs of the current generation, but not at the expense of future generations" (United Nations, 1987). The basic principles of conduct relating to business entities related to sustainable development were defined in 1992 in the Rio Declaration on Environment and Development (United Nations, 1992). The Organization for Economic Cooperation and Development (OECD, 2011) emphasizes in the guidelines for business entities that the goals in the segment of environmental and natural resources management should be systematically implemented at the strategic level and aim at continuous improvement. In this way, businesses entities take an active role in protecting the environment and nature from negative impacts as a result of their economic activity.

At the level of business entities, Črnjar defines sustainable development as a process in which less and less resources are spent to meet the needs of consumers and, accordingly, the environment is less and less polluted (Črnjar, 2002, p. 202). Sustainable development consists of three parts that include economic, social and environmental responsibility. All three parts of sustainable development form an important component at the level of business entities that should focus more on creating long-term values for all participants.

Consumers who prefer to buy environmentally friendly products are called green consumers (Carroll & Buchholtz, 2015, p. 453). Gardyn (2001) defines green consumers as young, well-paid, highly educated, predominantly women, i.e. white collars. Ham (2009) defines green consumers on the Croatian market as individuals over the age of 55, with a Bachelor's degree or higher, who live in marital union and are willing to pay a 20% higher price for environmentally friendly products. The shopping habits of green consumers are based on the 3Rs, i.e. reduce, reuse and recycle. To reduce means to avoid buying products that create waste and pollute the environment, reuse means buying reusable products made of and/or packaged in recycled material, and recycle is the third choice after the first two (Makower et al., 1990).

According to research conducted by market research companies, two segments have been identified depending on the strength of their preferences for environmentally friendly products. "Light green" consumers mainly make impulsive decisions at the point of sale regarding environmentally friendly products, and "dark green consumers" already take into account environmentally friendly products when planning their purchase (Carroll & Bucholtz, 2015). Subsequent research in Germany and Norway (Bratt et al., 2014) points to the fact that there are differences in green consumer behavior in terms of environmentally friendly behavior at home, when using a car, and on vacation. Environmentally friendly behavior is mostly seen at home and it is in line with general attitudes towards environmental responsibility. Car-use and vacation behavior are not in line with environmental responsibility.

There are obvious differences with respect to the age of consumers, income level, nationality, legislation, etc. Twenty years after writing the book Green Consumer, Joel Makower (2010) looked at the size of this market segment. He believed that the number of green consumers has not increased drastically since 1990, although expectations were different. He stressed the lack of information on environmentally friendly products and consumer distrust in the quality of such products as the main reasons.

Consumers encounter numerous labels in the market related to environmental friendliness of the product. Most of the labels are developed by business entities that produce such products, mostly for marketing purposes, so consumer distrust is expected and understandable. The EU Ecolabel is one of the labels guaranteeing consumers that the product or service is of high quality and environmentally friendly. In order to receive the EU Ecolabel, a product or service must comply with a tough set of criteria. In the first place, these environmental criteria have to be set by a panel of experts from a number of stakeholders, including consumer organizations and industry. "The EU Ecolabel scheme is part of the sustainable consumption and production policy of the Community, which aims at reducing the negative impact of consumption and production on the environment, health, climate and natural resources. The scheme is intended to promote those products which have a high level of environmental performance through the use of the EU Ecolabel." (European Commission, 2009). As a label, the EU Ecolabel is of great importance in the process of informing consumers because consumers have expectations in relation to harmonization of business operations and social values, and if they believe that the business entity behaves responsibly, there may

be positive changes in their shopping habits and motives (Ellen et al., 2006).

Irawan and Darmayanti (2012) conducted a survey among a sample of 200 students in Jakarta and confirmed that environmental care, environmental responsibility, and environmental awareness are significant factors influencing students' shopping habits.

3. Research problem

The main research questions are:

1. Were there any changes in student population behaviour regarding environmentally friendly products since the last research carried out in 2009?
2. Are they willing to pay a higher price for those products?

The answers to these questions may determine future strategies by companies regarding environmentally friendly products.

4. Research methodology

In order to collect data, the authors used an online survey and questionnaire with close-ended questions. Respondents were offered several answers to each question. The collected data were analyzed by means of statistical methods. The category data are presented in absolute and relative frequencies. Differences in categorical variables were tested by the $\chi 2$ test and, if necessary, by the Fisher exact test. The significance level was set to Alpha = 0.05. MedCalc Statistical Software version 19.1.7 (MedCalc Software Ltd, Ostend, Belgium, 2020)[1] and SPSS (IBM SPSS Statistics for Windows, Version 21.0 Armonk, NY: IBM Corp., released 2013) were used for statistical analysis.

The aim of the research was to collect data related to the attitudes of the student population about environmentally friendly products. Accordingly, it is focused on two areas. The first is related to general attitudes towards and knowledge of the concepts of sustainable development, corporate social responsibility and green consumers. The second area is related to the key factors in product selection and whether consumers are willing to pay a higher price for environmentally friendly products.

The research was conducted in the period from May to June 2020 on a sample of 114 full-time and part-time freshmen and sophomores at the College of Slavonski Brod. Table 1 shows the structure of respondents by gender and income of the family household. The sample has more male than female respondents, i.e. 90 (78.9%). Fifty respondents (43.9%) fall into the HRK 5,000 to HRK 7,999 income range, 20 respondents (17.5%) earn less than HRK 5,000, whereas 7 respondents (6.1%) earn more than HRK 14,000 per month.

Table 1 Basic characteristics of respondents

	Number of respondents (%)
Gender	
Male	90 (78.9)
Female	23 (20.2)
Unanswered	1 (0.9)
Amount of household income	
Up to 4,999 HRK monthly	20 (17.5)
From 5,000 to 7,999 HRK monthly	50 (43.9)
From 8,000 to 9,999 HRK monthly	14 (12.3)
From 10,000 to 11,999 HRK monthly	12 (10.5)
From 12,000 to 13,999 HRK monthly	5 (4.4)
More than 14,000 HRK monthly	7 (6.1)
Unanswered	6 (5.3)
Total	114 (100)

Source: Authors

1 https://www.medcalc.org

5. Research results

Respondents are familiar with the concepts of sustainable development, a socially responsible business and green consumers, which they define correctly. There are no major differences between male and female respondents. When choosing a product, respondents of both genders mention product quality as the most important factor. The second most important factor is the price, followed by the brand of the product and the environmental friendliness of the product. The brand of the product and environmental acceptability of the product are somewhat more important to male respondents than to female respondents. When choosing a product, corporate social responsibility of the company that produces a product is described as least important by respondents of both genders. Table 2 shows in detail the results related to the structure of respondents with respect to their gender and according to the knowledge of these concepts and the importance of certain factors in making a purchase decision.

Table 2 Distribution of respondents by gender and their knowledge of sustainable development concepts, socially responsible businesses, and "green" consumers, and in relation to what is most important to them when choosing a product

	Number of respondents (%) by gender			P*
	Male	*Female*	*Total*	
Are you familiar with the term 'sustainable development'?				
Yes	67 (74)	17 (74)	84 (74)	> 0.99
No	22 (24)	6 (26)	28 (25)	
Unanswered	1 (1)	0	1 (1)	
What does the term 'sustainable development' mean to you?				
Growth that keeps pace with environmental and social responsibility	70 (77.8)	15 (65.2)	85 (75.2)	0.21†
A promotional term used for PR companies	6 (6.7)	1 (4.3)	7 (6.2)	> 0.99
A limiting factor for economic growth	8 (8.9)	1 (4.3)	9 (8)	0.68
Overall a positive process	7 (7.8)	4 (17.4)	11 (9.7)	0.23
I'm not sure what that means	13 (14.4)	4 (17.4)	17 (15)	0.75†
Are you familiar with the concept of 'corporate social responsibility'?				
Yes	80 (89)	16 (70)	96 (85)	**0.02**
No	10 (11)	6 (26)	16 (14)	
Unanswered	0	1 (4)	1 (1)	
What does the term 'corporate social responsibility' mean to you?				
Company responsibility for their impact on society	58 (64.4)	17 (73.9)	75 (66.4)	0.39†
Ethics in business	49 (54.4)	14 (61)	63 (55.8)	0.58†
Caring for employees, society and the environment	71 (78.9)	15 (65.2)	86 (76.1)	0.17†
Respect for the interests of all stakeholders including consumers, suppliers and the local community	51 (56.7)	12 (52.2)	63 (55.8)	0.70†
I'm not sure what that term means	3 (3.3)	2 (8.7)	5 (4.4)	0.27
Are you familiar with the term 'green consumer'?				
Yes	64 (71)	18 (78)	82 (73)	0.29
No	25 (28)	4 (17)	29 (26)	
Unanswered	1 (1)	1 (4)	2 (2)	

	Number of respondents (%) by gender			P*
	Male	*Female*	*Total*	
What does the term 'green consumer' mean to you?				
Consumers who have different shopping habits	35 (38.9)	13 (56.5)	48 (42.5)	0.13†
Consumers who have different product selection criteria when choosing a product	18 (20)	9 (39.1)	27 (23.9)	0.06†
Consumers who prefer products that are environmentally friendly	47 (52.2)	15 (65.2)	62 (54.9)	0.26†
Consumers who choose products of companies guided by the principles of sustainable development	33 (36.7)	6 (26.1)	39 (34.5)	0.34†
I'm not sure what that term means	15 (16.7)	2 (8.7)	17 (15)	0.52
What is most important to you when choosing a product?				
Price	62 (68.9)	14 (60.9)	76 (67.3)	0.47
Quality	87 (96.7)	22 (95.7)	109 (97)	> 0.99
Brand	56 (62.2)	13 (56.5)	69 (61.1)	0.62
Socially responsible business of the company that produces the product	41 (45.6)	7 (30.4)	48 (42.5)	0.19
Environmental friendliness of the product	56 (62.2)	13 (56.5)	69 (61.1)	0.62

*Fisher exact test; † $\chi 2$ test
Source: Authors

Respondents' opinions and attitudes towards environmentally friendly products with respect to gender are shown in Table 3. Respondents are willing to pay more for a more environmentally friendly product and this is somewhat more pronounced among female respondents (83%). Both men (54%) and women (65%) are willing to pay 5% or 10% more for an environmentally friendly product. There is a fairly high percentage (23%) of those who did not answer this question. When buying products, as many as 65% of female respondents always or often think about their decision that affects environmental protection. This percentage is also high for male respondents (54%), but still slightly lower than for their female counterparts. Recycling products when buying is mostly thought of sometimes and rarely. Similar results are obtained when it comes to thinking about whether the manufacturer of a particular product is an environmentally responsible company. Sometimes members of both genders are affected by advertising messages about environmentally friendly products.

Table 3 Distribution of respondents by gender and their opinions and attitudes towards environmentally friendly products

	Number of respondents (%) by gender			**P***
	Male	**Female**	**Total**	
Would you pay more for a product that is environmentally friendly?				
Yes	65 (72)	19 (83)	84 (74)	0.70
No	22 (24)	4 (17)	26 (23)	
Unanswered	3 (3)	0	3 (3)	

	Number of respondents (%) by gender			P*
	Male	Female	Total	
How much more are you willing to pay for an organic product?				
5%	23 (26)	8 (35)	31 (27)	0.97
10%	26 (29)	7 (30)	33 (29)	
15%	12 (13)	2 (9)	14 (12)	
20%	5 (6)	1 (4)	6 (5)	
More than 20%	3 (3)	0	3 (3)	
Unanswered	21 (23)	5 (22)	26 (23)	
When buying a product, how often do you think that by choosing the product you personally influence environmental protection?				
Always	23 (26)	8 (35)	31 (27)	0.97
Often	26 (29)	7 (30)	33 (29)	
Sometimes	12 (13)	2 (9)	14 (12)	
Rarely	5 (6)	1 (4)	6 (5)	
Never	3 (3)	0	3 (3)	
Unanswered	21 (23)	5 (22)	26 (23)	
When buying a product, how often do you think that the selected product can be recycled?				
Always	3 (3)	1 (4)	4 (4)	0.71
Often	17 (19)	3 (13)	20 (18)	
Sometimes	38 (42)	12 (52)	50 (44)	
Rarely	24 (27)	7 (30)	31 (27)	
Never	7 (8)	0	7 (6)	
Unanswered	1 (1)	0	1 (1)	
When buying a product, how often do you think about whether the manufacturer is an environmentally responsible company?				
Always	2 (2)	0	2 (2)	0.30
Often	10 (11)	0	10 (9)	
Sometimes	36 (40)	13 (57)	49 (43)	
Rarely	31 (34)	9 (39)	40 (35)	
Never	11 (12)	1 (4)	12 (11)	
How often are your purchasing decisions influenced by advertising messages about environmentally friendly products?				
Always	4 (4)	0	4 (4)	0.29
Often	14 (16)	3 (13)	17 (15)	
Sometimes	45 (50)	11 (48)	56 (50)	
Rarely	20 (22)	9 (39)	29 (26)	
Never	7 (8)	0	7 (6)	
Total	**90 (100)**	**23 (100)**	**113 (100)**	

*Fisher exact test; † $\chi 2$ test
Source: Authors

When choosing a product, regardless of the amount of their monthly income, respondents mention the quality of the product as the most important factor. The second most important factor is environmental friendliness of the product, which is followed by the price and finally the brand of the product. The brand and and environmental acceptability of the product are somewhat more important for the respondents with income up to HRK 4,999 per month. When choosing a product, corporate social responsibility of the company that produces a product is described as least important by all respondents, among whom, it was rated least important by respondents earning HRK 10,000 and more per month. Table 4 shows in detail the results related to the respondents structure to the knowledge of these concepts and the importance of certain factors in making a purchase decision in relation to the amount of monthly income.

Table 4 Distribution of respondents by the amount of monthly income and their knowledge of sustainable development concepts, socially responsible businesses, and "green" consumers, and in relation to what is most important to them when choosing a product

	Number of respondents (%) by monthly income				*P**
	Up to HRK 4,999 monthly	***HRK 5,000 - HRK 7,999 monthly***	***HRK 8,000 - HRK 9,999 monthly***	***HRK 10,000 and more monthly***	
Are you familiar with the term 'sustainable development'?					
Yes	12 (60)	36 (72)	12 (86)	19 (79.2)	0.59
No	8 (40)	13 (26)	2 (14)	5 (20.8)	
Unanswered	0	1 (2)	0	0	
What does the term 'sustainable development' mean to you?					
Growth that keeps pace with environmental and social responsibility	15 (75)	38 (76)	10 (71)	17 (70.8)	0.95
A promotional term used for PR companies	2 (10)	4 (8)	1 (7)	0	0.49
A limiting factor for economic growth	0	6 (12)	1 (7)	2 (8.3)	0.50
Overall a positive process	1 (5)	6 (12)	1 (7)	3 (12,5)	0.88
I'm not sure what that term means	4 (20)	7 (14)	2 (14)	4 (16,7)	0.94
Are you familiar with the concept of 'corporate social responsibility'?					
Yes	15 (75)	41 (82)	12 (86)	23 (95.8)	0.42
No	5 (25)	8 (16)	2 (14)	1 (4.2)	
Unanswered	0	1 (2)	0	0	
What does the term 'corporate social responsibility' mean to you?					
Company responsibility for their impact on society	14 (70)	34 (68)	10 (71)	15 (62.5)	0.93
Ethics in business	11 (55)	26 (52)	11 (79)	14 (58.3)	0.38
Caring for employees, society and the environment	13 (65)	36 (72)	12 (86)	21 (87.5)	0.25
Respect for the interests of all stakeholders including consumers, suppliers and the local community	12 (60)	29 (58)	9 (64)	12 (50)	0.84
I'm not sure what that term means	1 (5)	3 (6)	1 (7)	0	0.62

	Number of respondents (%) by monthly income				*P**
	Up to HRK 4,999 monthly	***HRK 5,000 - HRK 7,999 monthly***	***HRK 8,000 - HRK 9,999 monthly***	***HRK 10,000 and more monthly***	
Are you familiar with the term 'green consumer'?					
Yes	13 (65)	35 (70)	8 (57)	20 (83.3)	0.49
No	6 (30)	14 (28)	6 (43)	4 (16.7)	
Unanswered	1 (5)	1 (2)	0	0	
What does the term 'green consumer' mean to you?					
Consumers who have different shopping habits	4 (20)	20 (40)	5 (36)	16 (66.7)	0.02
Consumers who have different product selection criteria when choosing a product	3 (15)	10 (20)	2 (14)	10 (41.7)	0.14
Consumers who prefer products that are environmentally friendly	10 (50)	26 (52)	7 (50)	14 (58.3)	0.94
Consumers who choose the products of companies guided by the principles of sustainable development	5 (25)	19 (38)	6 (43)	8 (33.3)	0.71
I'm not sure what that term means	4 (20)	7 (14)	4 (29)	3 (12.5)	0.53
What is most important to you when choosing a product ?					
Price	15 (75)	38 (76)	9 (64)	12 (50)	0.14
Quality	19 (95)	48 (96)	13 (93)	24 (100)	0.65
Brand	16 (80)	27 (54)	9 (64)	14 (58.3)	0.24
Socially responsible business of the company that produces the product	12 (60)	22 (44)	7 (50)	6 (25)	0.12
Environmental friendliness of the product	17 (85)	33 (66)	10 (71)	15 (62.5)	0.37

*Fisher exact test
Source: Authors

Respondents' opinions and attitudes towards environmentally friendly products with respect to the amount of monthly income are shown in Table 5. Respondents are willing to pay more for a more environmentally friendly product and this is somewhat more pronounced among those with lower income (80%). Respondents with income up to HRK 9,999 are generally willing to pay a 5% or 10% higher price. Respondents earning HRK 10,000 or more are willing to pay a 5% or 15% higher price for an environmentally friendly product. Respondents whose monthly income is higher than HRK 8,000 usually think about how much their shopping habits affect environmental protection. Those respondents whose income is less than HRK 8,000 on average think about a purchase sometimes and rarely. Similar attitudes regarding product recycling exist among respondents with different monthly income.

Whether or not a product manufacturer is an environmentally responsible company is sometimes considered when buying, regardless of monthly income. Advertising messages about environmentally friendly products rarely affect respondents with monthly income up to HRK 4,999 when buying, and most of those with income higher than the said amount are affected sometimes.

Table 5 Distribution of respondents by their opinions and attitudes towards environmentally friendly products and by the amount of their monthly income

	Number of respondents (%) by montly income					*P**
	Up to HRK 4,999 monthly	*HRK 5,000 - HRK 7,999 monthly*	*HRK 8,000 - HRK 9,999 monthly*	*HRK 10,000 and more monthly*	*Total*	
Would you pay more for a product that is environmentally friendly?						
Yes	16 (80)	38 (76)	9 (64)	17 (70.8)	80 (74.1)	0.47
No	3 (15)	12 (24)	5 (36)	6 (25)	26 (24.1)	
Unanswered	1 (5)	0	0	1 (4.2)	2 (1.9)	
How much more are you willing to pay for an organic product?						
5%	7 (35)	14 (28)	3 (21)	6 (25)	30 (27.8)	0.33
10%	8 (40)	15 (30)	5 (36)	2 (8.3)	30 (27.8)	
15%	1 (5)	5 (10)	1 (7)	7 (29.2)	14 (13)	
20%	1 (5)	3 (6)	0	2 (8.3)	6 (5.6)	
More than 20%	0	2 (4)	1 (7)	0	3 (2.8)	
Unanswered	3 (15)	11 (22)	4 (29)	7 (29.2)	25 (23.1)	
When buying a product, how often do you think that by choosing the product you personally influence environmental protection?						
Always	0	3 (6)	1 (7)	1 (4.2)	5 (4.6)	0.19
Often	2 (10)	9 (18)	1 (7)	6 (25)	18 (16.7)	
Sometimes	6 (30)	17 (34)	10 (71)	11 (45.8)	44 (40.7)	
Rarely	11 (55)	16 (32)	2 (14)	4 (16.7)	33 (30.6)	
Never	1 (5)	5 (10)	0	2 (8.3)	8 (7.4)	
Unanswered	0	3 (6)	1 (7)	1 (4.2)	5 (4.6)	
When buying a product, how often do you think that the selected product can be recycled?						
Always	0	2 (4)	1 (7)	1 (4.2)	4 (3.7)	0.68
Often	2 (10)	10 (20)	5 (36)	4 (16.7)	21 (19.4)	
Sometimes	9 (45)	19 (38)	7 (50)	10 (41.7)	45 (41.7)	
Rarely	8 (40)	15 (30)	1 (7)	6 (25)	30 (27.8)	
Never	1 (5)	3 (6)	0	3 (12.5)	7 (6.5)	
Unanswered	0	1 (2)	0	0	1 (0.9)	
When buying a product, how often do you think about whether the manufacturer is an environmentally responsible company?						
Always	0	1 (2)	1 (7)	0	2 (1.9)	0.88
Often	1 (5)	6 (12)	0	3 (12.5)	10 (9.3)	
Sometimes	9 (45)	20 (40)	7 (50)	10 (41.7)	46 (42.6)	
Rarely	7 (35)	18 (36)	6 (43)	8 (33.3)	39 (36.1)	
Never	3 (15)	5 (10)	0	3 (12.5)	11 (10.2)	

	Number of respondents (%) by montly income					*P**
	Up to HRK 4,999 monthly	*HRK 5,000 - HRK 7,999 monthly*	*HRK 8,000 - HRK 9,999 monthly*	*HRK 10,000 and more monthly*	*Total*	
How often are your purchasing decisions influenced by advertising messages about environmentally friendly products?						
Always	1 (5)	2 (4)	2 (14)	0	5 (4.6)	0.54
Often	3 (15)	8 (16)	2 (14)	3 (12.5)	16 (14.8)	
Sometimes	7 (35)	23 (46)	9 (64)	14 (58.3)	53 (49.1)	
Rarely	8 (40)	14 (28)	1 (7)	5 (20.8)	28 (25.9)	
Never	1 (5)	3 (6)	0	2 (8.3)	6 (5.6)	
Total	**20 (100)**	**50 (100)**	**14 (100)**	**24 (100)**	**108 (100)**	

*Fisher exact test
Source: Authors

6. Conclusion

Consumers are extremely important stakeholders of every business entity because their purchasing habits and decisions directly affect business revenues and ultimately the business result. Their shopping habits also have an impact on the environment and natural resources and are important for the concept of sustainable development.

Previous research found differences in consumer behavior and their general attitudes towards sustainable development. Consumer behavior varies greatly across cultures, countries, and situations. A study conducted by Ham (2009) states that in the Republic of Croatia, people aged 15 to 24 are least interested in environmentally friendly products. A recent study by Ham et al. (2015) shows that students perceive the importance of corporate social responsibility.

As the student population belongs to this segment, the aim of this research was to determine whether there have been changes in attitudes compared to the past.

The research results indicate that the student population is familiar with the concepts of sustainable development, socially responsible business and green consumers, and defines them correctly regardless of their gender and the amount of monthly income. For environmentally friendly products, they are willing to pay a 5% or 10% higher price, and those earning HRK 10,000 or more per month, even 15%. When buying a product, respondents sometimes and rarely consider recycling and environmentally responsible behavior of the product manufacturer. Advertising messages about environmentally friendly products rarely affect their shopping habits.

From all the above, it is evident that compared to 2009, the student population has changed their attitudes towards environmentally friendly products, but the trend has not changed since 2015. It is a market segment that thinks about this factor when choosing a product. Therefore, consumers' attitudes towards environmentally friendly products and their purchasing habits should be continuously researched in order to gain a deeper understanding of these processes. Future research could include comparative studies as well investigate attitudes of specific groups including a wider age range and geografic area, which were the main limitations of our research. Namely, this research was conducted at only one college; hence, it may be said that this is the main limitation, together with respondents coming from a rather small geografic area. It would be also useful to investigate consumer behaviour related to environmentally friendly products in different situations such as at home and on vacation.

A multidisciplinary approach to green consumer research would be recommended to capture the full potential of the impact that green consumers can have on the future influence on company performance. A deeper understanding of green consumer behaviour would certainly help numerous companies in the process of creating their business strategies.

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A COMPARATIVE ANALYSIS OF THE EFFICIENCY OF LIFE AND NON-LIFE SECTORS IN SELECTED CEE COUNTRIES

Abstract

Purpose: The aim of this paper is to analyze overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE) of both life and non-life insurance sectors in three Central and Eastern European countries (CEE), i.e. Croatia, Hungary and Poland, in 2018.

Methodology: The efficiency of insurance sectors is estimated by applying data envelopment analysis (DEA), while a one-way analysis of variance (ANOVA) is performed to find out whether there exists any statistically significant difference between the estimated levels of the efficiency of non-life and life insurance sectors in the observed CEE countries.

Results: Out of 34 non-life Polish insurers, only two (6%) were overall technically efficient, while the remaining 32 were inefficient. Croatia and Hungary achieved better results with three (20%) and seven (43.7%) efficient insurers, respectively. However, when observing the life insurance segment, half of the Croatian life insurers were efficient according to the CCR model, while six (23%) Polish and three (23%) Hungarian efficient insurers were recorded.

Conclusion: Research reveals that the Hungarian non-life insurers are the most efficient ones in terms of OTE, PTE and SE. They are followed by the Croatian insurers, leaving the Polish insurers behind. Regarding the life insurance sector, the domination of the Croatian insurers is recorded, while the Hungarian ones were found to be the least efficient. Moreover, inefficiency in both life and non-life sectors (except for the Hungarian life sector) is more related to scale than to managerial inefficiency. Finally, ANOVAs and Tukey post hoc tests revealed a statistically significant difference among considered groups of insurers.

Keywords: Efficiency, insurance sector, DEA, Central and Eastern European countries

1. Introduction

After joining the European Union (EU) in 2004 and 2013, the insurance markets in Poland, Hungary and Croatia encountered a dynamic business environment, which is primarily reflected in a more competitive single European market. The idea of a "single European passport" enabled insurers to conduct insurance activities throughout the EU as long as they obtained a license from a regulatory body in one EU country. As suggested by Fenn et al. (2008), the assumption underlying the creation of a single market is that a greater level of competition across national frontiers will decrease costs through reduced X-inefficiency, while mergers and acquisitions will additionally cut costs as a result of scale economies.

Despite these changes, sometimes challenged by insurance companies in these relatively new EU members, there has been no comparative research regarding the obtained efficiency levels in these countries. Specifically, most cross-country efficiency studies relating to the insurance sector focus on a group of developed European countries (e.g. Diacon et al., 2002; Fenn et al., 2008) or the USA (e.g. Cummins & Xie, 2008; Weiss & Choi, 2008). However, papers dealing with Central and Eastern European countries with developing insurance markets are rather scarce. In order to fill this gap, the authors performed efficiency analysis of three selected countries (Croatia, Poland and Hungary) as they share certain mutual characteristics. Precisely, Croatia, Poland and Hungary are Central and Eastern European countries (CEECs) that are relatively new EU member states. These countries have undergone a similar and rather dynamic path from being centrally managed economies with poorly developed insurance markets dominated by single state-owned insurance companies, to the transition to a market economy as well as undergoing challenging regulatory framework changes with the aim of joining the EU. Moreover, the level of the development of their insurance markets, measured by insurance density (i.e. €324, €366 and €326) and penetration (i.e. 2.6%, 2.8% and 2.4%) in 2018 for Croatia, Poland and Hungary, respectively (Insurance Europe, 2020), shows considerable similarity, confirming the fact that these countries form an adequate sample for analysis.

Keeping the above in mind, the aim of this paper is to analyze (and compare) how efficient Croatian, Hungarian and Polish life and non-life insurance sectors were in 2018. Regarding Croatian and Hungarian insurance markets, the analysis is done on the sample of life, non-life as well as composite insurance companies whose operations are separated into life and non-life insurance sectors, while the Polish insurance market exclusively comprises companies conducting life or non-life insurance activities. This paper contributes to the existing literature due to the fact that research on cross-country overall technical efficiency, pure technical efficiency and scale efficiency in the insurance sectors of developing economies is quite scarce. Furthermore, DEA enables identification of efficient insurers within each country and benchmarking against the best of them. In addition, a comparison of the levels of efficiency in all three developing insurance markets is provided, thus enabling this paper to further add to scientific thought.

The paper is organized as follows. After the introductory section explaining the rationale for conducting such an analysis, the next section provides an overview of the existing literature. The methodology used, as well as inputs and outputs employed in the analysis, are described in the third section. The fourth section presents the obtained results, while the final section offers a conclusion.

2. Overview of the existing literature

The initial studies in the field of the efficiency of insurance companies were performed at the country level, and researchers later expanded their analysis by comparing the efficiency of insurance companies in different countries. A cross-country comparison started with Weiss's study (1991), while the studies that followed expanded the sample of countries by including insurers operating in OECD countries (Donni & Fecher, 1997). In general, the findings of these studies showed significant differences in insurers' efficiency in the analyzed countries. Following deregulation of insurance markets in the EU in 1994 and industry consolidation, research focused on a comparative analysis of insurance companies operating in the EU member states. Diacon et al. (2002) studied the efficiency of 450 insurers from 15 European countries and found that insurers operating in the United Kingdom, Spain, Sweden and Denmark achieved the highest average technical efficiency score. On the other hand, insurance companies in the United Kingdom had low levels

of scale and allocative efficiency. Fenn et al. (2008) researched the efficiency of life, non-life and composite insurers in 14 European countries covering the period from 1995 to 2001. Most insurance companies operated at increasing returns to scale. Larger insurance companies and those with a high market share were characterized by a lower level of cost efficiency. Eling and Luhnen (2010) analyzed the efficiency of 6,462 life and non-life insurance companies operating in 36 countries during the period 2002-2006. The authors analyzed the efficiency of insurance companies from different aspects (organizational form, company size, number of lines of business, different methodologies) and discovered significant differences in efficiency scores among insurance companies operating in developed and emerging countries, implying the potential for efficiency improvement in the latter. In comparison to former studies that were mainly focused on developed countries, with some exceptions encompassing both developed and undeveloped insurance markets, Biener and Eling (2011) studied the efficiency of 20 microinsurance programs in emerging countries (Africa, Asia, and Latin America) in the period from 2004 to 2008. They found substantial diversity among the programs, indicating improvement potential. Additionally, Huang and Eling (2013) analyzed the efficiency of non-life insurers in BRIC countries in the period from 2000 to 2008. They found an important effect of country-specific environmental factors on the insurers' efficiency. The most efficient non-life insurance sector was the Brazilian one, while Indian non-life insurers operated at the lowest level of efficiency. Škrinjarić (2017) analyzed the efficiency of insurance industries in 29 European countries in the period from 2004 to 2013. The study showed that there were significant differences between the five most efficient and the five most inefficient insurance industries. Slovenia, Slovakia and Poland were among the insurance industries from CEEC that had an efficiency index equal to 1 in some years in the analyzed period. On the other hand, the Croatian insurance industry was among the five most inefficient insurance sectors in Europe. Analyzing the relationship between competition and soundness in 10 European life insurance industries, Cummins et al. (2017) found that efficiency is a channel for the influence of competition on soundness. While some of the less developed European insurance markets have been included in the sample of the studies that combine both less developed and developed markets, studies of the efficiency of insurance companies in the less developed markets have mostly been performed for a specific country. These works refer to the efficiency of insurance companies in Poland (Kozak, 2010; Kozak, 2018), Croatia (Jurčević & Mihelja Žaja, 2013), North Macedonia (Mijackova, 2015), Serbia (Mandić et al., 2017; Lukić et al., 2018) and Slovakia (Grmanová & Strunz, 2017). To the best of the authors' knowledge, there are only two studies that compare the efficiency of insurers operating in CEE countries. Medved and Kavčič (2012) compared the efficiency of 24 life and non-life insurers in Croatia and 15 insurance companies in Slovenia in the period 2006-2010. The results confirmed that the Slovenian insurance industry had a higher cost and technical efficiency in comparison to the Croatian insurance industry. The second study compared the efficiency of 17 insurance companies from the Czech Republic and 26 insurers from Poland for life insurance in the period 2013-2015 (Grmanová & Pukala, 2018). The share of efficient insurers in both countries was almost equal. The average efficiency of Polish companies was higher, while the variability in their efficiency was lower in comparison to the Czech insurers. Taking into consideration that fact that little research has been conducted at the cross-country level among Central and Eastern European countries, as well as the lack of any study of the efficiency of Hungarian insurance companies (they were only part of the sample of one cross-country analysis (Škrinjarić, 2017)), this research focuses on a comparative analysis of life and non-life insurers operating in Croatia, Hungary and Poland.

3. Methodology and description of inputs and outputs

Due to the nature of research, the authors applied Data Envelopment Analysis (DEA) as it utilizes a linear programming model that is based on multiple inputs and outputs and creates a single efficiency score for each decision making unit (DMU), which is in this analysis represented by an insurer. After the seminal work of Charnes et al. (1978), in which the BBC model (based on constant returns to scale) was presented, Banker et al. (1984) developed a more flexible model allowing for variable returns to scale. Since the aim of this research is to explore overall technical efficiency (OTE), pure technical efficiency (PTE) and scale efficiency (SE) of insurers operating in selected CEE countries, both of these models were used. As most insurer efficiency analy-

ses are input-oriented (Cummins & Weiss, 2013), we opted for input orientation. The description and reasoning for the selection of inputs and outputs used in this research is provided in what follows.

Since the sample encompasses insurance companies, it is necessary to identify services performed by insurers. In doing so, the generally accepted value-added approach is employed, categorizing insurance services into risk-pooling/bearing services, intermediation and financial services (e.g. Biener & Eling, 2011; Cummins & Weiss, 2013). Due to being risk-averse, policyholders are ready to pay an insurance premium in exchange for potential loss and, according to Cummins and Weiss (2013), a premium paid in addition to the expected loss is the value added by risk-pooling/-bearing. Therefore, as a proxy for risk-pooling/-bearing services we use *net earned premiums* as the first output in efficiency analysis, following Huang and Eling (2013). In order to proxy for an intermediation function performed by insurers, *total investments* are used as a second output. As stated by Cummins and Weiss (2013), insurers issue insurance policies and invest the funds collected in the form of premiums into different types of assets until the risk insured occurs or until they become due. This is also done by e.g. Biener and Eling (2011), and Huang et al. (2016). In addition to risk-pooling/-bearing services and the intermediation function performed by insurers, the financial service function is not encompassed by the analysis with a separate output due to the fact that premium income and total investments are too largely associated with the financial service function. Regarding the choice of inputs, we employ labor, business services and debt capital. Following the approach of Eling and Luhnen (2010), Biener and Eling (2012) and Biener et al. (2016), we observed labor and business services as a single input represented by *operating expenses*. This is often done to reduce the number of parameters or due to data unavailability. The rationale for such an approach can be found in the fact that operating expenses, i.e. the costs of insurance activity, consist of acquisition costs and administrative expenses, with commissions having a major share in acquisition costs. Specifically, acquisition costs comprise commissions, other acquisition costs and changes in deferred acquisition costs, while administrative expenses comprise depreciation of fixed assets, employee salaries and other administrative expenses. In this way, insurers' internal employees, i.e. home office labor and outsourced salesforce, are taken into account. *Total technical provisions* are also used as an input of an insurer and this is in accordance with Fenn et al. (2008). The total technical provisions comprise provisions for unearned premiums, provisions for bonuses and rebates, provisions for claims outstanding, mathematical provisions, special provisions, equalization provisions and other accounting technical provisions. Furthermore, we included special provisions formed by insurers pursuing life insurance business when the investment risk is borne by the policyholders. In Berger et al. (1997), this input is denoted as debt capital since it mainly contains funds borrowed from policyholders or, as stated by Huang and Eling (2013), insurance companies collect debt capital by issuing insurance policies to the insured and then "intermediate" these funds into invested assets.

Data on inputs and outputs used in this study are taken from various sources. Precisely, inputs and outputs relating to the Croatian insurance sector were retrieved from insurers' annual reports available on their web pages or from the Annual Financial Statements Registry administered by the Croatian Financial Agency (FINA) (2020). Furthermore, data on selected inputs and outputs referring to the Polish insurance market are obtained from annual reports entitled Statistics, available through the Polish Chamber of Insurance (PIU) (2020). Finally, data on operating expenses, technical provisions, earned premiums and investments registered by Hungarian insurers are retrieved from the Golden Book of Magyar Nemzeti Bank (MNB) – the Hungarian Central Bank (2020) comprising key financial data on insurers.

4. Empirical results and discussion

Descriptive statistics of inputs and outputs that most adequately describe the true nature of (non) life insurance business are presented in Table 1. As expected, the average amount of net earned premiums achieved in the non-life sector is higher than the one obtained in the life sector. However, this difference is not too large (approximately 7%), suggesting that the latter should soon catch up with the more developed non-life sector.

Table 1 Descriptive statistics of inputs and outputs for non-life and life insurers

Non-life					
	N	Minimum	Maximum	Mean	Std. Deviation
OPER.EXP.	65	210,101	702,362,040	44,449,625	102,824,865
TECH.PROV.	65	908,874	5,265,540,310	276,709,687	741,345,936
N.P.	65	131,337	2,837,023,266	143,683,498	400,213,378
INV.	65	4,314,769	8,773,845,523	329,797,587	1,128,977,606
Life					
	N	Minimum	Maximum	Mean	Std. Deviation
OPER.EXP.	51	298,029	270,794,903	30,471,419	43,214,895
TECH.PROV.	51	1,529,088	5,241,416,815	526,625,066	863,592,218
N.P.	51	100,587	1,941,534,479	134,077,723	277,245,590
INV.	51	5,727,897	6,302,423,169	516,077,748	1,015,638,807

Note: Values of all inputs and outputs are presented in euros (exchange rates used to convert a national currency into euros were taken from EUROSTAT (2020) for 2018 as the analysis was performed for this year).
Source: Authors' calculation

The correlation analysis results are presented in Table 2. All inputs and outputs show a strong correlation as their values range from 0.897 to 0.991. Moreover, all correlation coefficients are statistically significant at the level of 0.01. What is most important is that all of the correlation coefficients between the inputs and the outputs are positive, indicating that they change in the same direction, i.e. when inputs increase, the outputs increase as well, which means that the data satisfy isotonicity (Wang et al., 2015). Hence we can proceed with the application of the DEA technique. All efficiency scores were calculated by means of Performance Improvement Management Software (PIM-DEA).

Table 2 Correlation analysis for the non-life and life insurance companies

	Non-life				**Life**			
	OPER. EXP.	TECH. PROV.	N.P.	INV.	OPER.EXP.	TECH. PROV.	N.P.	INV.
OPER. EXP.	1				1			
TECH. PROV.	.980**	1			.897**			
N.P.	.991**	.990**	1		.912**	.935**	1	
INV.	.951**	.974**	.972**	1	.902**	.982**	.938**	1

** Correlation is significant at the 0.01 level (2-tailed).
Source: Authors' calculation

4.1 Efficiency analysis of the non-life insurance sector

The efficiency scores for the non-life insurance sector are presented in Table 3. According to the realized level of the overall efficiency score (OTE), as obtained by the CCR model, the lowest efficiency score was recorded in Poland (46.9%), suggesting that, on average, insurers operating in the non-life sector can reduce their inputs by 53.1% in order to become efficient and achieve the efficiency frontier. It is also interesting to note that this country has the smallest number of efficient insurers. Specifically, out of 34 non-life insurers, only two (6%) were overall technically efficient (i.e. with the recorded efficiency of 100%), while all other remaining insurers were inefficient. The situation is better for Croatia and Hungary, where three (20%) and seven (43.7%) insurers were efficient. In these countries, the average overall efficiency scores amounted to 64.8% and 82.8%, respectively.

Table 3 Efficiency scores for non-life insurers

BCC	Croatia			Hungary				Poland				Poland (continued)			
DMU	CCR	BCC	SE	DMU	CCR	BCC	SE	DMU	CCR	BCC	SE	DMU	CCR	BCC	SE
DMU1	76.58	100	76.58	DMU1	100	100	100	DMU27	25.14	100	25.14	DMU44	64.02	68.83	93.01
DMU2	100	100	100	DMU2	66.85	100	66.85	DMU28	26.04	84.93	22.11	DMU45	19.17	19.58	97.92
DMU3	57.59	100	57.59	DMU3	100	100	100	DMU29	27.14	98.64	26.77	DMU46	91.65	100	91.65
DMU4	84.14	100	84.14	DMU5	100	100	100	DMU30	35.22	98.05	34.54	DMU47	32.6	44.94	72.54
DMU5	48.39	75.14	64.4	DMU7	100	100	100	DMU31	32.89	75.36	24.79	DMU48	26.34	51.3	51.36
DMU7	74.63	100	74.63	DMU8	69.17	100	69.17	DMU32	68.95	60.73	41.87	DMU49	58.79	74.11	79.32
DMU8	49.32	83.51	59.05	DMU9	96.08	99.9	96.18	DMU33	100	100	100	DMU50	36.92	73.77	50.05
DMU9	100	100	100	DMU11	85.37	95.1	89.76	DMU34	72.36	41.23	29.83	DMU51	49.59	100	49.59
DMU10	63.85	94.81	67.35	DMU12	77.11	94.89	81.25	DMU35	30.44	94.48	28.76	DMU52	100	100	100
DMU21	100	100	100	DMU13	69.72	73.33	95.08	DMU36	84.59	35.54	30.06	DMU53	25.66	71	36.15
DMU12	40.73	45.05	90.4	DMU14	61.41	89.74	68.44	DMU37	34.11	79.63	27.16	DMU54	27.25	78.31	34.8
DMU13	55.23	80.92	68.26	DMU16	100	100	100	DMU38	47.09	96.59	45.48	DMU55	65.07	65.97	98.64
DMU15	50.16	91.05	55.08	DMU18	72.82	74.11	98.27	DMU39	36.13	59.31	21.43	DMU56	52.05	100	52.05
DMU16	50.6	57.76	87.6	DMU19	100	100	100	DMU40	55.92	39.08	21.86	DMU57	20.53	29.99	68.44
DMU17	69.86	79.06	88.36	DMU20	93.32	96.49	96.71	DMU41	40	79.06	31.63	DMU58	27.34	70.42	38.83
				DMU21	100	100	100	DMU42	59.68	97.2	58.01	DMU59	33.58	100	33.58
								DMU43	55.18	100	55.18	DMU60	45.04	45.18	99.68
Average	64.76	82.64	74.28	-	82.81	90.56	86.92	*(continued in columns on the right)*				-	46.87	73.35	51.61
No. of eff. ins.	3 (20%)	7 (46.7%)	3 (20%)	-	7 (44%)	9 (56%)	7 (44%)					-	2 (6%)	8 (24%)	2 (6%)

Source: Authors' calculations

From the aspect of pure technical efficiency (PTE) obtained by the BCC model, it can be stated that the level of efficiency obtained for each country is higher (when compared to the OTE scores), as a larger number of non-life insurers form an efficiency frontier. Efficient insurers represent a "reference set" or benchmarks that are recognized by inefficient insurers as those with good operating practices which they need to reach. For example, reference sets for the inefficient Hungarian non-life insurer marked as DMU2 are DMU7, DMU19 and DMU21, meaning that for DMU2 to be efficient, it should use a combination of DMU7, DMU19 and DMU21 (due to space limitations, a supporting table is not presented here). A corresponding reference set is created for each inefficient insurer. In this way, every inefficient insurer can evaluate various aspects and segments of its own process of the transformation of inputs into outputs and relate it to the best operating practice in order to develop adequate plans regarding kinds of improvements that are needed and how these improvements can be made in order to become efficient (since this kind of analysis is beyond the scope of this research, we will now turn back to the elaboration and interpretation of pure technical efficiency). Given the scale size, pure technical efficiency scores for Poland, Croatia and Hungary are 73.35%, 82.64% and 90.56%, respectively. These values point to a segment of OTE which can be attributed to the efficient transformation of inputs into outputs. Also, according to the results, the number of pure technically efficient non-life insurance companies is eight (23.5%) for Poland, seven (46.7%) for Croatia and nine (56.3%) for Hungary. Again, according to the average value of pure technical efficiency and the number of efficient insurers, Hungarian insurance companies seem to be the most efficient ones, followed by Croatian and then Polish insurers. Finally, aiming to analyze whether the inefficiency of non-life insurers was due to their size or their inefficient production operation, scale efficiency (SE) was calculated by dividing the efficiency scores accomplished by the application of the CCR model by those gained by the BCC model, as proposed by Cooper et al. (2007) and later implemented by Cummins and Xie (2012), Micajkova (2015) and many others. The average values of scale efficiency for the analyzed insurers operating in CEE countries were 51.61%, 74.28% and 86.62% for Poland, Croatia and Hungary, respectively, suggesting that 48.39%, 25.72% and 13.38% inefficiency occurred because of the deviation of the current scale of production from the most productive scale size, as indicated by Ismail et al. (2011). The analysis also revealed that the overall technical inefficiency of the non-life insurers marked as DMU1, DMU3, DMU4 and DMU7 for Croatia; DMU2 and DMU8 for Hungary; and DMU27, DMU43, DMU46, DMU51, DMU56 and DMU59 for Poland, was entirely due to scale inefficiency. Likewise, the number of scale efficient insurers, i.e. insurers that recorded a scale efficiency score of 100% (meaning they were operating at the optimal size while using their particular input-output combination), is 2 (6%), 3 (20%) and 7 (44%) for Poland, Croatia and Hungary, respectively. As for the remaining non-life insurers, SE scores were less than 100%; thus they were scale inefficient. To sum up, according to the efficiency scores presented here, Hungarian non-life insurers are the most efficient ones, while insurers operating in Poland are the most inefficient ones. The efficiency of Croatian non-life insurers lies between the two. A more detailed analysis showed that although, on average, similar levels of inputs were used by the Croatian and Hungarian insurers, the latter succeeded to generate twice the amount of net earned premiums. On the other hand, technical provisions recorded in Poland were five times larger than those in the other two countries.

Table 4 Efficiency scores for life insurers

BCC	Croatia			Hungary				Poland				Poland (continued)			
DMU	CCR	BCC	SE	DMU	CCR	BCC	SE	DMU	CCR	BCC	SE	DMU	CCR	BCC	SE
DMU2	100	100	100	DMU1	63.51	78.97	80.42	DMU1	77.57	83.89	92.46	DMU14	85.87	90.71	94.67
DMU3	100	100	100	DMU2	81.09	90.7	89.41	DMU2	83.44	97.56	85.53	DMU15	100	100	100
DMU4	96.46	100	96.46	DMU4	100	100	100	DMU3	96.88	100	96.88	DMU16	58.89	86.48	68.1
DMU6	100	100	100	DMU6	26.37	100	26.37	DMU4	70.72	89.54	78.98	DMU17	100	100	100
DMU8	100	100	100	DMU8	61.77	67.76	91.17	DMU5	51.28	100	51.28	DMU18	100	100	100
DMU9	94.89	100	94.89	DMU10	100	100	100	DMU6	100	100	100	DMU19	100	100	100
DMU13	100	100	100	DMU11	56.65	60.14	94.19	DMU7	72.43	100	72.43	DMU20	57.47	79.25	72.52
DMU14	100	100	100	DMU12	33.86	48.66	69.58	DMU8	64.46	84.75	76.06	DMU21	71.72	82.43	87.01
DMU15	87.67	100	87.67	DMU15	100	100	100	DMU9	75.1	100	75.1	DMU22	75.87	77.8	97.52
DMU16	89.87	91.76	97.93	DMU17	50.72	100	50.72	DMU10	90.08	93.24	96.61	DMU23	64.53	84.22	76.63
DMU17	88.97	100	88.97	DMU18	62.93	72.73	86.52	DMU11	100	100	100	DMU24	74.86	100	74.86
DMU18	90.51	91.6	98.81	DMU19	59.77	64.85	92.16	DMU12	59.39	76.51	77.62	DMU25	89.3	96.04	92.98
				DMU20	50.59	55.77	90.72	DMU13	79.42	91.74	86.57	DMU26	93.94	100	93.94
Average	89.26	91.95	90.52		61.45	75.18	77.45	*(continued in columns on the right)*					78.49	90.38	84.21
No. of eff. ins.	6 (50%)	10 (83%)	6 (50%)	-	3 (23%)	5 (38%)	3 (23%)					-	6 (23%)	12 (46%)	6 (23%)

Source: Authors' calculations

4.2 Efficiency analysis of the life insurance sector

The results of the efficiency analysis performed on life insurers can be found in Table 4. It is noticeable that all efficiency scores, i.e. OTE, PTE and SE for Croatia and Poland, are much higher in the life insurance sector than in the non-life sector. The opposite is true for Hungary, for which the life-sector recorded smaller efficiency values than the non-life sector. A more detailed analysis of each country indicates that according to the number of efficient life insurance companies, Croatia is the leading country, as half of the life insurers are efficient according to the CCR model, and more than 80% of the insurers are efficient according to the BCC model. Croatia is followed by Poland with 23% and 46% of efficient insurers and then Hungary with 23% and 38% of efficient insurers, depending on whether the CCR or BCC is applied. The same order of the countries is repeated once again when the average values of overall technical efficiency, pure technical efficiency and scale efficiency are observed. Specifically, according to the average values of OTE, PTE and SE, life insurers operating in Croatia are most efficient (with efficiency scores of 89%, 92% and 91%), followed by Poland (with efficiency scores of 79%, 90% and 84%), while leaving Hungary behind (with efficiency scores of 62%, 75% and 77%).

It is worth mentioning that the scale efficiency scores are lower than the pure technical efficiency scores in all countries in both life and non-life sectors (the only exception is the Hungarian life sector), implying that the main source of insurers inefficiency is more related to scale inefficiency than to the managerial inefficiency. This further indicates that an increase in pure technical efficiency can be realized through an increase in the scale of operation in the insurance industry (the size of insurers), as noted by Karbhari et al. (2018). Thus, in order to increase scale operation, insurers might become involved in M&A activities. As regards the individual studies conducted earlier on the insurance industry in the analyzed three CEE countries, it can be stated that the none of the obtained efficiency scores from either of the two previous studies carried out in Croatia (Medved & Kavčič, 2012; Jurčević & Mihelja Žaja, 2013) can be directly compared with the efficiency scores obtained in the present research, as neither of earlier studies separately analyzed the non-life and the life insurance sector. Moreover, in both studies, the last year that was analyzed was 2010, while in this research analysis is performed for 2018. Still, we will mention that OTE and SE achieved by Medved and Kavčič (2012) ranged from 0.6 to 0.89 (for OTE) and from 0.64 to 0.93 (for SE), while the OTE and PTE scores recorded by Jurčević and Mihelja Žaja (2013) ranged from 0.74 to 0.95 (for OTE) and from 0.91 to 0.98 (for PTE), depending on the particular year that was included in the analysis. Furthermore, no studies covering OTE, PTE or SE were found for the Hungarian insurance industry, while only one piece of research has been detected for Poland (i.e. Grmanová & Pukala, 2018), although the authors analyzed only the life sector in 2014 and used only PTE, which they found out to be 0.62.

4.3 One-way analysis of variance (ANOVA)

In order to test whether there are any statistically significant differences between the obtained levels of efficiency of both non-life and life insurers operating in the analyzed CEE countries, a one-way analysis of variance (ANOVA) is performed. However, when performing ANOVA one must have in mind that while examining three groups of independent insurers, i.e. insurers operating in three different countries, ANOVA can only provide information on whether at least two groups of analyzed insurers are statistically different. Thus, in order to find out which specific group of insurers was significantly different from the others, a Tukey post hoc test is performed. Conducting ANOVA for non-life and life sectors separately, using another efficiency score each time (i.e. OTE, PTE and SE) for the group of three countries (Croatia - CRO, Hungary - HU and Poland - PL) resulted in six ANOVA outputs. Abridged results are summarized in Table 5.

Table 5 ANOVA results

Type of efficiency scores	Non-life				Life			
	ANOVA		Post Hoc Test		ANOVA		Post Hoc Test	
	F	Sig.	Country	Sig.	F	Sig.	Country	Sig.
OTE	30,205	0.000	CRO and HU*	0.030	10,517	0.000	CRO and HU*	0.000
			CRO and PL*	0.000			CRO and PL*	0.031
			HU and PL*	0.000			HU and PL*	0.025
PTE	6,3226	0.003	CRO and HU	0.560	8,963	0.000	CRO and HU*	0.001
			CRO and PL	0.112			CRO and PL	0.330
			HU and PL*	0.003			HU and PL*	0.005
SE	14,783	0.000	CRO and HU	0.198	3,453	0.040	CRO and HU*	0.039
			CRO and PL*	0.008			CRO and PL	0.102
			HU and PL*	0.000			HU and PL	0.692

*The mean difference is significant at the 0.05 level.
Source: Authors' calculation

In brief, the results of all conducted ANOVAs indicated that regardless of the type of efficiency score used and the insurance sector observed (either non-life or life), there was a statistically significant difference between at least two groups of analyzed insurers. On the other hand, a Tukey post hoc test revealed a statistically significant difference among all three groups of insurers when considering overall technical efficiency (OTE). From the aspects of pure technical efficiency (PTE) and scale efficiency (SE), a difference generally occurred between Hungary and Poland in the non-life sector and Croatia and Hungary in the life sector.

5. Concluding remarks

The main goal of this research was to analyze overall technical efficiency, pure technical efficiency and scale efficiency of insurers operating in non-life and life insurance sectors in three CEE countries, i.e. Croatia, Hungary and Poland, in 2018. The analysis was performed with the input-oriented DEA model in which operating expenses and total technical provisions were used as inputs, while net earned premiums and total investments were used as outputs. The results of the conducted analysis revealed that, according to all efficiency scores (OTE, PTE and SE), Hungarian non-life insurers were the most efficient ones, followed by Croatian and then by Polish insurers, which were found to be the most inefficient ones. The situation is quite different when the life insurance sector is observed. Overall technical efficiency, pure technical efficiency and scale efficiency for Croatia and Poland recorded much higher values in this sector than in the non-life sector. The exception is Hungary, for which the life sector showed efficiency values smaller than for the non-life sector. Furthermore, the efficiency scores of Hungarian life insurers were smaller than those of Croatian insurers, which were found to be the most efficient ones, and which were followed by the Polish insurance companies. In other words, the Hungarian life insurers were found to be the most inefficient ones. The order of the analyzed CEE countries remained unchanged even when it was observed from the aspect of the number of efficient life insurers. It was also revealed that in all countries and in both life and non-life sectors (except for the Hungarian life sector), the main source of insurer inefficiency appeared to be scale inefficiency rather than managerial inefficiency, suggesting the necessity of increasing the insurers' size in order to increase their efficiency. Finally, when overall technical efficiency (OTE) is observed, a Tukey post hoc test indicated a statistically significant difference among all three groups of insurers regardless of whether they were operating in the non-life or the life insurance sector. On the other hand, when pure technical efficiency (PTE) and scale efficiency (SE) are taken into account, a significant difference generally appeared between Hungary and Poland in the non-life sector and Croatia and Hungary in the life sector.

Depending on data availability, the sample of the analyzed countries could be expanded in future research. In addition, a cross-country analysis of non-life and life insurers' productivity with the application of the Malmquist index could be performed.

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THE MEDIATING ROLE OF WORK ENGAGEMENT IN THE RELATIONSHIP BETWEEN PERCEIVED ORGANIZATIONAL SUPPORT AND TURNOVER INTENTION – WITH AN APPLICATION TO HEALTHCARE EMPLOYEES IN ERZINCAN PROVINCE OF TURKEY*

Abstract

Purpose: The main purpose of this study is to investigate the mediating role of work engagement (WE) in the relationship between perceived organizational support (POS) and turnover intention (TI).

Methodology: In this context, to test the model and hypotheses, research data were collected using a survey method from 427 public employees working in the healthcare sector in Erzincan province of Turkey. The data were analyzed using SPSS and AMOS programs.

Results: As a result of the analyses, it was found that perceived organizational support has a positive effect on work engagement and a negative effect on turnover intention, and work engagement and turnover intention variables are negatively correlated. It was also concluded that there was a partial mediating role of work engagement in the relationship between perceived organizational support and turnover intention.

Conclusion: In this study, it was determined that WE has a partial intermediary role in the relationship between POS and TI. According to these findings, the support provided to the employee by the organization reduces employee intention to quit. In this context, when organizational management implements practices that will ensure employee commitment in addition to supporting employees and creating this perception, it can further reduce the intention of employees to quit.

Keywords: Perceived organizational support, work engagement, turnover intention, healthcare sector

* This study is derived from the PhD study titled ''THE MEDIATING ROLE OF WORK ENGAGEMENT IN THE RELATIONSHIP BETWEEN PERCEIVED ORGANIZATIONAL SUPPORT AND TURNOVER INTENTION – WITH AN APPLICATION ON HEALTHCARE EMPLOYEES IN ERZINCAN PROVINCE OF TURKEY'' under the supervision of Prof. Dr. Orhan ÇINAR, Erzincan Binali Yıldırım University, Institute of Social Sciences.

1. Introduction

Since the focus of the health sector is human life, health sector employees work in a physically, emotionally, and cognitively more difficult and stressful environment compared to other service sector employees. In this challenging environment, communication and synergy that organizations will establish with employees are important. Also, the ability of healthcare professionals to focus on the goals of the organization and to use their talents depends on their integration with the work, their sense of belonging to the organization, and their ability to personally undertake organizational success or failure. In this case, employees' perception of organizational support comes into prominence. Perceived organizational support (POS) refers to "employees' perception that the organization values their contribution and cares about their well-being" (Eisenberger et al., 2002). Studies demonstrated that employees who perceive high organizational support show higher job satisfaction (Aube et al., 2007; Krishnan & Marry, 2012), work engagement (WE) (e.g. Saks, 2006; Rich et al., 2010; Murthy, 2017), organizational commitment (e.g. Loi et al., 2006; Arshadi, 2011) and organizational citizenship behavior (e.g., Noruzy et al., 2011; Singh & Singh, 2013), while experiencing lower turnover intention (TI) (e.g. Rhoades & Eisenberger, 2002; Perryer et al., 2010).

Many occupations in the health sector involve harsh conditions such as long working hours, shift work, and busy work pace. For this reason, in addition to healthcare professionals' POS, their WE levels are extremely important in terms of patient satisfaction, and ultimately organizational performance, because engaged employees perform better as they are strongly connected to and focused on their work (Schaufeli et al., 2002, p. 74) and thus contribute to achieving better financial results for the organization (Bakker & Albrecht, 2018, p. 5). WE is also a significant attitude that provides many benefits to the organization such as higher creativity, job performance, job satisfaction, organizational citizenship behavior, customer satisfaction, and lower turnover intention (Saks, 2006; Xanthopoulou et al., 2009; Bakker & Albrecht, 2018). Therefore, organizations working with engaged employees achieve their goals more easily. As a result, WE is essential for both organizational success and employees to enjoy their work.

Based on all this information, this study tried to find the answer to the following question: "Does WE have a mediating role in the relationship between POS and TI?" Within this framework, in this research, the terms POS, WE and TI and the relationship between these concepts were examined in light of the literature review and hypotheses were formed. After that, the data obtained from the health sector employees through the survey method were analyzed using statistical methods and the analysis results were evaluated and discussed. Finally, suggestions were made to those concerned, sector managers, and researchers who would like to make similar research studies in the future.

2. Conceptual framework

2.1 Perceived organizational support

Organizational support theory was developed by Eisenberger et al. in 1986. They defined POS as "employees' perception that the organization values their contribution and cares about their well-being" (Eisenberger et al., 2002, p. 565). In short, organizational support theory emphasizes that employees feel and perceive themselves safe in their institutions. This emerging trust enables employees to meet their social and emotional needs by increasing their productivity and to reconcile their general beliefs with the attitudes and beliefs of the organization (Eisenberger et al., 1986). The foundation of POS is based on social change theory (Blau, 1964). The reciprocity norm of social exchange theory argues that when individuals encounter positive behaviors, they react positively to these behaviors as an obligation (Gouldner, 1960). In this framework, an employee with a high perception of organizational support feels obliged to contribute to the organization in return (Eisenberger et al., 1998).

2.2 Work engagement

WE was first conceptualized by Kahn and defined as "dedication of employees to their work physically, cognitively, and emotionally" (Kahn, 1990, p. 694). After Kahn, different definitions of WE were made. To illustrate, Harter et al. (2002, p. 269) define the term as "the individual's involvement and satisfaction with as well as enthusiasm for work." According to Saks (2006, p. 602), who handled WE multi-dimensionally, WE is "a distinct and unique construct that consists of cognitive, emotional, and behavioral components that are associated with individual role performance." On the other hand, in the definition made by Schaufeli et al., which is frequently cited in the literature, WE is expressed as "a positive, fulfilling, work-related state of mind that

is characterized by vigor, dedication, and absorption" (Schaufeli et al., 2002, p. 74), whereby, "vigor is characterized by high levels of energy and mental resilience while working, the willingness to invest effort in one's work, and persistence even in the face of difficulties; dedication is characterized by a sense of significance, enthusiasm, inspiration, pride, and challenge, and absorption is characterized by being fully concentrated and deeply engrossed in one's work, whereby time passes quickly and one has difficulties with detaching oneself from work" (Schaufeli et al., 2002, pp. 74-75).

Although the terms "work engagement" and "employee engagement" are used interchangeably in the literature, work engagement is considered to be a more specific concept. While work engagement focuses on the employee-job relationship, employee engagement also includes the employee's relationship with his/her organization. However, in this case, confusion about the meaning is possible between the term work engagement and the concepts of organizational commitment and extra-role behavior (Schaufeli, 2013)[1]. To avoid this confusion, the term "work engagement" is used in this study.

2.3 Turnover intention

Turnover is the termination of business ties between the organization and the individual (Tett & Meyer, 1993). There are two types of turnover behavior: voluntary turnover and involuntary turnover. In the case of voluntary turnover, an individual initiates the process of terminating the business relationship with the organization, while the organization starts the act of dismissing or leaving the employee in involuntary turnover (Price & Mueller, 1981). TI occurs just before voluntary turnover and it is accepted as the strongest precursor of actual turnover behavior (Lee & Mowday, 1987; Mowday et al., 1984; Bartlett, 1999). Therefore, to understand the reason why employees leave their jobs, it is significant to determine which factors affect their intention to leave. The term TI is defined as "a conscious and deliberate willfulness to leave the organization" (Tett & Meyer, 1993). This intention can occur on a planned or unplanned basis and is determined by reference to a specific time frame. For example, an employee may state that he/she will quit the job at intervals such as the next month or next year. Organizations should attach importance to TI of employees due to its effect on the employee turnover rate.

1 Schaufeli, W. B. & Bakker, A. B. (2003). UWES Utrecht Work Engagement Scale. Utrecht University (November 2003)

3. Research hypotheses

3.1 The relationship between POS and TI

Many studies were identified in the literature examining the relationship between POS and TI. For example, Rhoades and Eisenberger (2002) found a negative relationship between POS and TI. Accordingly, within the framework of the reciprocity norm, the employee who perceives organizational support firstly feels the obligation to fulfill his/her responsibilities for the organization. Then, he/she develops positive thinking and organizational commitment towards the organization (Eisenberger et al., 2002). Thus, the employee with increased organizational commitment shows less turnover intention and behavior (Rhoades et al., 2001). In addition, Perryer et al. (2010) determined in their study that the relationship between POS and organizational commitment is an important determinant of TI, and employees with low organizational commitment are less likely to turnover if they receive high organizational support from their organization. In the study conducted by Joo et al. (2015), it was concluded that when employees perceive that the organization cares about their well-being (POS) and when they are assigned to a difficult or challenging job, they show less quitting behavior. In his research in Turkey, Yakut (2020) found a negative relationship between POS and TI. Lastly, research conducted by Islam et al. (2018), Wang & Wang (2020), and Giao et al. (2020) affirmed that POS is negatively correlated with TI. The following hypothesis was developed in line with previous research:

H1: POS negatively and significantly affects TI.

3.2 The relationship between POS and WE

Various studies in the literature revealed the presence of a positive relationship between POS and WE. One of the most important studies is Saks' work. In his study examining the antecedents and consequences of WE, Saks (2006) found that one of the strongest determinants of WE is POS, and based this relationship on social exchange theory. Another significant study by Rich et al. (2010) investigated the antecedents of WE and its effects on job performance and revealed that employees who perceive high organizational support are more engaged in their jobs. Murthy (2017) also determined in his study that there was a significant and positive relationship between POS and WE. Moreover, Özdemir et al. (2019) reported in their study that POS

has a positive effect on the sub-dimensions (vigor, dedication, and absorption) of WE. Finally, different studies conducted by Najemdeen et al. (2018), Kerse & Karabey (2019), and Imran et al. (2020) confirmed that there is a positive correlation between POS and WE. In this context, the following hypothesis was created:

H2: POS positively and significantly affects WE.

3.3 The relationship between WE and the TI

Since WE is defined as a positive, fulfilling, and work-related state of mind (Schaufeli et al., 2001), engaged employees are actively and intensely dedicated to their jobs with positive energy, and do not have negative thoughts like TI (Saks, 2006, p. 609). In their study, Schaufeli & Bakker (2004) concluded that job resources increase employees' WE and decrease their TI. Accordingly, job resources (e.g. job autonomy, performance feedback, and social support) are both internal and external motivation sources, as they encourage employees to develop and learn, and enable them to achieve their work-related goals. When employee motivation increases, they are more engaged in their work and thus think less about quitting. There are also other studies that detect a negative relationship between WE and TI (Shuck et al., 2011; Erdil & Müceldili, 2014; Gupta & Shaheen, 2017; De Simone et al., 2018; Lee et al., 2018; Erdirençelebi & Karataş, 2019; Zhang et al., 2020). In this context, the following hypothesis was formed:

H3: WE negatively and significantly affects TI.

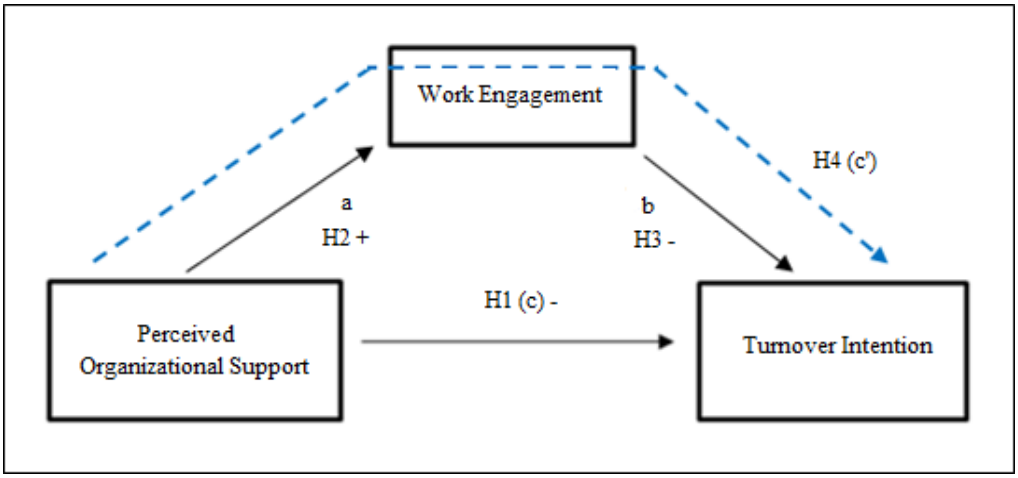
3.4 The mediating role of WE in the relationship between POS and TI

In addition to the direct effect of POS on TI, its indirect effect through WE was also examined in this study. In other words, within the framework of the reciprocity norm, it was thought that employees who perceive that the organization cares about their contributions and well-being will be more engaged in their jobs and thus will have less TI. There are different studies that have previously investigated this mediating effect. To illustrate, Thirapatsakun et al. (2014) found in their study that POS has an indirect effect on TI through WE. Also, Kumar et al. (2018) revealed that WE has a mediating role in the relationship between POS for employee self-development and TI. Besides, the study conducted by Nadeem et al. (2019) demonstrated that there is a negative relationship between POS and TI, a positive relationship between POS and WE, and a negative relationship between WE and TI, and that WE has a significant mediating role in the relationship between POS and TI. In their study, Putra and Surya (2019, p. 19) determined that POS has a significant negative effect on TI and a significant positive effect on WE; furthermore, WE has a significant negative effect on TI and a partial mediating role in the relationship between POS and TI. Accordingly, the following hypothesis was developed:

H4: WE has a mediating role in the relationship between POS and TI.

The research model created based on the hypotheses is given in Figure 1.

Figure 1 Research model



Source: Authors

4. Method

4.1 The aim and importance of research

Various studies have examined the relationship between POS and TI (Mathumbu & Dodd, 2013; Burns, 2016; Araya, 2015; Christianson, 2015; Bano et al., 2015; Caesens & Stinglhamber, 2014; Murthy, 2017). Some researchers handling this relationship suggested that future studies could include different variables in the model. In line with this suggestion, this study tried to reveal the mediating role of WE in the relationship between POS and TI. On the other hand, it has been determined that previous studies have investigated this mediating role (Nadeem et al, 2019; Putra & Surya, 2019; Kumar et al., 2018; Thirapatsakun et al., 2014).

4.2 Research universe and sample

The research universe was composed of 1,300 healthcare professionals working in Erzincan province of Turkey. Accordingly, the sample size was determined as 281 by predicting 95% reliability and 5% error margin for the universe size[2]. In this context, 450 questionnaires were distributed to the employees by using a simple random sampling method, and 427 complete and error-free questionnaires were analyzed. The data collection process in this research took 8 months.

4.3 Data collection and analysis

4.3.1 Data collection tools

The research questionnaire consists of two parts. The first part includes questions to determine the demographic characteristics of the survey participants. In the second part, there are questions about POS, WE and TI. The scales used in the study are explained below:

POS Scale: A 36-item POS scale developed by Eisenberger et al. (1986) was shortened by Armstrong-Stassen & Ursel (2009), and a 10-item validation study was conducted. Akkoç et al. (2012) adapted this abbreviated version to Turkish needs by removing two items (6 and 9) due to their low factor values. For this reason, an 8-item scale adapted by Akkoç et al. (2012) was used in this study.

WE Scale: Participants' WE was measured by using a 9-item scale developed by Schaufeli & Bakker (2003) and adapted to Turkish needs by Özkalp & Meydan (2015).

***TI Scale*:** The scale developed by Rosin and Korabik (1995) and adapted to Turkish needs by Tanrıöver (2005) was used to measure participants' TI. The scale consists of one dimension and 4 items in total.

Research questions were answered with a 5-point Likert-type scale (1-strongly disagree, 5-strongly agree). To determine the methods to be used in the analysis, the normality test was performed first. However, as a result of the normality test, it was determined that the data were not distributed normally, so non-parametric tests were used in data analysis. Reliability analysis, factor analysis, Spearman correlation analysis, SEM analysis, and mediator variable analysis were also applied in the study. The data obtained were analyzed through AMOS 17 and SPSS 22 software packages.

5. Results

5.1 Demographic findings

When the demographic characteristics of the participants are examined, 53.9% of the participants are female, 46.1% are male; 74% are married, 26% are single; 15.4% are in the 20-25 age range, 40.1% are in the 26-40 age range, and 44.5% are in the 41 and over age range. In terms of education, 32.3% of the respondents are high school graduates, 31.1% are associate degree graduates and 36.6% are undergraduate graduates. On the other hand, 8.7% of the participants are doctors, 34.4% nurses, 16.9% health officers, and 40% other healthcare professionals. With regards to the working time of the participants, those working 11 years, or more are in the majority (45.4%), there are 29.3% of those working 1-5 years, and 25.3% of those with 6-10 years of work experience.

5.2 Reliability and factor analysis results regarding the scales

Exploratory factor analysis results and reliability coefficients for the scales are given in Table 1. It can be seen from the table that the Cronbach Alpha coefficient of POS is above the reference value of 0.70 (0.945). The scale explains 72.431% of the total variance. The KMO value for the scale is 0.919 and the sphericity value is 0.000. These values meet the referenced values (KMO > 0.60 and sphericity value < 0.05). In addition, the Cronbach Alpha coefficient of the WE scale is above the reference 0.70 (0.874). The scale explains 52.775% of the total variance. The KMO value for the scale is 0.853 and

2 Sample Size Calculator. http://www.surveysystem.com/sscalc.htm

the sphericity value is 0.000. These values meet the referenced values (KMO > 0.60 and sphericity value < 0.05). Finally, the Cronbach Alpha coefficient of the TI scale is above the reference 0.70 (0.884). The scale explains 74.415% of the total variance. The KMO value for the scale is 0.794 and the sphericity value is 0.000. These values meet the referenced values (KMO > 0.60 and sphericity value < 0.05).

Table 1 Exploratory factor analysis results regarding the research scales

SCALE	Eigenvalue	Explained variance	Total variance	Cronbach Alpha	
POS	5.794	72.431	72.431	0.945	KMO = .919 Bartlett's test of sphericity (statistical value = 3094,542; p =. 000)
WE	4.750	52.775	52.775	0,874	KMO = .853 Bartlett's test of sphericity (statistical value = 2319,537; p = .000)
TI	2.977	74.415	74.415	0.884	KMO = .794 Bartlett's test of sphericity (statistical value = 974,142; p = .000)

Source: Authors

Confirmatory factor analysis was applied to the variables after exploratory factor analysis. The results are given in Table 2.

Table 2 Goodness of fit after modification for the variables

	χ2/df	RMSEA	CFI	GFI	NFI	TLI
POS	2.764	0.064	0.992	0.978	0.988	0.984
WE	3.294	0.073	0.990	0.981	0.985	0.976
TI	0.028	0.000	1.000	1.000	1.000	1.000

Source: Authors

The goodness of fit values in the table show that the reference values are provided, so the modifications improve the model fit. Therefore, the factor structure obtained by exploratory factor analysis is confirmed.

5.3 Findings regarding hypothesis test results

a) Correlation analysis

Relationships between the research variables were determined through correlation analysis. Since the data were not normally distributed, Spearman correlation analysis was preferred (Field, 2009). In this context, the obtained findings are given in Table 3.

Table 3 Correlation analysis (Spearman's rho) findings

Factors	X	SS		1	2	3
1-POS	2.742	1.101	Spearman's	1	.403**	-.303**
			P		0.000	0.000
2-WE	3.330	1.008	Spearman's		1	-.383**
			P			0.000
3-TI	2.354	1.180	Spearman's			1
			p			

* If p < 0.05, there is a 95% significance level relationship between the variables.
** If p < 0.001, there is a 99% significance level relationship between the variables.
Source: Authors

As can be seen in Table 4, there is a negative correlation between POS and TI at the 99% significance level (r = -0.303; p = 0.000). According to this finding, an increase in the POS levels of employees decreases their TI levels. However, employees with a low perception of organizational support may intend to quit more.

There is also a positive correlation (r = 0.403; p = 0.000) between POS and WE at the 99% significance level. This finding means that when employees have a perception that they receive support from the organization, they are more engaged in their work; on the other hand, when employees think that they do not receive support from the organization, their work engagement levels decrease.

Another finding in the table is that there is a negative correlation (r = -0.383; p = 0.000) between WE and TI at the 99% significance level. Accordingly, engaged employees tend to turnover less. Conversely, employees with low levels of engagement may intend to quit more.

b) Structural equation modeling analysis

In the research, a structural equation model was applied to the variables with the AMOS program. However, it should be determined whether there is a multicollinearity problem as a prerequisite of the analysis. For this reason, multicollinearity of the independent variables was examined first. The multicollinearity problem occurs when the variance inflation factor (VIF) of the independent variables is above 10 and the tolerance indices (the variance ratio that cannot be explained by the variables) are below 0.10 (Kerse & Karabey, 2019). As a result of the analysis, it was concluded that there is no multicollinearity problem since the VIF values of the independent variables POS and TI are below 10 and the tolerance indices are above 0.10 (Table 4).

Table 4 Multicollinearity regarding independent variables

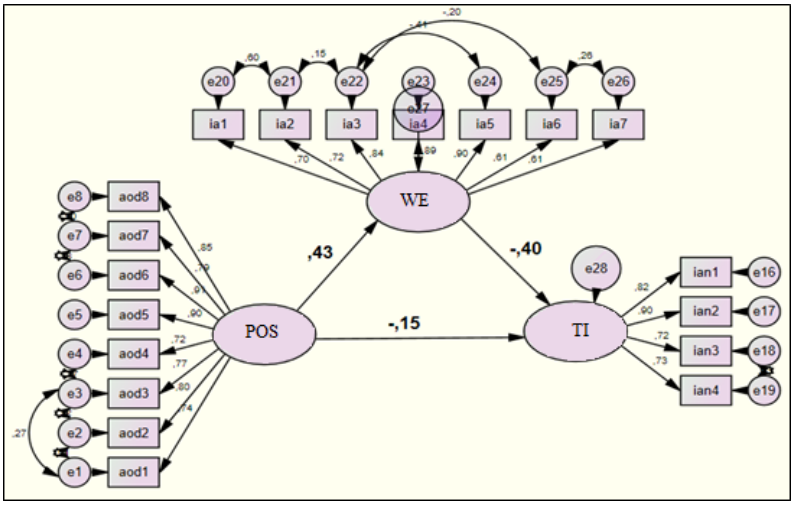
Independent variables	Tolerance	VIF
POS	.838	1.193
WE	.838	1.193

Source: Authors

As stated above, structural equation modeling analysis was performed to test the hypotheses. In structural equation modeling, POS, TI and WE were determined as the exogenous variable, the dependent variable (endogenous variable) and the mediator variable, respectively.

On the other hand, since the data were not distributed normally, the bootstrap method was used (Bayram, 2013, p. 106), while the sample and the bias-corrected confidence intervals were kept at 1000 and at 95%, respectively. Analyses were made by selecting the boost factor value as 1. The model estimation results are shown in Figure 2.

Figure 2 Research model estimation results



Source: Authors

The goodness of fit values for the research model are shown in Table 5. It can be seen in the table that the reference values are met.

Table 5 Goodness of fit values of the research model

Indices	Meaning	Reference value	Measurement model
CMIN/DF	Chi Square / Degrees of Freedom	$0< x^2/sd \leq 5$	1.607
CFI	Comparative Goodness of Fit Index	>.90	.987
RMR	Rock Mass Rating	<.1	.061
GFI	Goodness of Fit Index	>.90	.949
IFI	Incremental Fit Index	>.90	.987
TLI	Tucker-Lewis Index	>.90	.984
NFI	Normed Fit Index	>.90	.966
RMSEA	Root Mean Square Error of Approximation	<.05 RMSEA .08≤	.038

Source: Authors

The standardized factor loadings and bootstrap confidence intervals obtained in the basic model are summarized in Table 6. According to these values:

1- The effect of POS on TI is statistically significant at the 95% significance level,
2- The effect of POS on WE is statistically significant at the 99% significance level,
3- The effect of WE on TI is statistically significant at the 99% significance level.

The lower-level and upper-level values in the table demonstrate the intervals in which the independent variable affects the dependent variable.

Table 6 Factor loadings and bootstrap confidence intervals

Hypothesis	Dependent variable		Independent variable	Standardized factor l.	Lower level	Upper level	P
H1	TI	←	POS	-.15	-.254	-.053	.012*
H2	WE	←	POS	.43	.339	.509	.007**
H3	TI	←	WE	-.40	-.485	-.297	.008**

** If p < 0.01, the effect between variables is statistically significant at the 99% significance level.
* If p < 0.05, the effect between variables is statistically significant at the 95% significance level.
Source: Authors

Direct, indirect and total effects in the basic research model obtained by means of the bootstrap method are summarized in Table 7.

Table 7 Direct, indirect and total effects in the basic research model

Variables	Effects	POS	WE	TI
WE	Direct	**.43**	.000	.000
	Indirect	.000	.000	.000
	Total	**.43**	.000	.000
TI	Direct	**-.15**	**-.40**	.000
	Indirect	**-.17**	.000	.000
	Total	**-.32**	**-.40**	.000

Source: Authors

Hypothesis 1: POS negatively and significantly affects TI.

Values showing the relationship between POS and TI are given in Table 4, Table 7, and Table 8. The findings show that there is a negative correlation between POS and TI at the 99% significance level (Table 4; r = -0.303; p = 0.000) and that POS affects TI directly, significantly and negatively at the 95% significance level (Table 7; Standardized R.Y. = - 0.15; p = 0.012). Furthermore, the total effect of POS on TI is -0.32 (Table 8). This means that an increase in the POS levels of employees decreases their TI levels. Hence, the H1 hypothesis was accepted. This finding is in line with the results of previous studies (Galletta et al., 2011; Koster et al., 2011; Park et al., 2015; Joo et al., 2015).

Hypothesis 2: POS positively and significantly affects WE.

Values referring to the relationship between POS and WE are shown in Table 4, Table 7, and Table 8. Accordingly, there is a positive correlation between POS and WE at the 99% significance level (Table 4; r = -0.403; p = 0.000) and POS impacts WE at the 99% significance level directly, significantly and positively (Table 7; Standardized R.Y. = 0.43; p = 0.007). The total effect of POS on WE is 0.43 (Table 8). That is, when employees have the perception that they receive support from the organization, they are more engaged at work or vice versa. Therefore, the H2 hypothesis was accepted. This finding confirms the previous studies (Saks, 2006; Rich et al., 2010; Zacher & Winter, 2011; Biswas et al., 2013; Gillet et al., 2013; Caesens & Stinglhamber, 2014) that established a positive relationship between POS and WE.

Hypothesis 3: WE negatively and significantly affects TI.

Values showing the relationship between WE and TI are given in Table 4, Table 7, and Table 8. According to the findings, there is a negative correlation between WE and TI at the 99% significance level (Table 4; r = -0.383; p = 0.000) and WE affects TI at the 99% significance level directly, significantly and negatively (Table 7; Standardized R.Y. = - 0.40; p = 0.008). Furthermore, the total effect of POS on TI is -0.40 (Table 8). Accordingly, it can be said that employees with increased levels of work engagement are less likely to involve in turnover intentions. Therefore, the H3 hypothesis was accepted. This result coincides with the results of previous studies (Schaufeli et al., 2001; Schaufeli & Bakker, 2004; Saks, 2006; Koyuncu et al., 2006; Shuck et al., 2011; Agarwal et al., 2012; Erdil & Müceldili, 2014).

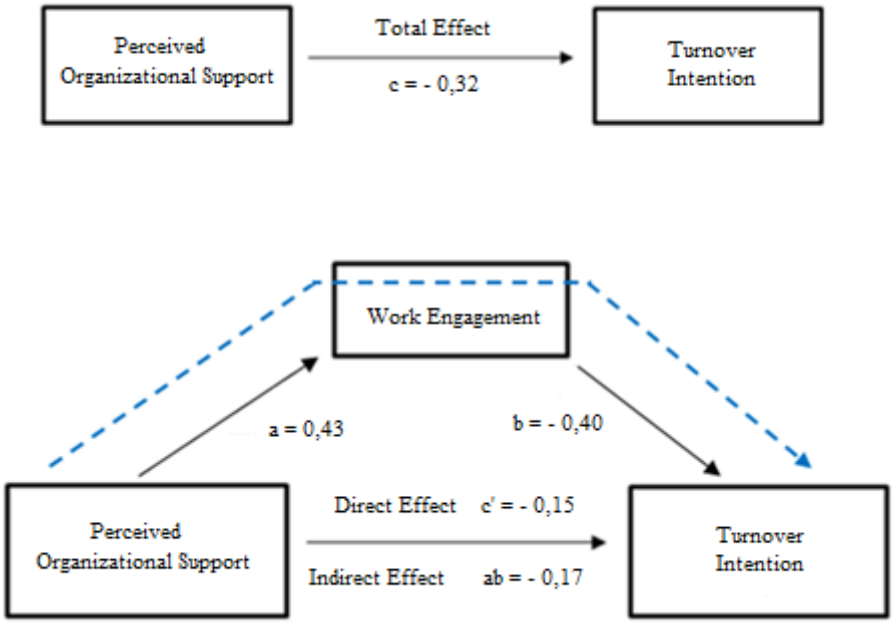
Hypothesis 4: WE has a mediating role in the relationship between POS and TI.

The conditions suggested by Baron and Kenny (1986) were used to reveal the mediating role of WE in the relationship between POS and TI. These conditions are as follows:

1. The independent variable (POS) must affect the dependent variable (TI). The H1 hypothesis satisfies this requirement (Figure 3, Direct Effect = -0.150)
2. The independent variable (POS) must affect the mediator variable (WE). The H2 hypothesis fulfills this requirement (Figure 3, Direct Effect = 0.430).
3. The mediator variable (WE) must affect the dependent variable (TI). The H3 hypothesis fulfills this requirement (Figure 3, Direct Effect = -0.400).
4. When the mediator variable is included in the analysis, a statistical decrease in the effect of the independent variable on the dependent variable indicates that there is a partial mediating role. The fact that the relationship between the dependent and the independent variable becomes statistically insignificant specifies that there is a perfect mediating role (Baron & Kenny, 1986).

In the model without the mediating variable, POS (an independent variable) affects TI (a dependent variable) at the level of -0.320. When WE (a mediating variable) is included in the model, the impact of POS on TI decreases and becomes -0.150. This can be explained by the fact that WE plays a partial mediating role in the relationship between POS and TI. According to the values in Table 8, the direct effect of POS on TI is -0.150, the indirect effect is -0.170 and the total effect is -0.320. It can be said that this indirect effect is caused by the "WE" variable. That is, WE has a partial mediating role in the relationship between POS and TI (Figure 3). Therefore, the H4 hypothesis was accepted.

Figure 3 Partial mediating role of WE in the relationship between POS and TI



Source: Authors

6. Discussion

Relationships between the POS, WE, and TI variables, as well as the mediating role of WE in the relationship between POS and TI were examined in this study. As a result of the analysis, it was seen that all hypotheses were supported. First of all, this study revealed a negative and significant relationship between POS and TI (H1). In other words, it was found that organizational support practices, such as thinking about their employee well-being and welfare, rewarding their good performance, valuing their ideas and opinions, listening to their problems, and trying to find solutions, are effective in employee turnover behavior. Secondly, this study determined that there is a positive and significant relationship between POS and WE (H2). Within this scope, employees who perceive a high level of organizational support tend to be more engaged at work. Thirdly, this study found a negative and significant relationship between WE and TI (H3). That is, employees who are dedicated to their jobs physically, cognitively, and emotionally are less likely to think about quitting these jobs.

Lastly, this study revealed that there is a partial mediating role of WE in the relationship between POS and TI (H4). In other words, employees who perceive that the organization cares about their contributions and well-being will be more engaged in their jobs and thus will have less TI. In this framework, when supervisors implement practices that ensure employee engagement in addition to providing organizational support to them, they can further reduce their TI. These practices may include enabling employees to take initiative in their jobs, following better wages policy, treating employees fairly and transparently, enabling employees to develop their skills through career planning, ensuring their participation in symposiums, congresses, or seminars related to their job, communicating and interacting with employees according to their personalities and giving importance to their health, etc.

7. Conclusion

This study examined relationships between the POS, WE, and TI variables, as well as the mediating role of WE in the relationship between POS and TI. The findings of this study provide evidence that em-

ployees' perceptions of organizational support and work engagement are effective in relation to their turnover intention. Furthermore, the results demonstrate that employees with perceived organizational support are more engaged in their work and thus less likely to quit their jobs. Therefore, in order to prevent employee turnover, organizations should not only implement organizational support policies but also ensure employee engagement.

8. Limitations

As in all studies, this study has some limitations. For example, due to cost and accessibility reasons, it covers only one industry and includes data for a single city. Future studies may expand the sample size by including employees from different sectors and different professions. Besides, future studies may compare health institutions in various regions or cities.

The mediating role of WE in the relationship between POS and TI was examined in this study. In future studies, new models can be established and tested with different mediating variables (e.g. organizational justice, leader-member exchange, employee jealousy, organizational trust, and organizational commitment) that will affect the relationship between these two variables.

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INTERNET USAGE AND RELATED BEHAVIOR PATTERNS OF PRIMARY SCHOOL CHILDREN: PERCEIVED DIFFERENCES BETWEEN GIRLS AND BOYS IN CROATIA

Abstract

Purpose: Children in the Republic of Croatia are, as everywhere else in the world, active users of information and communication i.e. digital technologies, which is reflected in their daily habits and routines in the digital environment. The purpose of this paper is to find out if there are gender-based differences in behavior and established habits in the digital environment between boys and girls.

Methodology: Quantitative research was carried out using the CAWI method among 400 parents or guardians in the Republic of Croatia who provided answers on (their own) children of primary school age. This paper focuses on the segment of children and their gender, i.e. the existence (or the lack of existence) of differences in the behavior of boys and girls in a digital environment. The statistically significant differences are demonstrated by testing various variables between the two above-mentioned segments.

Results: The research results indicate that, on average, girls and boys start to use the Internet at the same age, approximately at the age of 6. However, there are noticeable differences between the sexes in terms of the habits and in the way they use the Internet.

Conclusion: The conclusion shows that boys more frequently have desktop computers, laptops, and gaming consoles, and prefer to play online games and spend time in the online world, while girls more often post and publicly share photos, video records, and music. They equally use the Internet on weekdays, but boys spend more time on Internet activities on weekends.

Keywords: Internet use, children, digital environment, primary school age, behavior

1. Introduction

With the advent of information and communication technologies, a digital environment changes the way we communicate, how we perform work tasks and how we spend our free time. As digital transformation is changing the world every day, this also affects children on the daily basis, i.e. their behavior in the digital environment. Children's behavior is in a part a reflection of the society in which they are growing up and developing; the effect of digital technologies on them is logical and it is indisputable that the children of primary school age daily use both digital devices and the Internet

for performing various online activities. What has been less researched to date is the issue of whether there are gender-based differences in behavior and established habits in the digital environment. Comprehensive quantitative research, but also the testing of a series of variables between two different segments, girls and boys, will provide an insight into the research problem. Before the research itself, it will be shown whether there are differences in behavior between girls and boys. Other important insights into the interaction between children and digital technologies will be presented as well.

2. Children's behavior in a digital environment

Due to the vast amount of information children receive in the digital environment, but also because they use different parts of the brain to process information than the children born in previous generations, an expression *screenager* is starting to be used for children, i.e. they are considered as persons who are growing up "in front of the screens" (Jukes & McCain, 2007). In other words, modern generations are actually digital natives or "digital children". Spitzer (2018) points out that the term digital native is derived from the term native speaker which describes the fact that a mother tongue is learned differently and a person's command of a mother tongue is different compared to foreign languages.

Nierengarten (2018) points out that in 2011, only 10% of children up to 2 years used mobile devices, and in 2013, this value increased to 38%. In 2015, 97% of children up to 4 years of age used digital devices, and as much as 75% owned some device. According to the research carried out in 2017 in the Republic of Croatia, almost half of the children aged 9 to 11, 2/3 of the children aged 12 to 14, and 3/4 of children aged 15 to 17 can access the Internet whenever they want or need to (HR Kids Online, 2017). Dolovčak (2017) point out that 85% of households with pre-school children own a tablet, while 65% own gaming consoles. Children most often access the Internet via mobile phones/smartphones (Ciboci et al., 2020). Šmit (2020) states that 90% of children use mobile devices on a nearly daily basis, and 75% of them own a mobile device for personal use. 84% of children use a desktop computer or a laptop and 59.30% use a tablet. Kotrla Topić and Perković Kovačević (2015) provide in their research an insight into the relationship between socioeconomic characteristics and ownership of digital devices in the Republic of Croatia. The authors point out that the only reason why only half of the surveyed families own a tablet is due to their lower socioeconomic status.

It is certain that children's interactions with digital technology is all-pervasive, but there are differing opinions on the effects of such digital interaction. UNICEF (2017) states in its report that not using digital devices at all, just like their overuse, has a tendency towards negative effects, whereas moderate use has positive effects. Straker et al. (2009) point out positive effects of using digital devices, e.g. the role of computers in improved cognitive development and school achievements, reduced obstacles in social interaction, improving one's fine motor skills, etc. Radesky et al. (2015) state that digital devices may increase early literacy in children by their advanced features, if, for example, one uses educational applications or e-books for reading. However, most of the scientists agree on one thing, and that is the age limit, i.e. recommendations that the children should not use digital devices before the age of two. The same source also states that small children need to develop an inner self-regulation mechanism and that the benefits from digital devices are short-term, but also harmful for later social-emotional outcomes. On the other hand, Nierengarten (2018) points out negative aspects and effects on sleep, while Miličić (2018) warns of eye-sight problems. Badrić and Prskalo (2010) make a connection between the use of digital devices and reduction in physical activity among children. Nierengarten (2018) also mentions parent-child interaction problems associated with the overuse of technology, while Ribarić (2018) cautions against the negative effects of the free use of digital devices during classes in schools.

2.1 Internet activities children engage in

Duvnjak et al. (2016) noted that children spend 2 hours a day on workdays online and 3 hours a day during the weekend, while Šmit (2020) stated that during the usual workday children most often spend 30 to 60 minutes online (35.3%) and that this time usually increases during an ordinary day on the weekend to 2 to 3 hours (26.3%). Vuletić et al. (2014) established that 92% of participants aged 11 to 18 years give leisure and only 8% school obligations as the main purpose of using the Internet. Haddon and Livingstone (2012) stated that children use the Internet in order to communicate with friends, download various content, and research

material needed for school and studying. The use of ICT in education improves the motivation and attainment of both girls and boys, though the increases are more marked for boys than girls. (Becta, 2008). In the research results, Šmit (2020) also highlighted that watching video content is the activity children most often engage in, or specifically as much as 61.3% of the children on a nearly daily basis. Every day or almost every day, 46.3% of the children exchange messages using messaging services. It is important to note that the crisis caused by the COVID-19 pandemic, which is having an unprecedented effect on all spheres of life, also equally affects the education system and it can be assumed that distant learning classes, which had to start in a very short time, undoubtedly contributed to a completely different ratio related to the use of digital devices and the Internet in general, especially among the youngest population.

With regard to gender differences, the data suggest that male participants show a greater degree of Internet overuse (Üneri & Tanıdır, 2011; Livingstone et al., 2011; Dufour et al., 2016). There are different terms to describe this behavior, such as Internet addiction, pathological Internet use, and problematic Internet use (Yellowlees & Marks, 2007), while Robotić (2015) clarifies that there are lots of ways to use the Internet and therefore it follows that there are also so many different types of addiction on the Internet. As to digital addictions among children, the most common ones are related to playing games. Šmit (2020) notes that children most commonly download games once a month (26%), while they play games with other participants most often once a week (20.8%), as well as individually (30%). 40% of children never play online games with other participants. In 56.3% of situations encountered by children, the game made it possible for the child to communicate with other players. In 44% of situations, the game was downloaded for free, but required purchases to accelerate progress, while in 35.2% of situations, it was impossible to play the game without making purchases in the application despite the fact that the game was advertised as a free-to-play game. Kotrla Topić and Perković Kovačević (2015) state that in most cases the parents allow the children to use only free games and applications. Duvnjak et al. (2016) clarify that only 2.4% of participants in their research spend more than 10 hours a day playing games, but prevention should be focused on these individuals if game playing disrupts other daily functions. Children list entertainment and relaxation as the primary motivation for playing computer games. Lynch (2018) notes that online video gaming is more prevalent amongst boys than girls.

Furthermore, Chak and Leung (2004) pointed out a long time ago that there are gender differences when it comes to the selection of activities the children engage in online, where boys and girls are more attracted to playing games and to online communication, respectively. Boys have a tendency to reveal more personal information on social networks than girls (Fogel & Nehmad, 2009). Many parents of both boys and girls have witnessed striking differences in the way their kids use technology, with their sons generally gravitating to video games and their daughters often spending more of their screen time scrolling on social media (Jargon, 2019). Girls use social networks to communicate with persons from real life, unlike boys who often communicate with persons they do not know. Girls use social networks more frequently to communicate with friends (Fairlie, 2016), while boys find the purpose of using social networks in social compensation, learning, social identity building and leisure (Vlček, 2016). Šmit (2020) states that 27.3% of the children use social networks every day or almost every day. The same source also states that 48% of primary school children covered by the research never use social networks.

3. *Child safety and the implementation of safety measures*

In addition to active involvement in the Internet activities of their children, it is also recommended that parents implement restrictive measures depending on the age of the child. Almost 70% of participants state that the parents do not know a single password on the digital devices (Duvnjak et al., 2016). Šmit (2020) provides figures referring to the means the parents most frequently use for blocking or filtering certain websites (44.5%) and monitoring websites or applications used by the child (43.8%), as well as ad blocking software usage (41.5%). The application that sets limits to the time a child can spend on the Internet (28%) and parental control software that limits people who a child can come into contact with online (26.3%) are the applications least frequently used by the parents. Parents most frequently check the purchases made by their children within the applications (20.3%), although 19.5% of respondents never check these. What the greatest number of respondents fail to do is to check their child's e-mail messages or messages in some of the messaging applications. 23.3% of respondents do this very often, while 13% of them do

it all the time. 8.8% of respondents stated that they never check the websites their child visited. In their research, Lagator et al. (2018) highlight the fact that parents are stricter with their daughters and more permissive when it comes to their sons, i.e. they set more rules for their daughters and girls are more closely supervised when using the Internet. Haddon and Livingstone (2012) confirm that parents of daughters are more familiar with the websites and content they visit online compared to parents of sons, and parental monitoring of their children's Internet use takes place more frequently in the case of daughters than sons (Meehan & Hickey, 2016). HAKOM (2017) warns that having a clear and open conversation with a child is most important for the protection of the child online, even when parents do not suspect that there is a problem. Brezinšćak (2017) states that instead of direct supervision, an open relationship between the parent and the child and set rules are much more important for child safety, especially considering the fact that the children today can use the Internet without their parents present. As the child grows, supervision of online activities becomes less and less useful and starts to represent a threat to the relationship with the child, which is not the case with talking. According to Lagator et al. (2018), 90.2% of children claim that they follow their parent's rules referring to Internet usage. Radesky et al. (2015) point out the importance of Internet usage and parental (or any adult) monitoring and supervision during that activity, because when a parent is involved in their child's activities, it becomes normal for the child to talk about its experiences, whether positive or negative.

4. Research

The respondents of the conducted research were parents (or other household members familiar with daily habits) of the primary school age children because children at this age usually start to use digital devices independently and this very fact comes to the fore as an extremely sensitive group was under study. Children become curious to explore digital technology in their free time, while on the other hand, as of the 2020-2021 school year, the School for Life education reform (Divjak et al., 2019) requires the children in the Republic of Croatia to use digital devices in their educational institutions and when doing their homework, which consequently significantly changes their digital habits. The study included 400 respondents. According to the age structure, respondents were divided into two categories, i.e. younger (25-40) and older (41-64), and a higher percentage of respondents belonged to the older age group. 66% of female and 34% of male respondents took part in the study. It is not unusual that women, in general, participate more in the studies, especially in the cases where one needs to be familiar with children's habits, and these are mostly mothers. Considering the relationship with the child they were filling out the questionnaire for, as expected, the majority of respondents declared themselves as child's parents (80.3%).

4.1 Study methodology

The study methodology is based on the methodology of one part of the study by Lupiáñez Villanueva et al. (2016) "*Study on the impact of marketing through social media, online games and mobile applications on children's behavior*", which was carried out as part of the EU *Consumer Programme* by the European Commission in 8 EU member states. The representative research quality is based on 6 regions of the Republic of Croatia in which the study was carried out and according to gender and age groups.

Quantitative research was carried out using the CAWI method among the members of the HrNation panel. It took around 20 minutes to complete a highly structured quantitative questionnaire. Online research was carried out in the period between 1 and 21 March 2019. The goal of the study was to collect opinions on the following aspects:

- How the children use the Internet-access and devices;
- Parental perceptions of children's digital skills;
- Supervision of use and safety: active and restrictive;
- Perception of risks, seriousness of risks and vulnerability;
- Problematic online practices;
- Safety measures;
- Digital skills of the parents;
- Sociodemographic information.

The conducted study examined not only the differences in the habits of children, but also the effects of problematic marketing practices on the children, depending on their characteristics, including gender, age, socioeconomic status and family communication patterns, Internet skills, the use of digital devices and the impact of advertising on them. This paper focuses precisely on the children gender seg-

ment, i.e. the existence (or the lack of existence) of differences in the behavior of boys and girls in a digital environment. The statistically significant differences will be demonstrated by testing various variables between the two abovementioned segments. In order to make the analysis easier, and finally to reach certain conclusions on the presented research problem, the following research questions are asked:

- RQ1: Is there a difference between girls and boys in the average age when they first use the Internet?
- RQ2: Do girls and boys use the same digital devices to access the Internet?
- RQ3: Is there a difference between girls and boys in terms of the ownership of digital devices for their use?
- RQ4: Do girls and boys spend the same amount of time using the Internet during the workday?
- RQ5: Do girls and boys spend the same amount of time using the Internet during the weekend?
- RQ6: Is there a difference between girls and boys in terms of the choice of online activities in which they engage on a daily basis?

4.2 Study results

The study included a total sample of 400 parents or guardians who provided answers for (their own) primary school age children. According to respondent demographic characteristics (age, gender, location), the collected data are considered to be representative at the level of the Republic of Croatia. Answers were collected for 189 girls and 211 boys, i.e. in the total sample, there were 47.3% answers referring to girls and 52.8% to boys. The sample for both genders ranges between 6 and 14 years (i.e. primary school age) and there is no difference in average age between these two groups. Consequently, segments are homogeneous and mutually comparable.

RQ1:

Looking at the age as an important criterion on which children's behavior in the digital environment depends, leads to the need to know at what age a child first uses the Internet. As expected, the largest number of children came into contact with the Internet at senior preschool age, i.e. at the age of 5 (18%), but we also need to highlight the data that as much as 8.1% of children came into contact with the Internet when they were under two years old. Such information confirms assumptions and the opinion telling us that children are beginning to use the Internet at an increasingly earlier age.

The independent samples t-test shows that there is no statistically significant difference between boys and girls in the average age of their first Internet use, i.e. boys and girls come into contact with the Internet at approximately the same age, on average, when they are around 6 years old (x_M=5.92; x_F=5.70; t=-0.918; df=398; p=0.359).

RQ2:

In terms of digital devices children use to access the Internet, they most frequently use mobile phones or smartphones (91%), and desktop computers and laptops (84%). 59% and 29% of them access the Internet through tablets and gaming consoles, respectively. An intriguing piece of information is that only 8.3% of children use a smartwatch to access the Internet.

The Chi-squared test is used to determine whether girls and boys use the same digital devices to access the Internet. A noticeable difference can be seen in the use of a gaming console, where 40.8% of boys and 17.5% of girls use a gaming console to access the Internet (χ^2=29.606; df=2; p<0.001). According to the Chi-squared test, there is a statistically significant difference in the use of gaming consoles, i.e. the data show that compared to girls, a greater number of boys use a gaming console to access the Internet.

No statistically significant difference was detected in the use of other digital devices.

RQ3:

As to the ownership of digital devices for their use, the smallest percentage was recorded for the children who own their own TV set or a desktop computer or a laptop, because such devices are not expected to be owned by individual family members. However, 19.8% of the children do have their own TV sets and 39% of them own a desktop computer or a laptop. The highest percentage was recorded for the children who own a mobile phone or a smartphone (75%).

By comparing the ownership of different types of digital devices between girls and boys, it was found that a difference only exists with regard to the pos-

session of a desktop computer or a laptop, and a gaming console. According to the Chi-squared test, a statistically significant difference was detected in terms of the ownership rate for a desktop computer or a laptop, where a higher percentage of boys (44.1%) own a device in comparison with girls (33.3%) (χ^2=4.836; df=1; p=0.028). Also, a statistically significant difference was detected in the ownership rate of a gaming console, where again a higher percentage of boys (33.2%) own a console compared to girls (14.8%) (χ^2=4.836; df=1; p=0.028).

On the basis of answers to RQ3, it was determined that there is a difference in the ownership of digital devices between boys and girls, i.e. a higher percentage of boys own personal desktop computers or laptops and gaming consoles.

Table 1 Devices for personal use

Devices for personal use	Computer (desktop/laptop)		Gaming console	
	Boys	Girls	Boys	Girls
Yes	44.1%	33.3%	33.2%	14.8%
No	55.9%	66.7%	66.8%	85.2%
Total	100%	100%	100%	100%

Source: Authors' research

RQ4:

The time that children spend in front of digital screens is a popular topic in the modern scientific literature. Because of this, the term screen time, i.e. the time spent in front of a screen of any device was introduced. During the workday, the highest percentage of children in the Republic of Croatia spend from 30 minutes to 1 hour online (35.3%). The American Academy of Pediatrics recommends that preschool children spend exactly this amount of time online, with a gradual increase in time for school age children, in accordance with the age and school obligations (Attai et al., 2020). 31.3% of the children use the Internet for 1 to 2 hours, and 10% of the children use the Internet for less than 30 minutes.

According to the Chi-squared test, there is no statistically significant difference between girls and boys when looking at the time they spend using digital devices during a normal workday (χ^2=8.152; df=5; p=0.148).

RQ5:

Furthermore, according to the Chi-squared test, there is no statistically significant difference between girls and boys when looking at the time they spend using digital devices during a normal weekend day. 19% of boys and 12.2% of girls spend between 3 and 5 hours a day online, whereas 8.5% of boys and 4.2% of girls spend more than 5 hours a day online. According to the above stated, it can be concluded that on average, compared to the girls, the boys use the Internet more during the standard weekend day (χ^2=14.648; df=5; p=0.012).

Table 2 Frequency of Internet usage

Frequency of Internet usage	On a regular school day		On a regular weekend day	
	Boys	Girls	Boys	Girls
Less than half an hour	10.0%	11.6%	4.3%	5.3%
Between half an hour and 1 hour	33.6%	37.0%	19.4%	22.2%
Between 1 and 2 hours	29.4%	33.3%	28.9%	22.8%
Between 2 and 3 hours	18.5%	14.3%	19.9%	33.3%
Between 3 and 5 hours	6,6%	1.6%	19.0%	12.2%
More than 5 hours	1.9%	2.1%	8.5%	4.2%
Total	100%	100%	100%	100%

Source: Authors' research

RQ6:

After examining the time children spend using the Internet, it is important to differentiate between the Internet activities they engage in. Quantitative research data show that watching video content is the activity which the children most often engage in, specifically as much as 61.3% of the children on a nearly daily basis. Every day or almost every day, 46.3% of the children exchange messages by using messaging services and according to the above percentage, it is the second most frequent activity among children. 27.3% of the children use social networks every day, and only 18.0% of them use the Internet every day or almost every day when doing their homework.

By comparing a series of activities performed online by children, a statistically significant difference between boys and girls was detected only when performing one of the following three activities: playing online games with other participants, spending time in the virtual world, posting and public sharing of photographs, videos, and music.

The Chi-squared test shows a statistically significant difference between girls and boys in playing online games with other participants (χ^2=30.029; df=5; p<0.001). 22.3% of boys and 7.4% of girls play online games with other participants every day or almost every day, whereas 25.65% of boys and 15.3% do that at least once a week (but not every day). According to the above, boys play online games with other participants more often than girls, whereas 31.8% of boys and 49.2% of girls never do that.

The Chi-squared test shows a statistically significant difference between girls and boys in spending time in the virtual world (χ^2=34.111; df=5; p<0.001). 18% of boys and 5.8% of girls spend time in the virtual world every day or almost every day, whereas 21.8% of boys and 10.1% of girls do that at least once a week (but not every day). According to the above, boys spend time in the virtual world more frequently than girls, whereas 32.7% of boys and 55% of girls never do that.

The Chi-squared test shows a statistically significant difference between girls and boys (χ^2=11.680; df=5; p=0.039) in posting and public sharing of photographs, videos, or music (including social networks and messaging applications). 3.8% of boys and 9.0% of girls do that every day or almost every day, which shows that girls post and publicly share photographs, videos, or music more frequently than boys.

Table 3 Internet activities

Internet activities	Play games with other people online		Spend time in a virtual world		Put (or post) photos, videos or music online to share with others	
	Boys	Girls	Boys	Girls	Boys	Girls
Every day or almost every day	22.3%	7.4%	18.0%	5.8%	3.8%	9.0%
At least once a week (but not every day)	25.6%	15.3%	21.8%	10.1%	11.8%	11.6%
At least once a month (but not every week)	9.5%	11.1%	10.0%	8.5%	12.8%	11.1%
Less than once a month	6.2%	10.1%	7.6%	11.6%	12.3%	9.5%
Never	31.8%	49.2%	32.7%	55.0%	51.7%	56.6%
DK/DA	4.7%	6.9%	10.0%	9.0%	7.6%	2.1%
Total	100%	100%	100%	100%	100%	100%

Note: DK/DA means 'don't know'/'don't answer'.
Source: Authors' research

4.3 Discussion

Through answers to RQ1 no statistically significant difference was found between girls and boys in terms of the average age of their first Internet use. By means of RQ2 it was determined that more boys than girls use gaming consoles to access the Internet, and with RQ3 it was determined that, compared to girls, a higher percentage of boys own

a desktop computer or a laptop, or a gaming console. RQ4 and RQ5 show that there is no difference between the genders regarding the time they spend using digital devices during the usual workday, but during the weekend boys spend more time on the Internet than girls. In the National Research on the Safety of Children aged 9 to 17 on the Internet: HR Kids Online it was stated that no statistically significant difference between girls and boys was found in relation to the time spent on the Internet (Ciboci et al., 2020), which is a more general piece of information compared to that obtained in answers to RQ4 and RQ5, where a certain difference was detected in the time related to the weekend days. Furthermore, responses to RQ6 revealed a statistically significant difference between boys and girls when performing only three online activities. The first activities is playing online games with other participants, where boys play online games with other participants more frequently than girls. In this regard, boys in the Republic of Croatia are no different than boys in other countries, considering that boys outnumber girls when it comes to playing multiplayer online games (Lynch, 2018). Furthermore, there is a noticeable difference in spending time in the virtual world, where boys also engage in this activity more frequently than girls. Ciboci et al. (2020) identified that boys participate in a somewhat larger number in certain online activities compared to girls, and they associate this fact with greater media literacy of boys and the assumption that the more children engage in certain activities, the more skillful i.e. more competent they become, and therefore they become more self-confident when it comes to such use. What the girls do more frequently than boys is posting and public sharing of photographs, video records and music. In general, girls prefer social and creative use of ICT and like to work in a collaborative manner when using technology for learning, both in formal and informal context (Becta, 2008), and on the basis of this, it can be concluded that the girls have a greater preference for more frequent usage of social networks. In addition to the Republic of Croatia, a trend in the different choice of Internet activities in which boys engage compared to those in which the girls engage was also recognized elsewhere in the world and many parents attest thereto, where boys generally prefer playing video games and girls spend more time using social networks. Emerging research indicates that brain differences between males and females help account for the split (Jargon, 2019). Furthermore, the same source states that studies show that the aforementioned difference is neurological in nature, which in a way explains the difference in the choice of Internet activities between girls and boys and highlights that the identical difference in preferences is present in adults, i.e. men and women.

5. Conclusion

This paper is focused on a currently less researched area related to the digital influence on children's behavior, i.e. the existence of differences between girls and boys in their well-established everyday habits in the digital environment. Quantitative scientific research was carried out using the CAWI method between the members of the *HrNation panel*. The respondents were persons who live in a household with a child (aged 6 to 14) who uses the Internet, and it was usually one of the parents or other persons who are familiar with child's everyday habits. The study included a sample of N=400.

Comprehensive quantitative research generated data from which it can be seen that primary school-aged children in the Republic of Croatia are in general active users of information and communication, i.e. digital, technologies, which is evident in their common routines and the time they spend in the digital environment. While testing a series of variables between different segments, girls and boys, it provided answers to questions posed for the purpose of revealing differences (or the lack thereof) between genders. It was determined that there is no difference between boys and girls in the average age of the first Internet use, i.e. both boys and girls come into contact with the Internet when they are, on average, around 6 years old. The only difference between the genders is in the type of digital devices used to access the Internet, but only regarding the use of a gaming console, where more boys than girls use a gaming console. Regarding the ownership of digital devices, boys own desktop computers, laptops or gaming consoles more frequently than girls. When looking at the time spent on Internet activities, it is evident that there is no statistically significant difference between girls and boys in terms of the time they spend using digital devices during a normal workday, but there is a difference in the use of the Internet on weekends, i.e. compared to girls, boys on average spend more time online on the weekend. The difference between the genders was also noted in the choice of Internet activities

in which the children engage, where boys play online games with other participants and spend time in the virtual world more frequently than girls, who post and publicly share photos, videos, and music more frequently than boys.

The research was subject to certain limitations, such as the choice of the research method, i.e. the selection of the CAWI method, which made it more difficult to include persons of a lower educational level and from rural areas. Furthermore, the study covered more female than male respondents. However, in specific studies such as this (children's behavior), women (specifically mothers) are still more inclined to participate and provide comprehensive and full information than men. Regardless of this limiting factor, the study is representative on the gender level.

The study was carried out before the newly created situation caused by the COVID-19 pandemic, which caused significant changes to everyday life, including the everyday life of primary school-aged children. The obtained data point to the fact that children in the Republic of Croatia use digital technologies much less for learning and fulfilling their school obligations than for activities in their free time, but a sudden urge to introduce and continuously hold distance learning classes caused a drastic shift in the abovementioned ratio. It is difficult to foresee future trends, which will greatly depend on the epidemiological situation which is constantly changing, but it is obvious that certain changes have already occurred in the way of functioning, especially for children, since education is currently undergoing significant changes. Regardless of whether the instruction will take place in educational facilities or through digital tools from homes of both students and their teachers, it is important to value the use of information and communication technology as a privilege of the digital age in which we live. In addition to teaching processes, it would also be good to investigate the way in which children today, in this newly arisen situation, use the digital technologies in their free time and see if it enables them to cope more easily with potential problems they encounter.

The recommendation for further research is to investigate and find out whether boys and girls cope equally with the challenges caused by the pandemic and in what way, to what extent and by what activities digital technology can help them in the future.

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RATIO OF THE STRUCTURE OF HOTEL ONLINE BOOKING CHANNELS AND THE MONITORING OF THE QUALITY OF HOTEL WEBSITES IN A MULTIDIMENSIONAL SYSTEM: IDENTIFICATION AND DISTRIBUTION OF POTENTIALS

Abstract

Purpose: The purpose of this paper is to explore the potentials that can positively impact the success of a hotel online business by: (1) exploring the specifics of the internal structure of online booking channels in the hotel business, (2) identifying the value and distribution of the potential to increase hotel bookings through the hotel website, (3) identifying the potential by exploring the space for improving hotel website excellence, and (4) developing an innovative multidimensional metric for monitoring hotel website quality.

Methodology: This research was approached in a way that the issue is considered from two aspects. Firstly, the potential to improve the ratio value of the hotel online booking channel structure is observed. The survey in the Republic of Croatia was conducted by regions on a sample of 4* and 5* hotels. Secondly, the potential to improve a hotel business is considered as the possibility to improve the performance of a hotel website.

Results: The research results show the value and distribution of the potential which can be used for a positive impact on the hotel business. Furthermore, the use of the presented multidimensional metric model allows a clear recognition of the potential for the hotel website quality improvement.

Conclusion: It can be concluded that both aspects of the potential research (in addition to the research findings), open up numerous possibilities for conducting similar or more complex analytical procedures and a new empirical research.

Keywords: Hotel, online booking channels ratio, potential, website quality, Google ranking factors, search engine visibility

1. Introduction

As a business entity, every hotel wants as many bookings as possible through a direct sales channel. Why is that? There are no intermediaries. There are no commissions. It is as simple as that. It is a well-known story that always presents a challenge for further research. But do hotels need, should they or do they want to work without intermediaries? With all the science and "heartbeat" from the real industry/market, it is best to try to increase direct bookings and leverage all the "good" that online travel agencies can contribute as intermediaries (Fei et al., 2017; Chang et al., 2019; Hoisington, 2021) and encourage direct hotel online sales (Cloudbeds, 2021). The tourism market is increasingly driven by the development of information and communication technology. The introduction of computer reservation systems (CRS) and global distribution systems (GDS), followed by the unfolding development of the Internet and online distribution channels, have dramatically changed the best operational and strategic practices in the industry (Buhalis & Law, 2008). Technological development very often opens new business opportunities and changes the existing business concepts. This is also emphasized by Webb (2016), when he points out that both sales policies and pricing policies of the hotel industry need to constantly change and adapt to new business conditions. O'Connor (2019) states similar ideas when analyzing the aspect of future development of online booking/sales channels in hospitality and tourism.

2. Theoretical and conceptual background/ framework

One of the main intentions of a hotel as a business system is to sell as many rooms as possible at the best possible price (Connally, 2021). Knowing (1) where potential guests look for information about the hotel, (2) how potential guests think, find or look for information (Šimunić, 2017), and (3) being visible in these/those places/channels is key to drive sales, especially through online booking channels, which is also confirmed by Beritelli & Schegg (2016). There are two main groups of booking/sales channels for accommodation businesses: (1) direct booking channels (no intermediaries - no commission), and (2) indirect booking channels (there are intermediaries - there are commissions). Direct booking channels can be divided into online booking channels (a brand website, email, an Internet booking engine, a mobile application, social media) and offline booking channels (phone, walk in, etc.). Indirect booking channels are both online and offline: OTAs - online travel agencies, GDS - global distribution systems, metasearch websites, tour operators, travel agents, group organizers etc. In what follows, the above booking/sales concepts are distinguished and their main characteristics and triggers are highlighted.

2.1 Hotel booking concepts

Direct online booking channels – a hotel website (via a channel manager, a PMS - property management system, a site booking engine), email, travel blogs, travel forum, social media, online ads, guest reviews, etc. The commission is 0%, but there is a significant investment in website improvement and optimization (not only money, but also knowledge, time, tracking trends, following the evolution of the Google algorithm, tracking the importance of the Google ranking factor, which is the most important factor for hotels, etc.).

Indirect online booking channels – this model is now the primary concept and source of hotel bookings. These include OTAs (online travel agencies), MSE (metasearch engines), and GDS (global distribution systems). Within this concept, the most dominant OTAs are Booking.com (with a commission rate of 15% and above), Expedia (with a commission rate of 15% and above), Airbnb (with a 3% host service fee and a 6-8% guest service fee), Agoda (with a 15% commission rate), Hostelworld.com (with a commission rate of 15%), Trip.com (with a commission rate of 20%), Laterooms.com (with a commission rate of 15%), Edreams.com (with a commission rate of 20%), etc. (Hotel Minder Team, 2021). The most famous MSEs are Trivago, Kayak, Skyscanner, TripAdvisor, and Google. A hotel pays a fixed amount of money to metasearch engines for each click, determined by a bidding system (or the PPC, "pay-per-click", model). The question is: Is it worth it? The hotel has to calculate and decide that for itself (Thielin, 2020). The main GDSs are Amadeus, Sabre, Galileo, and Worldspan (belongs to Travelport). Looking at GDSs from the hotel

perspective, it is worth highlighting that (1) hotels usually offer their rooms 30% cheaper on GDS (compared to public rates), (2) central reservation services (CRS), such as Sabre, allow hotels to offer their rooms on all GDSs at the same time, and (3) small independent hotels usually do not need a GDS (Thielin, 2020). It can be concluded that in this concept OTAs are now the most dominant hotel booking channel with a commission rate of about 15% to 20% for each booking. The numerical and monetary quantification of this percentage (in the context of the potential to be redirected to the development of the online direct booking channel through the hotel brand website) is the basis of the research and the principle of monitoring the stochastic and dynamic internal structure ratio of hotel online booking channels.

Direct offline booking channels – "back to the past". This channel was a reality before the Internet and de facto the most normal way to do business. But you can still benefit from some of the advantages and findings from those days when the best marketing model was the one where it was important to try to go beyond expectations and keep customers highly satisfied to ensure they come back to the hotel directly.

Indirect offline channels – "also a partial return to the past". These channels were a reality and de facto the most normal way of doing business before the advent of the Internet. They still exist in an offline environment, but have moved much of their activity into the online sphere.

In order to successfully deal with the distribution of hotel booking channels, hotels should constantly study (in detail and from different aspects) all costs and exploit the different potentials of all booking channels, which is confirmed by Huang et al. (2019). As Ye et al. (2017) point out, hotels need to analyze in detail all positive and negative aspects of booking channels and develop a strategy that ensures the maximum positive impact on business performance, what is also confirmed by Lei et al. (2019).

3. Methodology

In this paper, the focus is on exploring online hotel booking channels with the main objective of identifying and measuring the potential to improve hotel business performance. In this context, two main aspects are analyzed: (1) the potential space for optimizing the internal distribution structure of online hotel booking channels in order to increase the share of direct online bookings in relation to indirect bookings through intermediaries (segmentation - country, destination level, local new, hotel groups or hotels), and (2) the potential space for improving the excellence of hotel website performance (Šimunić, 2020). The aim of the research is to obtain a clear and segmented picture of the spatial distribution of the potential for improving performance indicators in the hotel business. By considering the distribution of online booking channels as a stochastic and dynamic process, this paper will: (1) consider the trends and compare the characteristics of online booking channels in the hotel business, which Steinhauser & Bohne (2018) have already written about, (2) highlight the importance of the internal structure of online booking channels in the hotel industry, which has already been dealt with by Law et al. (2015) and Martin-Fuentes & Mellinas (2018), (3) highlight the value and distribution of the potential for a direct positive impact on hotel business performance, (4) emphasize the importance of knowing how the Google algorithm works for achieving a better position/visibility within search engine result pages, and (5) define the direction of metrics development (present a multidimensional model for website quality analysis and monitoring) to measure the potential for website quality improvement. In this context, the hypotheses of the paper are stated below.

3.1 Hypotheses

The following hypotheses are supplementary to the preceding part of this paper:

(H1) - Globally, worldwide and in Europe, the internal structural relationship of online hotel booking channels is significantly dominated by OTAs as the booking channel.

(H2) - In the Republic of Croatia (RH), the internal structure of hotel online booking channels is significantly dominated by OTAs as a hotel booking channel.

(H3) - Measuring the distribution of the potential to improve direct sales through the hotel brand website, which results from the internal structure of online hotel booking channels and manifests itself through the payment of commissions to online travel agencies, provides a precise, segmented insight into the value of the potential. At the same time, it provides the basis for (1) innovation in business policies and strategies, and (2) an integrated market presence and better destination management.

(H4) - Knowing how the Google algorithm works and how important Google ranking factors are as elements of a website, continuous measurement and monitoring of hotel website quality by using multidimensional metric models to measure the potential for improving website performance excellence ensures a more consistent, high-quality, and complex insight into the quality of hotel websites and improves the quality of the hotel website optimization process.

4. Basics, assumptions and research results

At the beginning of the research, the author reviews previous research and the relevant literature to determine the factual situation in the world, Europe and the Republic of Croatia. With the accelerated development of technology in the last 10 - 15 years (which is increasingly working on the transformation of all business sectors into the online environment), the focus is also on the trend (Feinstein, 2018) in the research of online hotel booking channels. The facts and data that had the most dominant and relevant effect for gaining new knowledge and important parameters about the distribution of online hotel booking channels were observed from the macro and micro aspect (the macro aspect: world/ Europe, the micro aspect: the Republic of Croatia).

4.1 Macro aspect

According to Prieto (2018), looking at the macro aspect depending on the region, the shares of OTAs and direct bookings in the structure of online hotel distribution booking channels in 2017 were as follows:

Table 1 Macro aspect – share of hotel online bookings through OTAs and hotel websites

Region of the world	Share of hotel online booking channels	
	OTAs	Hotel direct bookings
USA	50 %	50 %
EUROPE	**69 %**	**31 %**
LATAM (Latin America)	69 %	31 %
APAC (Asia Pacific)	72 %	28 %

Source: Edited by the author according to Prieto (2018) – [Statistics source: Phocuswright – phocuswright.com]

Depending on the region, OTAs account for between 50% and 72% of online hotel bookings.

In addition, D-EDGE Hospitality Solutions published statistics on The Rise of Direct Bookings over OTAs: Hotel distribution trends in EMEA and APAC (D-EDGE Hospitality Solutions, 2021) and presented the results of an empirical study conducted from 2017 to 2020. Due to the COVID 19 pandemic that took place during the study, 2020 is divided into 3 phases, where [P1 Phase 1] covers the period from January to February, i.e. before the pandemic, [P2 Phase 2] covers the period from March to May, corresponding to the first wave of global closure, [P3 Phase 3] covers the period from June to September, i.e. the phase of uncertain reopenings and cautious recovery. The purpose of the research was to understand what happens with the penetration of online booking channels in the hotel industry and to identify trends (Table 2).

Table 2 Website market share: the evolution of a combined OTA market share and a comparison of a website direct market share in Europe from 2017 to 2020

	Online booking channel	Values by years (in %)					Change (percentage points)
		2017	2018	2019	Avg. 2020		2017-2020
Website market share (%) : Comparison in % of realized revenues according to online booking distribution channels in Europe	**[a]** Web direct	**18.3**	**19.3**	**20.7**	[P1] 27 [P2] 32 [P3] 28	**28.4**	**+10.1**
	[b] Booking Group	51.8	48.2	45.5	[P1] 42 [P2] 45 [P3] 53	48.0	- 3.8
	[c] Expedia Group	17.0	18.5	18.7	[P1] 15 [P2] 10 [P3] 7	10.4	- 6.6
	[d] Other OTAs	4.3	4,5	4.8	-	4.9	+ 0.6
	Σ [b+c+d] - OTAs	**73.1**	**71.2**	**69**		**63.3**	- 9.8
Online Σ	**Σ** [a+b+c+d] - olDC	91.4	90.5	89.7		91.7	+0.3

Source: Edited by the author according to D-EDGE Hospitality Solutions (2021)

The following table presents a more complete insight into data on reservation revenue as a market share percentage by distribution channels in comparison to the EMEA and APAC regions.

Table 3 Hotel booking channel market share distribution (percentage of booking revenue after cancelation by channels: Europe and Asia Pacific [EMEA, APAC])

Channel	Region	2017 (%)	2018 (%)	2019 (%)	2020 (%)	Change + / -
Booking Group	EMEA	**51.8**	**48.2**	**45.5**	**48.0**	**– 3.8**
	APAC	32.4	40.2	38.5	35.9	+ 3.5
Website direct	EMEA	**18.3**	**19.3**	**20.7**	**28.4**	**+ 10.1**
	APAC	23.9	26.8	28.1	35.8	+ 11.9
Expedia Group	EMEA	17.0	18.5	18.7	10.4	– 6.6
	APAC	15.8	16.2	15.9	9.1	– 6.7
Wholesalers	EMEA	5.5	5.9	5.8	4.4	– 1.1
	APAC	2.7	3.7	2.9	2.1	– 0.6
Other OTAs	EMEA	**4.3**	**4.5**	**4.8**	**4.9**	+ 0.6
	APAC	2.6	10.8	12.1	15.6	– 8.0
Other sources	EMEA	3.2	3.7	4.3	4.0	+ 0.8
	APAC	1.6	2.4	2.5	1.5	– 0.1

Notes: (1) EMEA – Europe, Middle East and Africa, (2) APAC – Asia, Pacific.
Source: Edited by the author according to D-EDGE Hospitality Solutions (2021)

Hypothesis (H1): Based on the presented data (Table 1, Table 2, Table 3), it can be concluded that at the levels of the world and Europe, the sale/booking of hotel facilities through online travel agencies dominates in the internal structure of hotel booking channels (with an average value of about 70%). Based on these facts, hypothesis 1 is fully accepted and proven.

4.2 Micro aspect

In the following, from the micro aspect, the issue of recognizing and distributing the potential for further booking improvement through a hotel direct online booking channel (website) at the level of the Republic of Croatia is discussed (Vukasović & Mihač, 2021). For a better insight, the data is compared with data relevant to Europe and the world.

4.2.1 Distribution of hotel online booking channels in the Republic of Croatia

This part of the author's empirical research (a micro aspect) is also based on the data analysis of the internal structure of hotel booking channels in Croatia (Benchmark FMTU, 2020; Mihač, 2019; PHOBS Central Reservation System, 2020).

Table 4 Share of online bookings by channels

Distribution of hotel online booking channels	
Booking channel	**Share (%)**
Brand website	**19.23 %**
OTA	**66.72 %**
B2B module	1.35 %
Distribution channels (metasearch, etc.)	0.74 %
GDS	0.1 %
RezApp	11.86 %

Source: Edited by the author according to (1) PHOBS CRS, (2) Mihač, 2019, and (3) Benchmark FMTU, 2021

The following table shows the sample structure and data on the distribution of online booking channels for 2019. The data refers to 5* hotels in the Republic of Croatia.

Table 5 Hotel online booking channels: structure sample and distribution (5* hotels in the Republic of Croatia)

Sample structure in relation to hotels in the Republic of Croatia			Sample structure in relation to 5* hotels in the Republic of Croatia			Distribution of online booking channels of the observed sample	
Σ Hotels in RH	**Number of hotels in the sample**	**%**	**Σ Hotels with 5* in RH**	**Number of hotels in the sample**	**%**	**Hotel brand website**	**Online travel agencies (OTAs)**
737	41	5.56%	47	41	87.23%	**22.1 %**	**65.4 %**

Source: Edited by the author according to (1) PHOBS CRS, and (2) the Ministry of Tourism and Sports of RH

In order to identify and measure the potential for improving the structure and distribution of the online hotel booking channel, the following data show the business performance of hotels (key performance indicators) for the Republic of Croatia compared with the data for Europe and the world (Table 6).

Table 6 Hotel key performance indicators for 2019: Comparison of the Republic of Croatia with the situation in Europe and the world

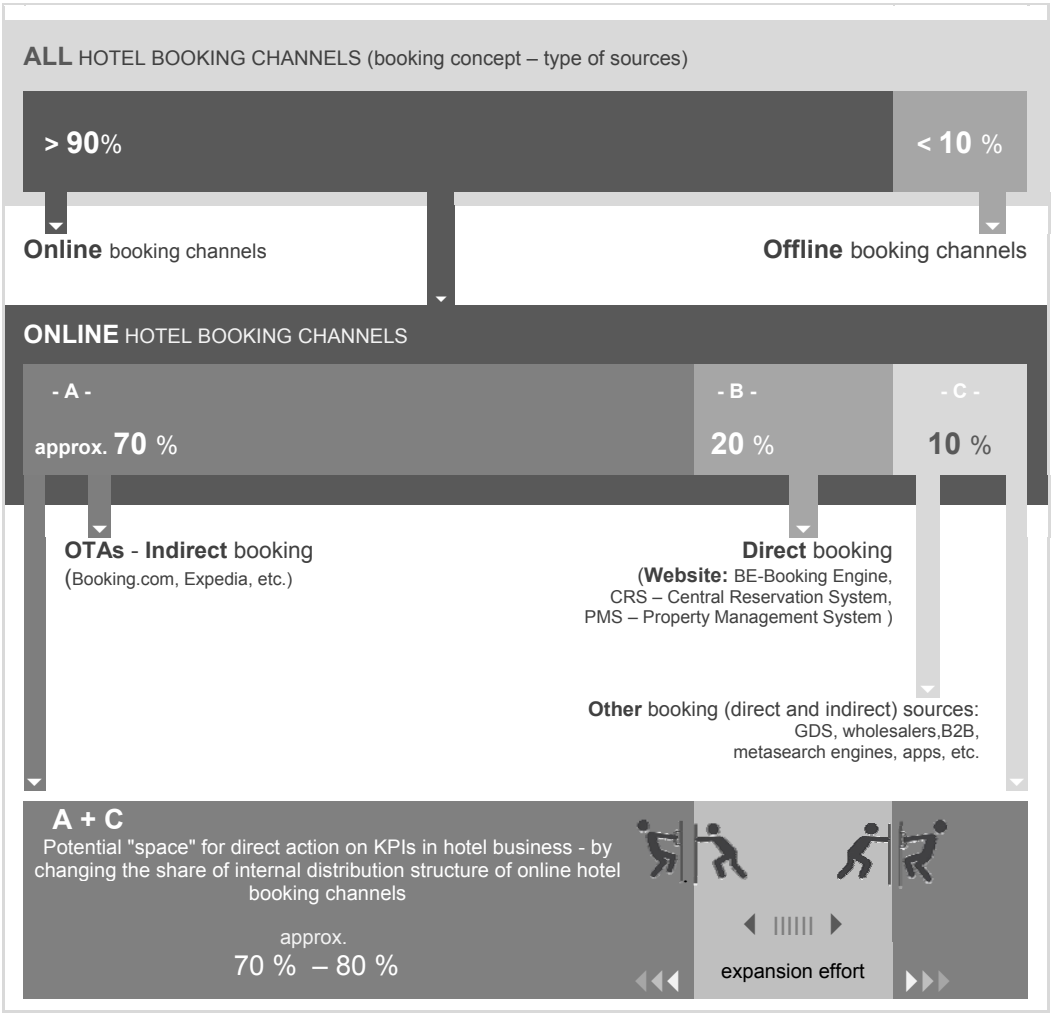
Hotels	Average occupancy (full capacity %)	ADR	RevPAR	TrevPAR	Total revenue per overnight
Croatia Avg.	**52.91**	**93.44**	**52.21**	**78.47**	**79.77**
5* Hotels in RH	**60.50**	**154.62**	**87.72**	**131.08**	**127.75**
4* Hotels in RH	**53.97**	**86.21**	**50.21**	**76.93**	**75.56**
Europe	**72.00**	**129.7**	**93.71**	-	-
World [2]	**67.85**	**122.44**	**82.9**	-	-

Notes: (1) Data for the RH & Europe in EUR, data for the world in USD, (2) Data for the world – average (Asia Pacific, Americas, Europe Middle East/Africa 94.69), (3) Avg. occ. – Average occupancy rate, (4) ADR – average daily rate, (5) RevPAR – revenue per available room, (6) TrevPAR – total revenue per available room.
Source: Edited by the author according to (1) the Croatian Hotel Industry Benchmarking, and (2) Statista, 2021

Hypothesis (H2): Based on this part of the research and the presented data (Table 4, Table 5 and Table 6), it can be seen that hotel capacity bookings through OTAs (online travel agencies) are dominant in the Republic of Croatia (about 65%). These facts prove hypothesis 2 of this paper.

The following figure shows the distribution of the total hotel booking channel by source type (booking concept - source type).

Figure 1 Booking channel distribution concepts (source type) – Internal structure



Source: Author

In general, it should be stressed that of the total number of bookings in the online environment, about 70% are made by OTAs, about 20% by direct bookings (mostly referring to the website) and the remaining 10% by other booking channels. This range (70% - 80%) indicates that there is potential for action in relation to booking strategies to improve hotel performance. The following two tables (Table 7 and Table 8) show the calculation of the hotel business potential value and distribution.

Table 7 Overview of real hotel booking market size as a potential to improve the distribution structure of online booking channels in the hotel business (2019 by region)

	Avg. occ. %	**ADR**	**NoH**	**TNoR**	**Σ ARMV**	**Online hbMV** 90%	**Offline hbMV** 10%
	a	b	c	d	e = a*b*d*365	f = 90% of e	g = 10% of e
World	67.85	122.44	700,000[1]	16,970,000	514,194,848,796.00	462,775,363,916.40	51,419,484,879.60
Europe	72.20	129.7	146,616[3]	6,845,604	233,333,507,636.64	210,000,156,872.98	23,333,350,763.66
Σ Croatia	52.91	93.44	737	60,414	1,090,187,120.61	981,168,408.54	109,018,712.06
5* Hotels RH	60.50	154.62	47	6,322 (10.5% of Σ)	215,858,124.60 (19,8% of Σ)	194,272,312.14	21,585,812.46
4* Hotels RH	53.97	86.21	337	30,633 (50.71% of Σ)	520,226,484.94 (47,7% of Σ)	468,203,836.44	52,022,648.49
RH Istria	51.67	92.42	51	8,764	152,756,485.91	137,480,837.32	15,275,648.59
RH Kvarner	43.00	84.71	89	7,194	95,645,916.99	86,081,325.29	9,564,591.70
RH Continent	70.58	68.92	63	4,268	75,778,184.82	68,200,366.33	7,577,818.48
RH Dalmatia	54.27	113.98	181	16,729	377,703,770.12	339,933,393.10	37,770,377.01

Notes: (1) Data in EUR (data for the USA in USD), (2) Avg. occ. - Average occupancy rate, (3) ADR - Average daily rate, (4) NoH - Number of hotels, (5) TNoR - Total number of rooms, (6) ARMV - Actual realized market value, (7) Online hbMV - Real value of online hotel booking channel market size, (8) Offline hbMV - Real value of offline hotel booking channels market size.
Source: Edited by the author according to (1) Statista (2021), (2) Chappell (2021), (3) Lock (2020), (4) the Croatian Hotel Industry Benchmarking project FMTU 2021, (5) Mihač (2019), (6) the Ministry of Tourism and Sports of RH

The data shown in Table 8 are derived from Table 7.

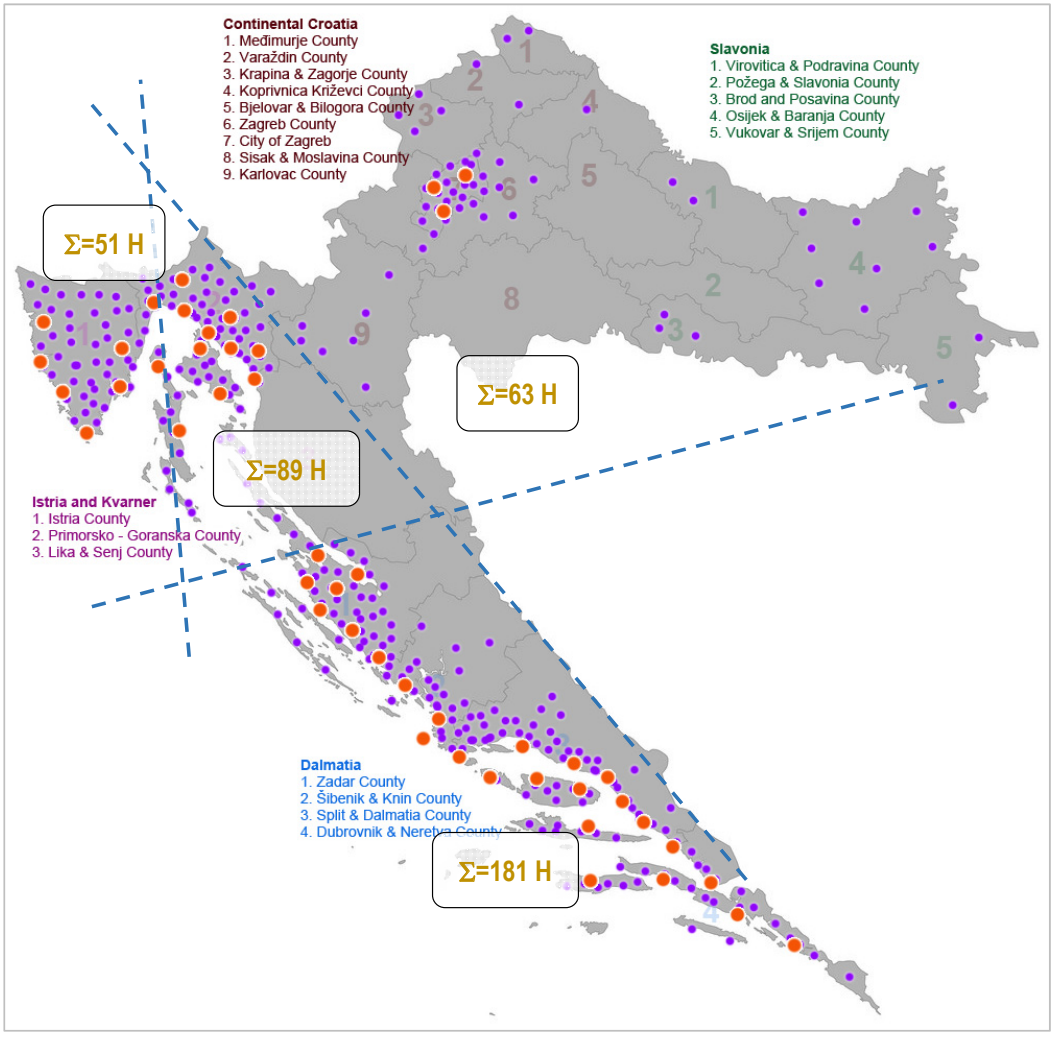
Table 8 Distribution of the online booking potential value according to booking channels for 2019 (based on the 70/20/10 booking channels ratio)

Potential according to online booking channels and OTA commission paid					
Region	**Online hbMV** (90%)	**Distribution of online booking channels**			**COMM O**
		IOn hbMV booking (70%)	**DOn hbMV booking** (20%)	**OOnCDI** (10%)	
	a	b = 70% of a	c = 20% of a	d = 10 % of a	e = 15% of b
World	462,775,363,916.40	323,942,754,741.48	92,555,072,783.28	46,277,536,391.64	48,591,413,211.22
Europe	210,000,156,872.98	147,000,109,811.09	42,000,031,374.60	21,000,015,687.30	22,050,016,471.66
CROATIA	981,168,408.54	686,817,885.98	196,233,681.71	98,116,840.85	103,022,682.90
5* Hotels - RH	194,272,312.14	135,990,618.50	38,854,462.43	19,427,231.21	20,398,592.77
4* Hotels - RH	468,203,836.44	327,742,685.51	93,640,767.29	46,820,383.64	49,161,402.83
RH - Istria	137,480,837.32	96,236,586.12	27,496,167.46	13,748,083.73	14,435,487.92
RH -Kvarner	86,081,325.29	60,256,927.70	17,216,265.06	8,608,132.53	9,038,539.16
RH - Continent	68,200,366.33	47,740,256.43	13,640,073.27	6,820,036.63	7,161,038.46
RH -Dalmatia	339,933,393.10	237,953,375.17	67,986,678.62	33,993,339.31	35,693,006.28

Notes: (1) Data for the world in USD, other in EUR, (2) Online hbMV – Online hotel booking channel market value, (3) IOn hbMV – Indirect online hotel booking channel market value, (4) DOn hbMV – Direct online hotel booking channel market value, (5) OOnCDI – Other online direct and indirect booking channel market value, (6) COMM O – Commission paid to OTAs: Potential for the restructuring of hotel booking channel distribution.
Source: Author

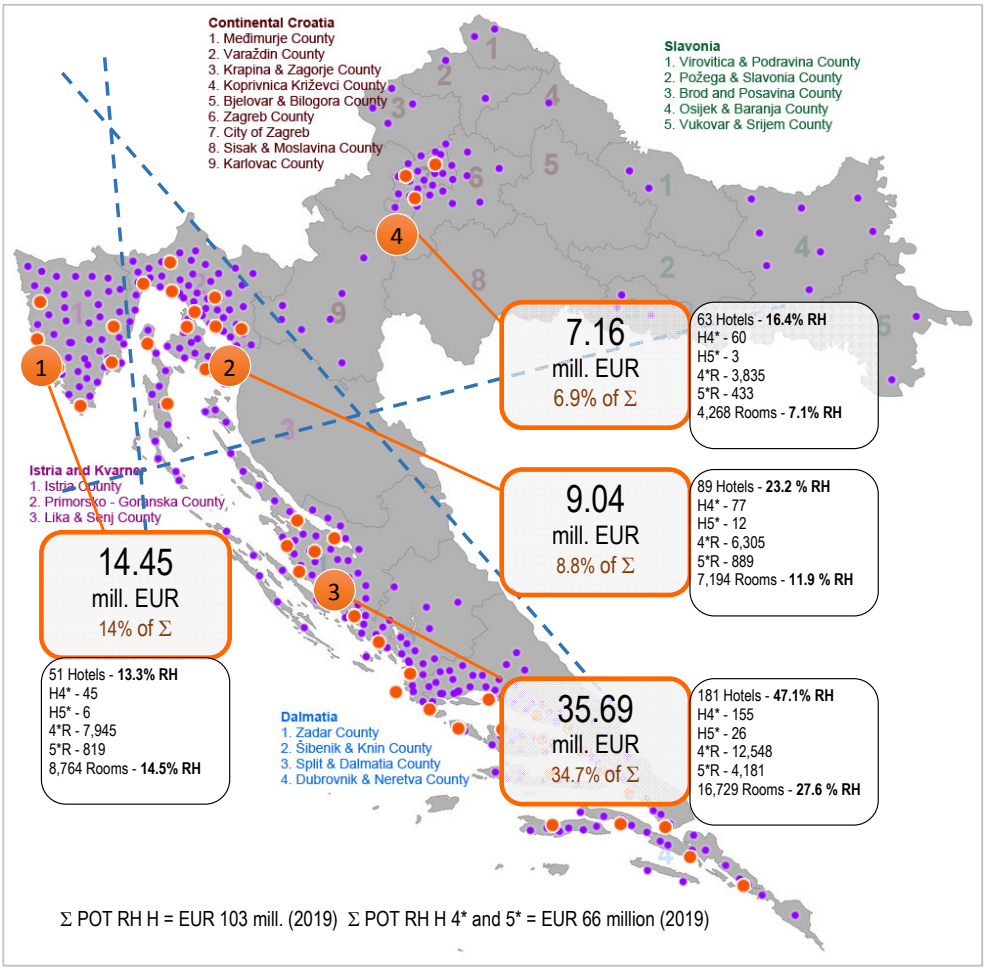
The data shows that the total value of commissions paid to online travel agencies worldwide was about USD 48.5 billion (about EUR 39 billion) in 2019. Europe accounted for about EUR 22 billion of the said amount. In 2019, the Republic of Croatia paid EUR 103 million in commissions to OTAs. For this paper, an empirical study was conducted on a sample of 4* and 5* hotels in the Republic of Croatia. The following two figures clearly show (1) the distribution of 4* and 5* hotels in the Republic of Croatia by region (Figure 2), and (2) the identification and distribution of the potential for action/investment of funds for correcting the structural ratio of hotel online booking channels in favor of the website as the most important online direct booking channel (based on commissions paid to online travel agencies) (Figure 3).

Figure 2 Spatial distribution of 4* and 5* hotels in the Republic of Croatia



Source: Author

Figure 3 Overview of total potential distribution (commissions paid to OTAs) by region of the Republic of Croatia



Notes: Calculation of the potential based on 4* and 5* hotels in the Republic of Croatia.
POT – Potential
Source: Author

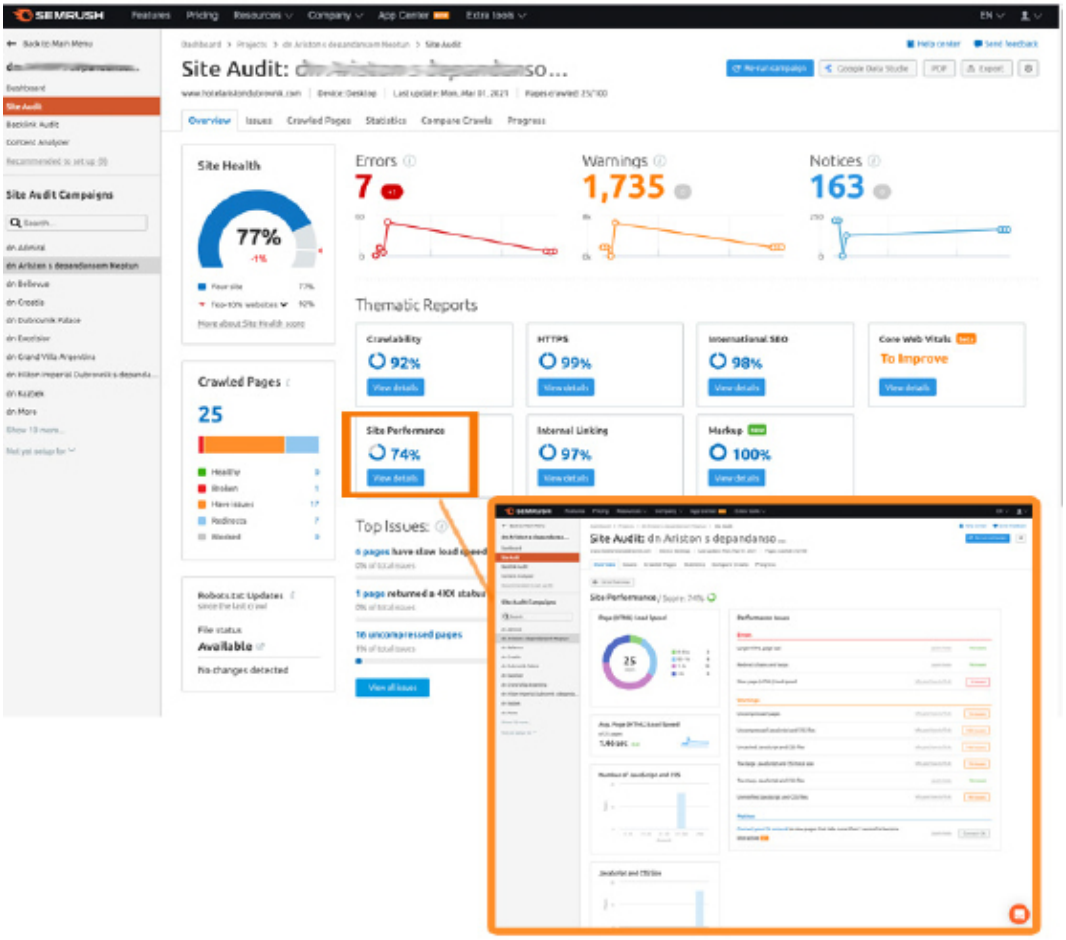
Hypothesis - (H3): Based on the data given in the previous graphs, there is a clear overview of the distribution of the potential to improve direct online sales through hotel websites (resulting from the payment of commissions to OTAs). It can be seen that this approach to capacity development (which can monitor the distribution of the potential in the state, region/destination, a hotel, a group of hotels, etc.) certainly provides a better basis for (1) the innovation of the hotel business policies/strategies, (2) the integrated performance in the supply market, and (3) better destination management, which also proves hypothesis 3 of this paper.

4.2.2 Hotel website and search engine visibility

The hotel brand website is the most valuable booking channel for a hotel. Each hotel website has its own qualitative value determined by Google algorithms based on the quality of Google ranking factors (Robinson, 2019). These factors are either directly or indirectly related to the website. It is important to optimize as many factors as possible and

constantly monitor them with appropriate metrics. Kakkar (2015) writes about this topic, explains Google algorithms and focuses on website optimization processes. The value of the website is crucial in the context of search engine visibility, which is addressed by Shaolong et al. (2019) and Pan (2015), who emphasize the importance of search engine visibility, especially in tourism. Nowadays, there are many professional software packages that help to improve online visibility and discover many different marketing insights such as Semrush, Ahrefs, Google Search Console, SpyFu, Screaming Frog, etc.). The author uses Semrush Software as a Service all in one tool (a guru license) for the needs of this research. Software like Semrush allows users to analyze the quality of websites by measuring a large number of different variables (site performance, crawlability, SEO, linking, etc.). Such tools help hotels as business entities to improve their work by means of search engine optimization. Its main advantage lies in a detailed analysis and presentation of a large number of different parameters, but according to the observed business unit/website. Each analysis process consists of a number of subprocesses that perform analyses according to a variety of different criteria (see an example in Figure 4).

Figure 4 Semrush site audit analysis and site performance subanalysis



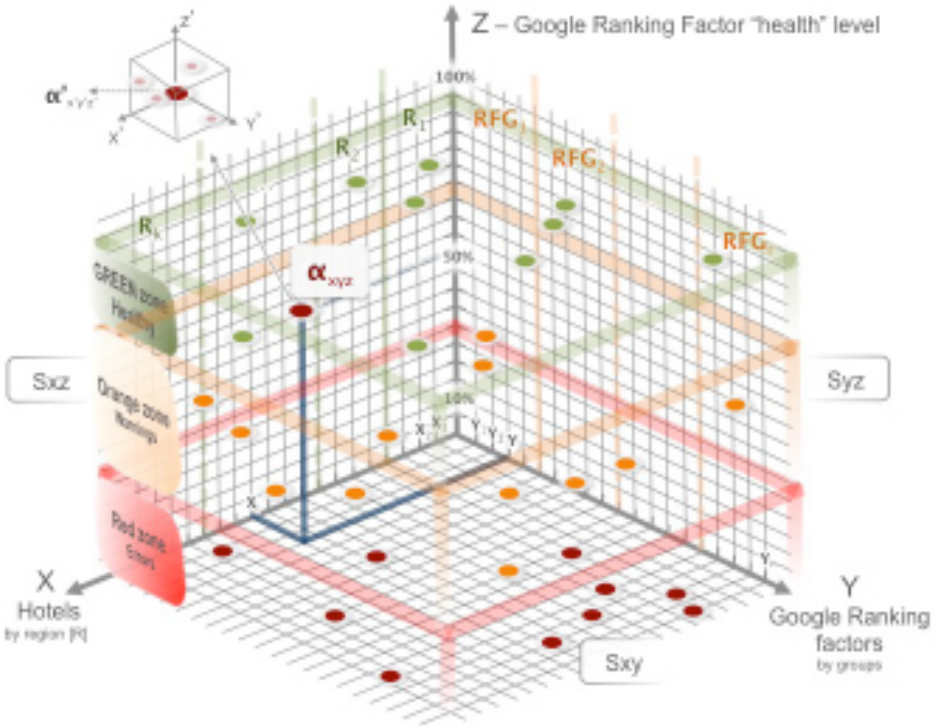
Source: Author

By summarizing all facts, conclusions and aspects mentioned so far, there is a complementary conceptual model of metrics for measuring and analyzing the quality of hotel websites (individually, segmented according to various criteria, etc.) in a multidimensional system.

4.2.3 *Multidimensional website quality metric model – MDWSQmm*

The multidimensional metric model presented in this section is based on observing the evolution, quality and impact of the Google algorithm ranking factor on visibility within the search engine, which Barysevich (2020) writes about and highlights the Page Experience Update as the biggest Google update of the year. The Google algorithm has over 200 factors categorized into corresponding groups (Domain Factors, Page-Level Factors, Site-Level Factors, Backlink Factors, etc.) (Brian, 2020). The Google search engine algorithm factors are stochastic and dynamic. This means that their individual value can change several times a day, always according to an unpredictable scenario. However, one thing is for sure: optimizing more factors provides better visibility in search engines. This should be the intention of every hotel as a business system. The following figure simply shows a conceptual multidimensional metric model for tracking, displaying and analyzing the quality level of Google ranking factors as elements of a website. The results obtained by the above-mentioned specialized software for a complex, in-depth analysis of the state of the website are entered into a database, from which they are transferred (for the purpose of further monitoring and analysis) to the presented multidimensional system.

Figure 5 MDWSQmm - A multidimensional metric model for monitoring and analyzing the quality of the Google ranking factor as an integral part of a hotel website



Notes: x - hotels, y - Google Ranking Factors, z - Google ranking factor health audit value, Sxy - a set of points in the xy plane, Sxz - a set of points in the xz plane, Szy - a set of points in the zy plane, RFG - Google Ranking Factors group, region/destination - Google factor, α_{xyz} - qualitative characteristics of the hotel website ("health" level of the specific website element/Google ranking factor).
Source: Author

Within the framework of the presented multidimensional metric model, qualitative zones (green, orange and red) can be observed in the planes (xy, xz, yz) of the system (S). The concentration of points in a given zone is a qualitative representation of the observed variables (e.g., an individual hotel, a group of hotels, destinations, groups of Google ranking factors, etc.). In the presented multidimensional system, the following organized data sets are observed, which can be used in many different (simple and complex) analyses.

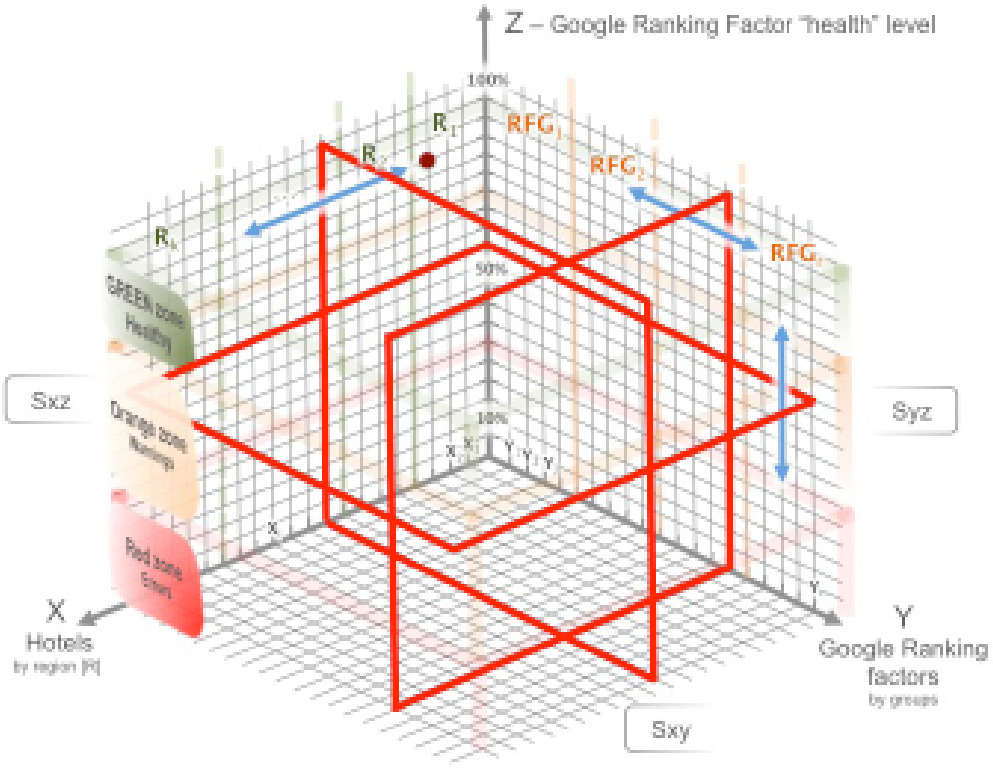
4.2.3.1 Set S – a set of points of a multidimensional system (MDWSQmm model)

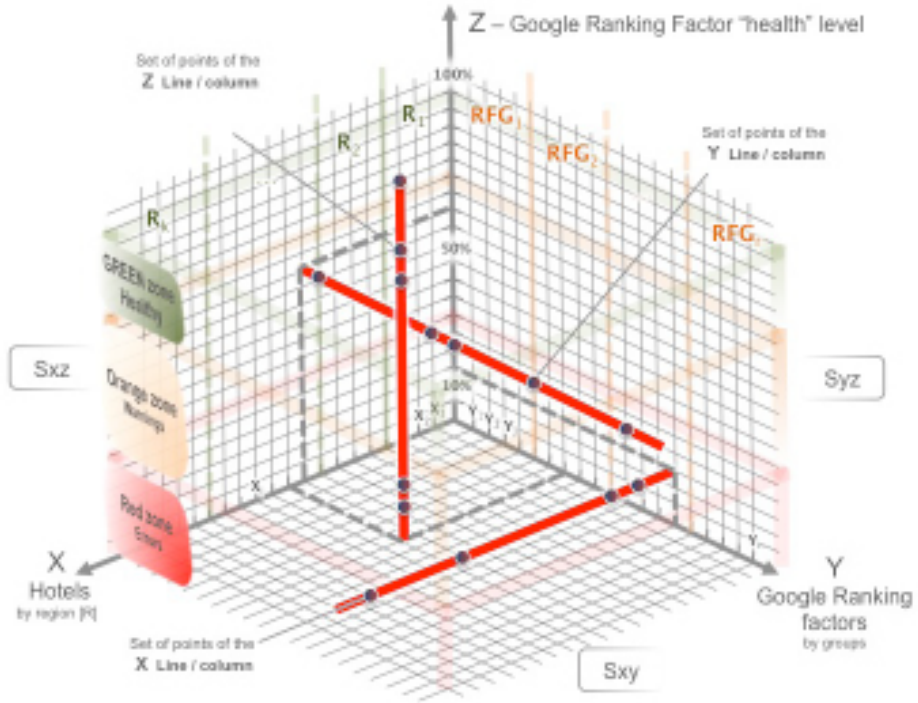
The presented MDWSQmm model allows an unlimited number of different simulations and analyses by simply inputting or dropping variables into or from the represented system. The set S represents all points of the multidimensional system (in this case, these are the characteristics of all observed hotels and all observed Google ranking factors by qualitative values defined by points α_{xyz} of the xyz prism and the expression $S = \{\alpha_{xyz}\}$, where x = 1, 2, 3, ..., m, y = 1, 2, 3, ..., n and z = 1, 2, 3,... r, 100%.

4.2.3.2 Planes of a multidimensional system (MDWSQmm model)

The multidimensional system of metrics presented below is presented by individual planes and columns/line/pillars.

Figure 6 MDWSQmm - Characteristic planes and columns/pillars of a multidimensional metric model for monitoring and analyzing the quality of Google ranking factors as elements of websites





Source: Author

The presented MDWSQmm model is based on the knowledge of the Google algorithm and Google ranking factors as elements of the website, whose quality should be constantly monitored, evaluated and optimized (without their knowledge and analysis, it is not possible to enter values into the presented MDWSQmm as a system). The proposed multidimensional system of monitoring and presenting website quality metrics according to different criteria and variables allows us to monitor individual qualitative characteristics of the hotel website (α_{xyz}) through individual and group analyses of individual characteristics by the presented levels or columns of the system. Moreover, if necessary, the model can be further expanded by developing new multidimensional systems as subsystems of the presented system/points as system features ($\alpha'_{x'y'z'}$).

Hypothesis - (H4): This confirms hypotheses 4 and 5 that the use of multidimensional metric models such as MDmWSQm for the analysis and quality monitoring provides an additional and complementary value to existing specialized software for website analysis and optimization. The use of the MDMMS model provides a more consistent, high-quality and complex insight into the quality state of hotel websites and improves the quality level of the hotel website optimization process.

5. Conclusion

Every hotel wants to sell as much of its accommodation capacity as possible through direct distribution channels. Today, more than 90% of accommodation capacity is sold/booked through hotel online booking channels. Of this figure (i.e. 90%), on average, between 70% and 80% of accommodation capacity is booked through OTAs, which charge a commission for their services (approximately 15-20%). In this paper, the commission paid to OTAs is specifically studied and considered as a potential for hotels to redirect part of these funds to website development, in favor of implementing new technologies, exploring new business models and business policies at all levels (a hotel, a hotel group, a region/a destination, a country). To improve success in a hotel business, the ratio between the realized ratio of online

bookings through OTAs and the hotel brand website should be changed in favor of the hotel brand website. Empirical research shows how large this online booking potential (OTA payments) is at all observed levels. Achieving a better balance between third-party bookings such as OTAs and direct bookings can help modern hoteliers to improve their key performance indicators, maximize revenue, and take full advantage of projected market growth. At the same time, this paper focuses on exploring the potential of how to improve the performance of the hotel website, which is the most profitable channel for online hotel booking. The paper presents an innovative model for analyzing and monitoring website quality (MDmWSQm model), which enables the performance of various metric processes by representing and analyzing data in a multidimensional system. Through individual planes and columns of the multidimensional system, it is possible to qualitatively look at a large number of different variables (Google ranking factors as qualitative elements of the hotel website) simultaneously in order to identify room for improving the performance of the hotel website. Simultaneous recognition and exploitation of the potential arising from (1) the internal structure of hotel online booking channels, and (2) room for improving the quality of individual elements (or groups of elements) of the hotel website as google ranking factors will certainly elevate a hotel business to a higher level.

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ORGANIZATIONAL FOUNDINGS, DISBANDINGS, AND THE COVID-19 PANDEMIC: EVIDENCE FROM THE TURKISH CONSTRUCTION SECTOR

Abstract

Purpose: The present study aims to understand the effect of the macro-level economic phenomena observed within a specific time interval on the founding (birth) and disbanding (deaths) of organizations in the construction sector of Turkey that has been growing steadily for many years. In addition, the effects of the COVID-19 pandemic were also taken into consideration.

Methodology: The construction sector in Turkey was analyzed within the framework of the theoretical infrastructure of organizational ecology, i.e. a theoretical perspective that has not received enough attention, except in North America, as an organizational community, while joint-stock, limited, and cooperative companies were also analyzed as organizational populations. Focusing on the period between January 2017 and December 2020, a number of foundings and disbandings of joint-stock, limited and cooperative companies operating in the construction sector, the house price index and house sales statistics, which are thought to affect these rates, were used as data. Additionally, the COVID-19 pandemic period between March 2020 and December 2020 was included in the analysis as a dummy variable. The ARDL bounds test was used for data analysis.

Results: The findings indicate differentiated effects of the house price index, house sales statistics, and the COVID-19 period on both the organizational community of the construction sector and the aforementioned populations.

Conclusion: The results, which are expected to contribute to business economics and organizational theories, studies on the construction sector, knowledge of the evaluation of socioeconomic effects of the COVID-19 pandemic and future studies, were obtained in the study.

Keywords: Organizational ecology, organizational foundings and disbandings, Turkish construction sector, COVID-19, ARDL bounds test

1. Introduction

In the late 1970s, organizational ecology theory, which emerged by distinguishing the key points from highly popular theoretical explanations in that period, built this differentiation based on two columns. In the first column, organizational population ecology expanded the term "organization", which is a traditional research object and unit of organizational analysis, and included "organizational population" and "organizational communities" as the units of analysis in the literature (Carroll, 1984; Hannan & Freeman, 1977, 1989). Accordingly, organizations that live in the same environment within a specific social system during a specific historical period are gathered under "organizational forms" parallel with the concept of "species" in biology. It was also emphasized that the organizations sharing the same organizational form together generate their own "organizational populations" (Aldrich & Ruef, 2006; Baum, 1996; Baum & Amburgey, 2002; Baum & Shipilov, 2006; Romanelli, 1991). Organizational populations generate *"organizational communities"* with other populations existing in the same environment and organizational communities constitute an ecosystem together with a social and economic system (Baum, 1996; Baum & Amburgey, 2002; Baum & Shipilov, 2006; Hannan & Freeman, 1989).

The second fundamental column differing this from other theories is its adoption of the "natural selection" approach rather than "adaptation" used in other theories regarding the relationship between an organization and its environment (Aldrich & Ruef, 2006; Amburgey & Rao, 1996; Baum, 1996; Baum & Amburgey, 2002; Baum & Shipilov, 2006).

Therefore, the organizational ecology approach pays special attention to organizational foundings (births) and disbandings (deaths) (Aldrich & Ruef, 2006; Baum, 1996; Baum & Amburgey, 2002; Baum & Shipilov, 2006; Hannan & Freeman, 1987, 1988; Önder & Üsdiken, 2007). The factors affecting organizational foundings (births) and disbandings (deaths) are explained by means of three categories: *demographic* factors such as size and age, *ecological* factors such as population density and population dynamics, and *environmental* factors such as technical, legal and political factors.

It may be said that many empirical studies have been carried out on the factors affecting the foundings (births) and disbandings (deaths) of organizations (Baum & Amburgey, 2002; Baum & Shipilov, 2006). However, it can be seen that these studies are usually subjected to testing the *demographic variables* such as size and age, and *ecological variables* such as population density and population dynamics. In return, it is emphasized that the studies on *environmental variables* such as corporate, technical, legal and political elements have not been sufficiently carried out (Önder & Üsdiken, 2007, p. 189). Thereby, in the organizational ecology literature, it appears that the effects of *environmental variables* such as corporate, economic, technical, legal and political elements on the foundings (births) and disbandings (deaths) of organizations are not sufficiently focused on. Additionally, it is stressed that the organizational ecology approach is a theoretical perspective that has not received adequate attention, except in North America, where it originates from (Önder & Üsdiken, 2007, p. 191; Üsdiken, 1995).

Within the framework provided by the organizational ecology approach, the present study tries to understand *the effect of economic phenomena observed within a specific time interval on foundings and disbandings of organizations in the construction sector that continued to expand consistently for a long time in Turkey*. Besides, it endeavors to scrutinize *the effects of the COVID-19 pandemic as a dramatic phenomenon that has created macro-level economic, political and social effects all over the world in the same period*. At this point, it is thought that the COVID-19 pandemic presents a unique research area to be able to understand the "selection and retention" processes that organizational ecology theory especially emphasizes (Aldrich & Ruef, 2006; Amburgey & Rao, 1996; Baum, 1996; Baum & Amburgey, 2002; Baum & Shipilov, 2006).

It is anticipated that this study can contribute to the following points:

a) The fact that the foundings (births) and disbandings (deaths) of organizations that have a significant place in the framework of organizational ecology theory, which has not received sufficient attention outside of North America (Önder & Üsdiken, 2007, p. 191; Üsdiken, 1995), have not been adequately studied especially when it comes to the effects of macro-environmental variables,

b) Studies in the field of construction that have tried to analyze its relationship with the economy over the macro-economic data many times, but have not adequately mentioned organizational foundings (births) and disbandings (deaths) in the sector as a dependent variable,

c) The effects of COVID-19 that has suddenly affected the whole world on the field of economics.

Within this framework, focusing on the period between January 2017 and December 2020, a number of founding and disbanding *joint-stock, limited* and *cooperative* companies, and the *residential property price index (RPPI)* and *house sales statistics (HSS*) that are considered to affect them, were used as data in this study. Additionally, the COVID-19 pandemic period was included in the analysis as a dummy variable. The Autoregressive Distributed Lag (ARDL) approach designed by Pesaran and Shin (1999) and Pesaran et al. (2001) was used in data analysis.

2. Socioeconomic context: The construction sector in Turkey and COVID-19

Both in the world and in Turkey, it appears to be a widely accepted opinion that the construction sector is one of the locomotives of the economic structure. The share of the construction sector in Turkey in economic growth has been steadily increased, especially after 1980 (Kolsuz & Yeldan, 2014). A report published in 2018 stated that by the year 2017 the share of the construction sector in the global economy was about 10-12%. In Turkey, this share was about 8-9% for the same year. It is estimated that by the year 2025 the share of the construction sector in the economic structure will be 10% and 16-17% for developed and developing countries, respectively (Zengin, 2018).

It is possible to indicate that research into the relationship between the construction sector and economic development has a very old history (Giang & Sui Pheng, 2011). These studies mostly focus on the relationship between gross fixed capital formation or the outputs, such as added value, related to the construction sector and the total outputs, such as GDP or GNP (Giang & Sui Pheng, 2011). However, research into environmental factors influencing the foundings and disbandings of construction organizations appears to be an area that has not been adequately addressed.

The coronavirus (COVID-19) outbreak that started in China at the beginning of 2020 has spread all over the world in a very short time. The World Health Organization (WHO) declared this situation as a Public Health Emergency of International Concern at the end of January.

In the case of such a shock that suddenly affects the whole world, different reactions of countries and specifically the reflections of these reactions on economic life seem to have been the subject of various academic studies even when the crisis has still been ongoing. These studies generally focused on the relationships between the pandemic and economic data (e.g. Akhtaruzzaman et al. (2021), Al-Awadhi et al. (2020), Ali et al. (2020), Ashraf (2020a, 2020b), Baig et al. (2021), Phan & Narayan (2020), Salisu et al. (2020), Topcu & Gulal (2020), Zhang et al. (2020)). In these studies, it is understood that the possible influence of the pandemic on the foundings (births) and disbandings (deaths) of organizations have not yet been the subject of research. Just as organizational ecology theory emphasizes, the COVID-19 pandemic precisely points out a dramatic "selection and retention" (Aldrich & Ruef, 2006; Amburgey & Rao, 1996; Baum, 1996; Baum & Amburgey, 2002; Baum & Shipilov, 2006) process that is impossible to be anticipated in terms of organizational populations and that provides a significant opportunity for research. Based on this quality, the environmental conditions created by the COVID-19 pandemic also laid the groundwork for our study.

3. Data, method and model

The data used in this study include a number of foundings and disbandings of joint-stock, limited and cooperative companies operating in the construction sector, obtained from TOBB statistics and the RPPI and HSS, which are considered to affect these numbers and which are taken from the Electronic Data Delivery System (EVDS) of the Central Bank of the Republic of Turkey (TCMB).

In the Turkish legal system, companies have been subject to various regulations, primarily the Turkish Commercial Code (TCC, 2011). Within the framework of the regulations,

a) *Joint-stock companies* are defined as capital company organizations that bring large capital accumulations together and rank first in terms of capital load.

Limited companies are defined as capital company organizations that can be established with smaller capital accumulations compared to joint-stock companies and rank first in terms of the number.

Cooperative companies are defined as organizations established to protect the interests of shareholders rather than gain profit.

b) Although it is stated in the TCC that all three organizational forms are commercial companies (TCC, Article 124(1)), the main regulations regarding cooperative companies are placed in cooperative laws.

c) Although joint-stock and limited companies, whose main regulations are part of the TCC, share some similar characteristics, they differ from each other due to the provisions which they are subject to, such as the maximum number of shareholders, the minimum capital amount required for their founding, the financial responsibilities of shareholders, regulations regarding tax legislation, their rights to go public, the structures of management bodies and the rules regarding a share transfer (Erdem, 2012; Kızılot, 2012).

Within this framework,

a) based on the premise that "even though organizations subject to different laws and regulations (...) have a similar organizational form, they must be considered separately" (Önder & Üsdiken, 2007, p. 142), *cooperative companies* were treated as *a separate population,*

b) although their basic regulations are included in the same law, it seems necessary that *joint-stock* and *limited companies,* which are clearly seen as separate organizational forms based on their structural differences, *were treated as individual populations* in this study.

The RPPI is an index that includes price changes on the housing market in Turkey and is formed by using the price data for all houses subject to sale in its calculation (TCMB, 2021a). HSS is a data set that includes the number of first sales and second-hand sales of houses throughout Turkey (TCMB, 2021b). The COVID-19 pandemic period was included in the analysis as a dummy variable. For the founding and disbanding statistics and the RPPI and HSS data, the study focused on the period between January 2017 and December 2020; the dummy variable, i.e. the COVID-19 period, was defined as the period between March 2020 and December 2020. It should also be underlined that the reason for not examining more variables except the RPPI and HSS is to prevent the degrees of freedom from falling below 30. Since the data used in the analyses have different scale structures, they were included in the analysis by taking their natural logarithms. Descriptive statistics of the data set are presented in Appendix A - Table A1.

The Autoregressive Distributed Lag (ARDL) bound testing approach developed by Pesaran and Shin (1999) and Pesaran et al. (2001) was used to examine the relationship between the number of foundings and disbandings of joint-stock, limited and cooperative companies in the construction sector and the RPPI and HSS variables. It was also used to evaluate the effects of the COVID-19 pandemic on these numbers. ARDL bound testing is an approach used in examining long- and short-run effects between variables, or more importantly, in testing whether there is cointegration between variables. In this approach, the stationary levels of variables do not have to be the same. It is sufficient for some variables to be stationary at the level, i.e. integrated I(0), or for other variables to be stationary at the first difference level, i.e. integrated I(1). However, this approach cannot be used for variables with integrated level I(2). At the same time, the condition that the dependent variable must be at the level of I(1) proposed by Pesaran et al. (2001) was loosened with a generalized ARDL bound testing approach upgraded by McNown et al. (2018). In this context, McNown et al. (2018) calculated new t and F critical values for the degenerated dependent variable problem that emerged when the probability value corresponding to the t-statistic, showing the significance of the dependent variable, is not consistent with the t-distribution. Generalized Dickey-Fuller (ADF) and Phillips-Perron (PP) stationary test results of the variables used in this study were given in Appendix A - Table A2. According to the results, it is determined that none of the variables are I(2). The equation of ARDL bound testing used for cointegration between variables is as follows:

$$\Delta Y_t = \alpha_0 + \sum_{i=0}^{p} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=0}^{q} \alpha_{2i} \Delta ln(hss)_{t-i} + \sum_{i=0}^{q} \alpha_{3i} \Delta ln(rppi)_{t-i} + \sum_{i=0}^{q} \alpha_{4i} \Delta Dcov_{t-i} + \beta_1 Y_{t-1} + \beta_2 ln(hss)_{t-i_{t-1}} + \beta_3 ln(rppi)_{t-1} + \beta_4 Dcov_{t-1} + e_t \quad (1)$$

$$\Delta Y_t = \alpha_0 + \sum_{i=0}^{p} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=0}^{q} \alpha_{2i} \Delta \ln (hss)_{t-i} + \sum_{i=0}^{q} \alpha_{3i} \Delta \ln (rppi)_{t-i} + \sum_{i=0}^{q} \alpha_{4i} \Delta Dcov_{t-i} + \delta ECT_{t-1} \quad (2)$$

In equation (1), Y_t is a dependent variable that shows the foundings and disbandings of joint-stock company (JSC), limited company (LC), cooperation company (KOOP) and total (TOT), respectively, while $Dcov_t$ is the dummy variable identifying the COVID-19 period, hss_t and $rppi_t$ are independent variables indicating HSS and the RPPI, respectively. The long-run relationship or the existence of cointegration between variables is inferred by testing the hypothesis of $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = 0$. In testing this hypothesis, Pesaran et al. (2001) used the critical values calculated for I(0) and I(1) instead of using Wald testing. If the calculated value of the F-statistic is more than the critical value for I(1) calculated at the confidence levels of 10%, 5% and 1%, the existence of cointegration between variables is accepted. For critical values calculated by Pesaran et al. (2001), the sample size is asymptotically 1000. But Narayan (2005) calculated new critical values for sample sizes ranging from 30 to 80 observations. Therefore, in this study with a sample of size n=48, Narayan's (2005) critical values were used, and when the problem of degenerated dependent variables was encountered, t-critical values were used.

Generally, if the dummy variables are included in the model, the non-zero components of the dummy variable should asymptotically disappear. Otherwise, the critical values obtained from the study of Pesaran et al. (2001) may be invalid. Nevertheless, the prediction has still been stable and valid. The variation caused by the existence of dummy variables should not exceed the variations of cointegrating relationships. In other words, the ratio of the period in which the dummy variables are not zero to the sample size should approach zero; otherwise, their critical values must be changed. This situation was clarified by footnote 17 in the study of Pesaran et al. (2001). Since in this study the ratio of the period in which the dummy variable is not zero to the sample size is 0.208, $Dcov_t$ was not added to the model as an exogenous variable in order to see the long- and short-run effects of the dummy variable. The short-run dynamics in the study are revealed by the Error Correction Model (ECM):

In equation 2, ECT_{t-1} is the error correction term; δ is the correction coefficient that shows how quickly a deviation from the long-run equilibrium between variables is adjusted. At the same time, the coefficient of δ expressing the percentage of disequilibrium of the current period shock converges back to the long-run equilibrium within the next period. The value of $1/|\delta|$ indicates the speed of adjustment to equilibrium following a shock. In other words, $1/|\delta|$ is the time to reach the long-run equilibrium.

4. Findings

The ARDL bounds testing results of the foundings and disbandings of companies in the construction sector were given in tables 1 to 10. Lagged values of ARDL models were determined according to the Akaike information criterion. For model residuals, heteroscedasticity, autocorrelation and normality were tested with the Breusch-Pagan-Godfrey (BPG) test, the Breusch-Godfrey (BG) test and the Jarque-Bera (JB) test, respectively. The Ramsey Reset (RR) test was applied to test the stability of model coefficients and the results are given in the tables. The diagnostic test results showed that there were no heteroscedasticity and autocorrelation problems in the model residuals. Furthermore, it was seen that the residuals were distributed normally and the model coefficients were found to be stable. The model coefficients were found unstable only in terms of the RR results of the disbandings of joint-stock and cooperative companies. According to the results of ARDL bounds testing, long-run equilibrium relationships existed between the dependent variable related with the foundings and disbandings and the variables of *hss*, *rppi* and D_{COV}, that is, the hypothesis stating that the variables are cointegrated was accepted at the confidence level of 5% for LTD foundings and 1% for the others. Cointegration was tested by comparing critical values and at the same time t-limit values, which are the test statistics of the lagged value of the dependent variable, with Narayan (2005).

Table 1 The ARDL bounds testing results for the foundings of joint-stock company

Model A1 - ARDL (2, 4, 3, 3)							
LRC - ln(JSC)				ECM - Δln(JSC)			
Variable	**Coefficient**	**t-stat**	**P**	**Variable**	**Coefficient**	**t-stat**	**P**
ln(hss)	1.47	4.94	0.00	C	15.90	6.37	0.00
ln(rppi)	-6.82	-8.48	0.00	Δln(JSC)(-1)	-0.29	-2.65	0.01
Dcov	1.41	5.45	0.00	Δln(hss)	0.20	1.58	0.13
				Δln(hss)(-1)	-0.83	-3.97	0.00
				Δln(hss)(-2)	-0.59	-4.66	0.00
				Δln(hss)(-3)	-0.30	-2.91	0.01
R-square	*0.90*			Δln(rppi)	19.17	3.43	0.00
Ad. R-square	*0.84*			Δln(rppi)(-1)	3.26	0.69	0.50
Model F-stat	*16.45*	*(0.000)*		Δln(rppi)(-2)	15.39	3.47	0.00
BPG	*0.55*	*(0.89).*		D(Dcov)	-0.07	-0.32	0.75
BG	*0.25*	*(0.78).*		D(Dcov(-1))	-2.25	-7.49	0.00
JB	*0.53*	*(0.76).*		D(Dcov(-2))	-2.51	-5.44	0.00
RR	*0.87*	*(0.39).*		ECT(-1)	-0.82	-6.41	0.00
Bounds test	*F-stat*	*9.28****	*abs t-stat*	*6.03****			

Source: Authors' own calculation

According to the results of Model A1 given in Table 1, a 1% increase in HSS increases in the long run the foundings of joint-stock companies statistically by 1.47%. In other words, the flexibility of the foundings of joint-stock companies according to HSS is 1.47. A 1% increase in the RPPI decreases the foundings of joint-stock companies by 6.82%. The COVID-19 pandemic has a positive effect of 1.41% on the foundings of joint-stock companies. When the ECM results are examined, it can be seen that the coefficient of the error correction term (ECT) is negative and statistically significant, and 82% of deviations from the long-run equilibrium are adjusted at the end of a period and also reach the equilibrium after 1.22 months.

Table 2 The ARDL bounds testing results for the foundings of limited companies

Model A2 - ARDL (2, 3, 3, 4)							
LRC - ln(LTD)				ECM - Δln(LTD)			
Variable	**Coefficient**	**t-stat**	**P**	**Variable**	**Coefficient**	**t-stat**	**P**
ln(hss)	1.00	3.41	0.00	C	8.49	4.42	0.00
ln(rppi)	-3.91	-4.26	0.00	Δln(ltd)(-1)	-0.26	-2.21	0.04
Dcov	0.78	2.37	0.02	Δln(hss)	0.05	0.47	0.65
				Δln(hss)(-1)	-0.35	-2.11	0.04
				Δln(hss)(-2)	-0.19	-1.73	0.10
				Δln(rppi)	13.88	2.84	0.01
R-square	*0.85*			Δln(rppi)(-1)	-5.28	-0.90	0.37
Ad. R-square	*0.77*			Δln(rppi)(-2)	14.57	3.41	0.00
Model F-stat	*10.69*	*(0.000).*		D(Dcov)	0.18	1.00	0.33
BPG	*1.15*	*(0.36).*		D(Dcov)(-1)	-1.39	-6.45	0.00
BG	*0.5*	*(0.61).*		D(Dcov)(-2))	-1.25	-3.25	0.00
JB	*2.46*	*(0.29).*		D(Dcov)(-3))	0.99	2.62	0.01
RR	*1.6*	*(0.12).*		ECT(-1)	-0.66	-4.44	0.00
Bounds test	*F-stat*	*4.81***	*abs t-stat*	*3.92***			

Source: Authors' own calculation

According to the results of Model A2, a 1% increase in HSS increases the foundings of limited companies by 1%. On the other hand, a 1% increase in the RPPI decreases the foundings of limited companies by 3.91%. Moreover, the COVID-19 period has a positive effect of 0.78% on the foundings of limited companies. A significant ECT shows that a deviation from the long-run equilibrium is adjusted 1.51 months later with a 66% adjustment rate.

Table 3 The ARDL bounds testing results for the foundings of cooperative companies

Model A3 - ARDL (1, 1, 0, 3)							
LRC - ln(COOP)				ECM - Δln(COOP)			
Variable	**Coefficient**	**t-stat**	**P**	**Variable**	**Coefficient**	**t-stat**	**P**
ln(hss)	0.54	3.67	0.00	C	-3.88	-7.42	0.00
ln(rppi)	0.22	0.41	0.68	Δln(hss)	0.33	3.40	0.00
Dcov	0.08	0.42	0.68	D(Dcov)	0.21	1.08	0.29
				D(Dcov(-1))	-0.37	-1.70	0.10
				D(Dcov(-2))	-0.56	-2.86	0.01
				ECT(-1)	-0.92	-7.46	0.00
R-square	*0.60*						
Ad. R-square	*0.51*						
Model F-stat	*6.78*	*(0.000).*					
BPG	*0.22*	*(0.98).*					
BG	*0.29*	*(0.75).*					
JB	*1.97*	*(0.37).*					
RR	*0.28*	*(0.59).*					
Bounds test	*F-stat*	*12.84****	*abs t-stat*	*7.02****			

Source: Authors' own calculation

According to the results of Model A3 given in Table 3, a 1% increase in HSS increases the foundings of cooperative companies by 0.54%. The RPPI and the COVID-19 period do not have a statistically significant effect on the foundings of cooperative companies. The ECT indicates a 92% deviation from long-run equilibrium that is adjusted at the end of a period and the equilibrium is reached after 1.08 months.

Table 4 The ARDL bounds testing results for the total foundings of companies

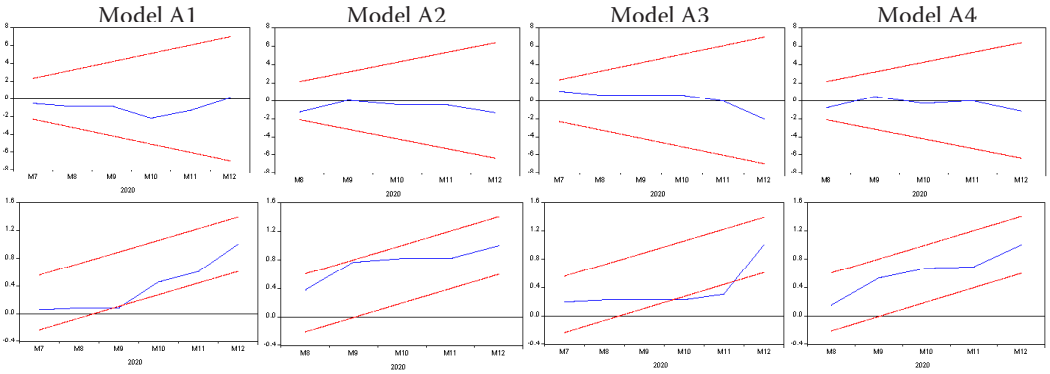
Model A4 - ARDL (2, 2, 4, 4)							
LRC - ln(TOT)				ECM - Δln(TOT)			
Variable	**Coefficient**	**t-stat**	**P**	**Variable**	**Coefficient**	**t-stat**	**P**
ln(hss)	1.07	2.93	0.01	C	7.30	4.30	0.00
ln(rppi)	-4.20	-3.90	0.00	Δln(TOT)	-0.36	-3.40	0.00
Dcov	0.93	2.44	0.02	Δln(hss)	0.04	0.38	0.71
				Δln(hss)(-1)	-0.24	-1.78	0.09
				Δln(rppi)	15.42	3.20	0.00
				Δln(rppi)(-1)	-8.21	-1.44	0.16
R-square	*0.87*			Δln(rppi)(-2)	14.76	3.46	0.00
Ad. R-square	*0.79*			Δln(rppi)(-3)	-6.52	-2.18	0.04
Model F-stat	*12.17*	*(0.000).*		D(Dcov)	0.28	1.63	0.11
BPG	*0.84*	*(0.63).*		D(Dcov(-1))	-1.40	-6.82	0.00
BG	*0.99*	*(0.38).*		D(Dcov(-2))	-1.26	-3.59	0.00
JB	*2.56*	*(0.28).*		D(Dcov(-3))	1.30	3.65	0.00
RR	*2.45*	*(0.13).*		ECT(-1)	-0.53	-4.33	0.00
Bounds test	*F-stat*	*4.23***	*abs t-stat*	*3..51****			

Source: Authors' own calculation

According to the results of Model A4 given in Table 4, a 1% increase in HSS increases the foundings of TOT by 1.07%. A 1% increase in the RPPI decreases the foundings of TOT by 4.2%. The COVID-19 period has a positive effect of 0.93% on the foundings of TOT. The long-run disequilibrium improves in 1.89 months according to the ECT.

It can be seen that the lagged values of the dummy variable, which shows the COVID-19 period, have a negative and statistically significant effect on the number of foundings of all company types. In other words, COVID-19 affects the future periods, not the instant period in the short run.

Table 5 CUSUM vs CUSUMSQ plots for foundings



Source: Authors' own calculation

The cumulative sum of consecutive error terms (CUSUM) test and the cumulative sum of squares of consecutive error terms (CUSUMSQ) test are model stability tests that give information on whether there is a break in the data set. The CUSUM test does not clearly inform which period has a structural break, but the CUSUMSQ test can detect this period. According to the graphs in Table 5, the CUSUM and CUSUMSQ values of the foundings of each model are at the confidence level of 5%, and it is observed that there is only a structural break in the founding of COOP that includes October and November 2020.

Table 6 The ARDL bounds testing results for the disbandings of joint-stock companies

Model B1 - ARDL (1, 0, 1, 0)							
LRC - ln(JSC)				**ECM - Δln(JSC)**			
Variable	**Coefficient**	**t-stat**	**P**	**Variable**	**Coefficient**	**t-stat**	**P**
ln(hss)	0.38	1.29	0.20	C	-14.89	-6.72	0.00
ln(rppi)	3.67	2.90	0.01	Δln(rppi)	-11.35	-2.12	0.04
Dcov	-0.63	-1.60	0.12	ECT(-1)	-0.81	-6.75	0.00
R-square	*0.38*						
Ad. R-square	*0.31*						
Model F-stat	*4.94*	*(0.000)*					
BPG	*0.55*	*(0.74).*					
BG	*0.24*	*(0.79).*					
JB	*0.62*	*(0.24).*					
RR	*3.51*	*(0.07).*					
Bounds test	*F-stat*	*10.61****	*abs t-stat*	*5.62****			

Source: Authors' own calculation

According to Model B1 results given in Table 6, a 1% increase in the RPPI increases in the long run the JSC disbanding by 3.67%. There is no significant effect of HSS and the COVID-19 period on the JSC disbanding. The long-run disequilibrium rebalancing rate is 81% according to the ECT and the equilibrium is reached after 1.23 months.

Table 7 The ARDL bounds testing results for the disbandings of limited companies

Model B2 - ARDL (1, 0, 0, 0)							
LRC - ln(LTD)				ECM - Δln(LTD)			
Variable	Coefficient	t-stat	P	Variable	Coefficient	t-stat	P
ln(hss)	0.75	2.60	0.01	C	-10.62	-6.56	0.00
ln(rppi)	2.27	1.83	0.07	ECT(-1)	-0.72	-6.57	0.00
Dcov	-0.46	-1.21	0.23				
R-square	*0.36*						
Ad. R-square	*0.31*						
Model F-stat	*10.87*	*(0.000*					
BPG	*1.73*	*(0.16).*					
BG	*0.22*	*(0.80).*					
JB	*2.88*	*(0.24).*					
RR	*0.88*	*(0.36).*					
Bounds test	*F-stat*	*10.07****	*abs t-stat*	*5.36****			

Source: Authors' own calculation

Model B2 results show that a 1% increase in HSS and the RPPI increases the disbandings of limited companies by 0.75% and 2.27%, respectively. According to the ECT, a deviation from the long-run equilibrium is adjusted 1.39 months later with a 39% adjustment speed.

Table 8 The ARDL bounds testing results for the disbandings of cooperative companies

Model B3 - ARDL (3, 3, 0, 3)							
LRC - ln(COOP)				ECM - Δln(COOP)			
Variable	Coefficient	t-stat	P	Variable	Coefficient	t-stat	P
ln(hss)	1.19	4.57	0.00	C	0.50	5.57	0.00
ln(rppi)	-2.13	-3.14	0.00	Δln(COOP)(-1)	0.81	5.00	0.00
Dcov	-0.63	-2.82	0.01	Δln(COOP)(-2)	0.51	3.55	0.00
				Δln(hss)	0.03	0.10	0.92
R-square	*0.80*			Δln(hss)(-1)	-1.92	-5.20	0.00
Ad. R-square	*0.73*			Δln(hss)(-2)	-1.43	-4.38	0.00
Model F-stat	*10.87*	*(0.000)*		ΔDcov	-0.26	-0.53	0.60
BPG	*1.12*	*(0.38).*		ΔDcov (-1)	0.63	1.07	0.29
BG	*0.65*	*(0.53).*		ΔDcov (-2)	-0.92	-1.77	0.09
JB	*1.96*	*(0.37).*		ECT(-1)	-2.14	-9.22	0.00
RR	*15.74*	*(0.00)*					
Bounds test	*F-stat*	*19.43****	*abs t-stat*	*8.37****			

Source: Authors' own calculation

In Table 8, it can be seen that a 1% increase in the RPPI decreases the disbandings by 2.13%. Likewise, the COVID-19 period decreases the disbandings by 0.63%. However, a 1% increase in HSS increased the disbandings of cooperative companies by 1.19%. Although the ECT coefficient is negative and statistically significant, it is does not have any meaning in terms of inference and interpretation because it is less than -1.

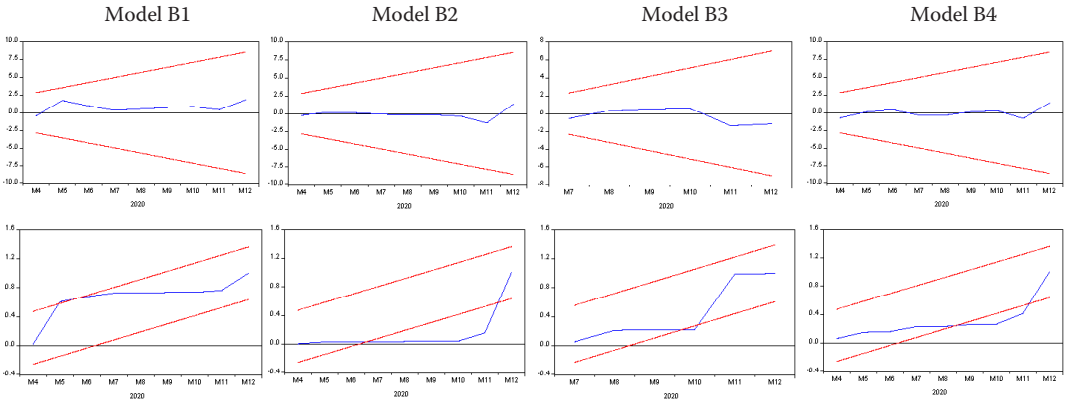
Table 9 The ARDL bounds testing results for the total disbandings of companies

Model B4 - ARDL (1, 1, 0, 0)							
LRC - ln(TOT)				ECM - Δln(TOT)			
Variable	Coefficient	t-stat	P	Variable	Coefficient	t-stat	P
ln(hss)	0.95	3.38	0	C	-10.02	-6.49	0
ln(rppi)	1.32	1.23	0.23	Δln(hss)	0.43	2.84	0.01
Dcov	-0.46	-1.41	0.17	ECT(-1)	-0.84	-6.5	0
R-square	*0.36*						
Ad. R-square	*0.29*						
Model F-stat	*4.78*	*(0.001)*					
BPG	*1.03*	*(0.41).*					
BG	*0.31*	*(0.73).*					
JB	*4.66*	*(0.10).*					
RR	*0.06*	*(0.81).*					
Bounds test	*F-stat*	*9.83****	*abs t-stat*	*5.65****			

Source: Authors' own calculation

When looking at the Model B4 outputs regarding total disbandings, a 1% increase that only occurs in HSS in the long run increases the total disbandings by 0.95%. According to the ECT coefficient, a deviation from the long-run equilibrium is adjusted after 1.19 months.

Table 10 CUSUM vs CUSUMSQ plots for disbandings



Source: Authors' own calculation

CUSUM graphs show that no structural break was detected, while in the graphs giving the CUSUMSQ test results, it can be seen that there is a structural break in the data set for LTD disbandings and total disbandings.

5. Conclusion

According to the findings obtained, HSS positively influences organizational foundings in all three organizational populations and the general organizational community of the construction sector. It must be mentioned that these are predicted results. On the other hand, a positive relationship was also found between HSS and organizational disbandings in populations other than joint-stock companies. It means that although HSS showed a tendency to increase, the disbandings in the populations of limited and cooperative companies also increased. It is anticipated that this situation may be due to the fact

that the companies that are under the NACE 2 code *Construction* operate in the field of the "*Construction of non-building structures*" such as highways and railways, airports, bridges, tunnels, transmission and storage facilities. At this point, an insignificant relationship between HSS and disbandings of joint-stock company populations, which can be defined as a *large-scaled and generalist organizational population* (Carroll & Hannan, 1995), and therefore may deal with large-scaled infrastructure constructions other than building constructions, strengthens our prediction.

The findings revealed that there is a long-run and negative relationship between the RPPI and the foundings of organizational populations except the cooperatives. The findings also showed that the relations between the RPPI and organizational disbandings in joint-stock and limited populations are long run and positive, while its relationship with cooperative disbandings is negative. It was also found that the relationship between the RPPI and disbandings in the organizational community of the construction sector (total) is statistically insignificant. With reference to these findings, even though the RPPI increases, the numbers of the organizational foundings decrease in joint-stock and limited populations and generally in the construction organizational community. As supported by empirical studies in the literature, it is thought that a negative relationship between the house price index and home sales statistics and housing demand may be effective in this respect. Likewise, it can be said that a long-run positive relationship obtained with disbandings in the joint-stock and limited organizational populations is a reflection of this situation. On the other hand, a negative relationship between the RPPI and disbandings in the cooperative populations can be evaluated as an expected result since the cooperatives are organizations established on the basis of association to protect the interests of shareholders rather than to gain profit. Indeed, it should be perceived as normal that the numbers of disbandings in the cooperatives established by individuals who want to protect and improve their interests decrease with an increase in house prices.

The findings show that the effect of the COVID-19 period is positive on the organizational foundings in the populations other than a cooperative population, and statistically insignificant on the organizational disbandings. In other words, the findings indicate that although the COVID-19 pandemic is a dramatic process impossible to anticipate, it could not adversely affect organizational foundings in the construction sector that has continued to grow steadily for many years in Turkey. The disbanding of fewer cooperative organizations during the COVID-19 period is also seen as an expected result, as these are organizations established by individuals who want to protect their interests and have a house despite the uncertainties experienced.

When short-run relationships between the variables are examined, the ECM results indicate that deviations from the long run existing between the numbers of foundings and disbandings and house sale statistics, the RPPI and the COVID-19 period, were adjusted within a period between one and two months. Only the adjustment speed for cooperative disbandings could not be interpreted, even though it is statistically significant and negative. This situation shows that the price and demand-driven deviations in the construction sector during the COVID-19 process do not affect the long-run equilibrium. However, when the CUSUMSQ results are taken into account, it can be seen that structural breaks occurred in the second half of 2020, especially in the last quarter. It is thought that this situation may have arisen due to the fact that the sector-supportive regulations of the state, such as the policy of implementing low interest rates for buying a house in the second half of 2020, were completed by the end of the third quarter of 2020. Additionally, the findings obtained indicate that by the second half of the year, the effect of seasonality may appear depending on loosening the restrictions in both Turkey and all over the world. Thus, this is considered to be a valuable output in terms of its potential to form a basis for future studies.

Within the framework of organizational ecology theory, i.e. a theoretical perspective that has not received enough attention in Europe and Turkey, the results of our study focusing on the Turkish construction sector, in which its relationship with the economy in terms of organizational founding and disbanding in the sector have not been adequately examined, are expected to contribute to both business economics and organizational theory literature, studies on the construction sector, knowledge of the evaluation of socioeconomic effects of the COVID-19 pandemic and future studies.

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Appendix A

Table A1 Descriptive statistics of variables

	ln(hss)	ln(rppi)	$ln(JSC)_f$	$ln(LTD)_f$	$ln(COOP)_f$	$ln(TOT)_f$	$ln(JSC)_d$	$ln(LTD)_d$	$ln(COOP)_d$	$ln(TOT)_d$
Mean	11.63	4.73	4.71	6.55	3.83	6.75	3.09	4.67	3.78	5.20
Median	11.65	4.69	4.77	6.62	3.86	6.83	3.07	4.64	3.90	5.16
Max.	12.34	5.04	5.49	7.03	4.55	7.19	4.19	5.74	5.16	6.06
Min.	10.66	4.56	3.30	5.56	2.94	5.74	2.20	3.85	0.69	4.20
Std. Dev.	0.30	0.13	0.49	0.35	0.28	0.36	0.48	0.44	0.90	0.44
Skewness	-0.72	1.01	-0.67	-0.72	-0.64	-0.78	0.12	0.39	-1.55	0.22
Kurtosis	5.17	3.01	3.43	2.87	4.55	3.02	2.81	2.55	5.97	2.78

Table A2 The output of Philips-Perron (PP) and Augmented Dickey-Fuller (ADF) unit root tests

At Level		**ln(hss)**	**ln(rppi)**	**$ln(JSC)_f$**	**$ln(LTD)_f$**	**$ln(COOP)_f$**	**$ln(TOT)_f$**	**$ln(JSC)_d$**	**$ln(LTD)_d$**	**$ln(COOP)_d$**	**$ln(TOT)_d$**
PP	t-stat	-4.09	0.50	-0.38	-0.31	-0.19	-0.32	-0.27	0.08	-1.22	-0.21
	p	0.01	0.99	0.54	0.57	0.61	0.56	0.58	0.70	0.20	0.60
ADF	t-stat	-4.64	-1.66	-0.39	-0.28	0.57	-0.26	0.34	0.43	-1.08	0.18
	p	0.0027	0.7455	0.54	0.58	0.84	0.59	0.78	0.80	0.25	0.73
First Difference		**Δln(hss)**	**Δln(rppi)**	**$\Delta ln(JSC)_f$**	**$ln(LTD)_f$**	**$\Delta ln(COOP)_f$**	**$\Delta ln(TOT)_f$**	**$\Delta ln(JSC)_d$**	**$ln(LTD)_d$**	**$\Delta ln(COOP)_d$**	**$\Delta ln(TOT)_d$**
PP	t-stat	-12.35	-4.459	-9.96	-11.21	-24.59	-10.86	-9.67	-9.30	-13.00	-10.50
	p	0	0.005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ADF	t-stat	-4.60	-4.50	-6.52	-6.53	-5.71	-6.49	-5.01	-4.82	-6.36	-4.60
	p	0.004	0.004	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Authors' own calculation

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INVESTING IN CHP PLANTS: ESTIMATING EXTERNAL COSTS AND BENEFITS

Abstract

Purpose: The purpose of this paper is to identify and evaluate the environmental impacts and estimate the external costs and benefits of building and operating a combined heat and power (CHP) plant. This research will contribute to the scientific literature in the field of public capital investments in CHP plants and facilitate the evaluation of similar assessments and studies by identifying relevant factors that affect society and the environment.

Methodology: The ExternE methodology and Impact Pathway Approach (IPA) were used to estimate the externalities of building and operating the plant. The ExternE methodology considers environmental impacts, global warming impacts and accidents, and it is widely accepted in the estimation of externalities of CHP plants.

Results: The main external benefits refer to the savings from the reduction of CO2 emissions per unit of energy produced, savings from the reduction of energy losses in the transmission of electricity, reduction of Croatia's dependence on electricity imports, improvement of the balance of payments, and fiscal benefits. The main external costs arise from Croatia's increasing import dependence on natural gas and changes in the use of agricultural land.

Conclusion: It is estimated that the external benefits are higher than the external costs. In addition to the estimation of external costs, their internalization is done through various taxes and fees, thus affecting the unit cost of electricity. Further research should extend the estimation of external benefits and costs to consider broader social impacts and conduct a full cost-benefit analysis.

Keywords: CHP plants, cost-benefit analysis, external costs, external benefits, green accounting

1. *Introduction*

In 2019, the European Union (EU) introduced the Clean Energy for all Europeans package (EC, 2019a). Alongside Energy Union (EC, 2015), which provides a framework for ensuring energy security, sustainability and affordability, the Clean Energy package includes key measures to enable the energy transition and make the EU carbon neutral by 2050.

According to COGEN Europe (2020), highly efficient combined heat and power (CHP) plants could provide a solution to achieve carbon neutrality. Indeed, energy efficiency is the pathway to significant

reductions in greenhouse gas (GHG) emissions. CHP plants, also known as cogeneration, include simultaneous production of electricity and thermal energy. COGEN Europe (2020) stresses that CHP plants "can be optimised to maximise system energy/resource efficiency and flexibility" (p. 38). Besides the fact that they can achieve 90% energy efficiency (EC, 2014a), these plants bring numerous benefits to the EU; they reduce annual system costs by about €4-8 billion, lead to primary energy savings of 154-221 TWh and reduce CO2 emissions by about 3.8-5.5 million tonnes (COGEN Europe, 2020).

In this context, EU countries are required to carry out a cost-benefit analysis of the potential of using cogeneration for investments in plants with heat or electrical thermal input higher than 20 MW, in industrial plants producing waste heat with thermal input over 20 MW, and in a district heating and cooling network exceeding a total thermal input of 20 MW (EC, 2012). In terms of promoting energy efficiency, the cost-benefit analysis should provide an assessment „to establish the most cost-effective and beneficial heating or cooling option for a given geographical area for the purpose of heat planning" (EC, 2012).

When conducting a cost-benefit analysis, environmental and health impacts must be considered and externalities must be included (ExternE, 2005). The estimation of external costs and benefits, and consequently their internalisation, is one of the most important issues in energy investment projects. Externality can be defined as „any cost or benefit that spills over from the project towards other parties without monetary compensation" (EC, 2014b). Therefore, the purpose of this paper is to identify and evaluate the environmental impacts and estimate the external costs and benefits in the construction and operation of a natural gas-fired CHP plant in Croatia. In addition to electricity generation, this plant will also produce process steam and district heating for the city. Although natural gas is a fossil fuel, the GHG emissions of this energy source are significantly lower than those of coal or oil and when combusted in a highly efficient cogeneration plant, it can be considered a clean energy source. This research will contribute to the scientific literature in the field of public capital investments in CHP plants and facilitate the evaluation of similar assessments and studies by identifying relevant factors that affect society and the environment.

This paper is organized as follows. After the introductory section, the second section presents the problem of estimating externalities in the European context. In the third section, the methodology used is described, followed by a section on the environmental impact evaluation and estimation of external benefits and costs for a CHP plant. Finally, conclusions and recommendations for further research are given.

2. Estimating externalities in the European context

In 2005, the European Commission developed the ExternE (Externalities of Energy) project intending to assess the external costs of energy. The ExternE methodology (EC, 2005), based on the Impact Pathway Approach, has gained wide recognition in the scientific community for estimating the external costs of energy production. The following is an overview of the main papers in this field based on the ExternE methodology for European energy production.

Bozicevic Vrhovcak et al. (2005) calculated the external costs related to the environmental impact of thermal power plants on human health in Croatia for the year 2000. The power plants studied were differentiated by installed capacity, electricity generation, fuel, and location. The results showed that the average cost per unit of energy generated was US$ 3 million/kWh and that external costs depend largely on power plant emissions and plant location. Likewise, Georgakellos (2010) analysed the environmental externalities in thermal power plants in Greece for the period 2003-2004. He compared the impact of the internalisation of these externalities on electricity generation costs for different energy sources and found that external costs are particularly high for lignite-fired power plants. Streimikiene et al. (2009) studied the external costs of electricity in the Baltic States and reported that the highest external costs were in the Estonian electricity sector as it was based on oil shale, while the lowest external costs were recorded in the Lithuanian electricity sector.

These studies show that fossil fuels have high external environmental costs. External costs also affect unit electricity costs, as demonstrated by Czarnowska and Frangopoulos (2012). They assessed the environmental external costs of a pulverised coal power plant in Poland and concluded that these

costs have a significant impact on unit electricity costs, increasing them by about 566% for a variation of plant with no abatement equipment and by about 70% for a plant with abatement equipment. Likewise, Streimikiene (2021) analysed the external costs of electricity generation in the Visegrad countries (Czech Republic, Slovakia, Poland, Hungary). The results showed that Poland has the highest weighted average external costs of electricity generation due to the high share of coal in electricity generation. Poland and Hungary recorded decreasing external costs during 2010-2018 due to the increasing share of renewables in their electricity generation structure, while external costs in the Czech Republic and Slovakia remained stable.

In contrast to fossil fuels, the external environmental costs of renewable energy are significantly lower. Patrizio et al. (2017) studied the environmental impacts of biogas-based technologies in Italy. Their results showed that the external costs of biogas-based technologies are lower than those of fossil fuel-based technologies. Streimikiene and Alisauskaite-Seskiene (2014) estimated the external costs of electricity generation in Lithuania for the period 2010-2030 and found that, as expected, renewables have the lowest external costs. More specifically, hydropower and wind power have the lowest external costs, followed by solar power. Rabl and Rabl (2013) compared the external costs of nuclear power with those of wind power and concluded that shutting down nuclear power plants and replacing them with wind power would have high private costs that would not be compensated by lower external costs. Zerrahn (2017) conducted a literature review to examine the external costs of wind power generation, which is generally used to mitigate the external costs of conventional power plants. He found that wind energy also has external costs and affects people's quality of life, mainly due to noise. In addition, it can have a negative impact on the employment and security of the energy supply.

Electricity generation from renewable energy sources, especially solar and wind power, results in intermittent energy supply. An unreliable power supply can pose a risk to the business, safety, and health (EPA, 2021). Therefore, renewable energy sources often require baseload capacity to support them. Potential capacities include highly efficient natural gas power plants. Although natural gas is a fossil fuel, it can be considered a clean energy source due to its lower greenhouse gas emissions compared to coal or oil, as noted by Yang et al. (2017). According to IEA (2017), natural gas generates 40% less CO2 emissions per unit of energy output when compared to coal. A study by Rabl and Spadaro (2016) makes a strong case for natural gas as a clean(er) energy source. They analysed the costs of environmental damage in Europe and found that the damage costs for fossil fuels are significantly higher than those for renewables. However, the highest costs are for coal, oil and lignite, while natural gas is cleaner, and damage costs are between those of coal and renewables. Therefore, high-efficiency natural gas power plants could be considered as baseload capacity for energy transition (for more details see Pekanov Starcevic et al., 2021) and are used as a case study in this paper.

3. Methodology

This research followed the ExternE methodology for assessing the externalities of electricity production. The methodology covers externalities by considering environmental impacts, global warming impacts, and accidents. It is widely accepted in the assessment of external costs of CHP plants (see Fahlén & Ahlgren, 2010; Streimikiene & Alisauskaite-Seskiene, 2014; Jorli et al., 2018) and consists of five stages, as described in ExternE (EC, 2005, p. 1):

1. "Definition of the activity to be assessed and the background scenario where the activity is embedded. Definition of the important impact categories and externalities.
2. Estimation of the impacts or effects of the activity (in physical units). In general, the impacts allocated to the activity are the difference between the impacts of the scenario with and the scenario without the activity.
3. Monetisation of the impacts, leading to external costs.
4. Assessment of uncertainties, sensitivity analysis.
5. Analysis of the results, drawing of conclusions."

In addition, the Impact Pathway Approach (IPA) was used. This approach is carried out in several stages. The specification of emissions from the source is followed by the estimation of impacts in

physical units and further conversion of these impacts into monetary values (EC, 2005).

The case study used in the paper refers to the high-efficiency CHP plant that generates 500 MW of electricity, 160 MW of district heating, and up to 40 t/h of process steam. The efficiency of the power plant is reported to be 63.3% (for more details, see Borozan and Pekanov Starcevic, 2015). The estimated electricity price is €60/MWh, which is the monthly baseload electricity price in Central Eastern Europe in 2018 (EC, 2019b). The estimated natural gas price is €25/MWh, as the average European natural gas hub price in the fourth quarter of 2018 (EC, 2019c), and the CO2 emission quota €25/tCO2, as the price at the end of 2018 (Trading Economics, 2021).

4. Estimation of the external benefits and costs resulting from the construction and operation of a CHP plant

External benefits are any effects of the project that increase the economic (social) potential of a unit of local self-government, a region, or a state. External costs, on the other hand, are the effects of the project that have a negative impact on society. This section estimates the external benefits and costs that construction and operation bring to society, including its environment.

4.1 External benefits

The external benefits generated during the construction and operation of the CHP plant are manifested in the form of savings (reduction of CO2 emissions per unit of energy produced and energy losses during transmission to the grid area), reduction of Croatia's dependence on electricity imports, and in the form of fiscal benefits (increase in revenues for the state budget and local budgets).

1. **Savings from lower CO2 emissions per unit of energy produced.** The external benefit of the construction and operation of the CHP plant are the savings resulting from the reduction of CO2 emissions per unit of energy produced. Gas-fired cogeneration plants significantly reduce greenhouse gas emissions, primarily CO2 (IEA, 2017). In addition, natural gas is the cleanest form of energy among fossil fuels.

   The benefits of natural gas-fired CHP power plants include (EPA, 2021):

   - higher overall efficiency compared to conventional generation,
   - avoided transmission and distribution losses,
   - environmental benefits of reduced fuel consumption and avoided transmission and distribution losses,
   - economic benefits such as lower energy costs and avoided capital costs,
   - reliability benefits.

   Moreover, CHP power plants achieve an overall efficiency of 60 to 80 percent, while conventional technologies reach 50 percent (EPA, 2021). The existing power plant, which is to be replaced by the new CHP plant, annually generates 115,000 MWh of electricity. It emits between 0.6 and 0.7 tCO2/MWh. The new high-efficiency CHP unit will emit about 0.35 tCO2/MWhe. Considering the stated difference of about 0.3 tCO2/MWhe, and an estimated emission price of €25/tCO2, we can talk about the savings of **€862,500.00** per year resulting from the reduction of CO2 emissions per unit of energy produced.

2. **Savings in the reduction of energy losses in the transmission of the electricity required for the city transmission area.** The electricity consumption needs of the transmission area amount to about 2,300 GWh per year. The existing production units cover only about 5-5.5% of the demand. The rest of the demand is covered through a high voltage network (110 kV). Technical losses of the transmission system operator amount to 2.16% and losses in the transmission area network amount to 1.17%. A difference of 1% means savings due to the reduction of energy losses in transmission. If the estimated electricity price is 60 €/MWH_{el}, we can talk about the savings of **€1,297,890.00** per year.[1]

3. **Reducing Croatia's dependence on electricity imports from abroad and improving the balance of payments by reducing foreign exchange outflows.** Statistical data of the Ministry of Environment and Energy of the Republic of Croatia (2019) show that:

1 [(2,300,000 – 115,000) x (2.16% - 1.17%)] x 60 €/MWHel = 1,297,890 €

- Primary energy self-supply in Croatia in 2018 was 54.1%, while energy imports amounted to 317.79 PJ,
- In 2013-2018, energy imports in Croatia increased on average by 3.3% annually, with electricity imports increasing on average by 1.6% annually.
  In that sense, Croatia's energy dependence was 56.22% in 2018 (Eurostat, 2021). Looking at Croatia's position in the wider environment, we find that its import dependence in 2018 is slightly below the EU-27 average (60.70%) (Eurostat, 2021). Countries in the immediate neighbourhood, such as Slovenia, Hungary, and Italy, are also import-dependent. For example, the energy import dependence in 2018 was 58.12% for Hungary, 51.21% for Slovenia, and 76.34% for Italy.

  The CHP plant will generate an average of 3,300 GWh of electricity annually, which, compared to the average annual consumption of transmission area (2,300 GWh), means that about 1,000 GWh per year can be fed into the Croatian electricity grid and possibly abroad and results in the savings of **€60,000,000.00** per year.

4. **Fiscal benefits**. Fiscal benefits arise, on the one hand, from an increase in the revenue side of the (state and local) budget through the collection of various taxes and, on the other hand, from a reduction in the expenditure side (e.g., through a reduction in the total amount of unemployment benefits). Tax revenues, contributions for compulsory insurance, revenues from assets, revenues from fees and charges, and other revenues constitute the revenues from the operation of the state budget.

   The construction and operation of the CHP plant will increase the revenue side of the state budget in the first year of the project by **€8.23 million** as follows:

   - profit tax (**€3.8 million**),
   - VAT (**€4.3 million**),
   - tax on employees' salaries (**€0.13 million**).

4.2 Identification of environmental impacts and estimation of external costs

According to ExternE (EC, 2005), one of the purposes of using external costs is to identify health and environmental impacts, i.e. environmental (green) accounting. Companies not only consider the impact of externalities caused by their activities, but these are also becoming visible in their financial reports, as noted by Hartwig et al. (2019).

4.2.1 Identification of environmental impacts

The following is a brief summary of the impact of the project on environmental components, to provide a general insight into the external costs that will be generated by the construction and operation of the CHP plant. The external energy costs are not included in the price, but society still has to take them into account.

1. **Air**. During the preparation and construction of the project, increased air pollution from exhaust gases from construction equipment used for this purpose, as well as increased dust due to the movement of motorized vehicles and work during construction, can be expected. However, it is expected that exhaust emissions will not exceed the permissible levels, as only the mechanization that meets all the requirements of technical control may be used, and as for dust, its range is not particularly large. Moreover, the construction period is limited, so the harmful effects of construction work on the air are estimated to be short term.

   During the operation of the CHP plant, emissions are produced into the air, which gets polluted. These emissions are partly regulated by law, and the costs incurred by the investor in the process represent internalized costs. These are primarily the purchase of an emission quota for carbon dioxide and fees for the emission of nitrogen oxides, expressed as nitrogen dioxide (NO2).

   Combined heat and power plants increase fuel efficiency by replacing the separate generation of electricity and heat with a single plant that produces both forms of energy. Since less fuel is needed to produce the same amount of energy, emissions of CO2, NOx and SOx (air pollution) are lower. The CHP plant uses natural gas as fuel, so emissions of SOx, volatile organic compounds (VOC), PM10 and dust are negligible.

2. **Land and water.** The spatial planning documents of the city and county in which the

investment is to be made allow the construction of infrastructure systems in addition to the existing power plant. The planned area is not fully owned by the investor, so privately owned land will be acquired. The use of some plots will be changed, and the natural surface cover and soil layer will be removed. Facilities, road infrastructure and manipulation areas will be built on part of the land, while the remaining part of the land will be covered with natural vegetation. If the usual protective measures are followed, no significant adverse impacts on the surrounding soil are expected during the construction phase. However, increased negative impacts on water (groundwater and surface water) are possible. Indeed, during the construction works, accidents may occur, contaminating the soil with various liquids (e.g., machine oils, fuels, etc.). Since the soil of the construction area is permeable to a significant degree, there is a possibility of groundwater contamination that may reach the nearby river. However, with proper implementation of protective measures, the risk of the project impacting water during construction is acceptable. Temporary and relatively weak impacts of pollution of the river are possible during the construction of pumping stations and accidents.

Negative impacts are also possible during the operation of the plant due to the increased temperature of the water discharged into the river. The impact of the operation of the CHP plant on water results from the use of water for cooling the power plant and its return to the river as well as from the use of water to supply the demineralization plant.

In addition, the plant will generate wastewater during its operations. Wastewater treatment is required by law; higher water pollution would result from accidents.

3. **Natural habitat, flora and fauna.** As the CHP plant will be largely located in the industrial zone, its operation will not have a significantly different impact on the conservation objectives and integrity of the ecological network and protected areas, and thus on the surrounding flora and fauna and habitat types if the usual safety measures are taken. The area where most of the work will take place is mostly agricultural land with a somewhat less mixed habitat. It is a habitat that is not of great importance from a nature conservation and biodiversity point of view.

   However, a limited impact is possible due to the construction of a pumping station. Adverse impacts on habitat (terrestrial and aquatic) and some songbirds, small mammals, as well as amphibians and reptiles inhabiting this habitat, are expected. Adverse impacts will result from habitat destruction, noise generated during construction, and pollution that will occur.

4. **Landscape.** The construction will affect the surface cover of the land. In addition, new infrastructure facilities and new industrial and administrative facilities (e.g., engine room, office building, etc.) will be constructed. Therefore, there will be significant changes to the landscape. However, the location of the proposed project is mainly in the part of the city where three landscape types meet: residential, industrial and agricultural areas. Since each of these areas is under direct human influence and there is already a power plant at the project site, the structure of the surrounding area will not be drastically affected.

4.2.2 Identification of other impacts

The impact of the project is evident both in the population and the economy.

1. **Population.** It is estimated that there will be approximately 1,800 people, mostly local residents, during the construction phase of the new facility and 32 newly employed permanent employees during the operational phase. Therefore, the project is not expected to have a significant negative impact on the natural and mechanical movement of the city's population and its demographic structure. However, traffic on the access roads is expected to increase during the construction phase, which in turn will increase the likelihood of traffic accidents. Moreover, there is a residential area on the southern edge of the land intended for future infrastructure systems, and the preparation of plans and project documentation must consider the systems of protection against noise and harmful emissions.

   During construction, the nearest residences will be adversely affected by increased dust

and exhaust emissions from construction equipment and vehicles, increased noise and ground vibration levels, and traffic intensity. However, these adverse effects will be short-lived.

Beneficial effects will be achieved through the creation of new jobs during construction and the increase in the standard of living and purchasing power of the new employees and the local population in general.

2. **Economy.** A positive impact on the economy of the city and its dynamization through new investments is expected. This will have a multiplier effect on other sectors of the economy (e.g., construction, transport, and various service sectors). There will be a positive impact on the budget of local self-government units due to various fees that they will collect (e.g. the land use fee for power plants).

   The land to be acquired, which is used for agricultural activities, will no longer be used for agricultural production as it will become the property of the investor. Therefore, this conversion will generate external costs, i.e. costs for the change of agricultural land use.

3. **Waste**. During construction, various types of solid waste (e.g., glass, plastic, packaging, waste oil, etc.) will be generated, which may have a negative impact on the environment if not disposed of in the prescribed manner. The contractor is responsible for the disposal of this waste.

   The plant will use only natural gas. Apart from the fact that its use will bring economic benefits to the investor, it will also result in less pollution and damage to the environment, as it is the cleanest fossil fuel that is increasingly used for such purposes.

4.2.3 Estimation of external costs

The construction and operation of the CHP power plant will incur costs that will burden the environment and its components and have an adverse impact on human health, the economy, and society. These are primarily the costs associated with Croatia's increased dependence on imports of natural gas and the costs associated with the change of agricultural land use.

1. **Increasing Croatia's import dependence on natural gas.** Compared to the existing power plant, the new CHP plant will increase natural gas consumption. It is estimated that consumption will increase by more than 11 times. The new power plant will consume about 600 million m3 of natural gas per year, while the existing power plant consumed about 54 million m3 of gas. Considering the current situation and the estimates given by the competent authorities for the share of domestic gas production in 2030, this means an average annual increase in import dependence of 291,564,000 m3 per year.

   Assuming a gas price of 25 €/MWh, i.e. 0.232 €/m3 gas, this ultimately means an increase of **€67,642,848.00** per year.

2. **The change of agricultural land use.** The change of land use results in a loss of value of the agricultural crops grown on that land. In other words, the yield obtained from this land is lost. Out of an area of approximately 175,000 m2 (intended for the construction of facilities, switchyards, and access roads), approximately 138,000 m2 is agricultural land, the use of which will be permanently changed.

   The area on the banks of the nearby river (approx. 10,250 m2) will also change permanently due to the construction of a pumping station.

   The temporary change (possibility of returning the land to a condition close to its original state) will affect the part of the land where the laying of the cooling water pipeline will take place, which is an area of approximately 45,000 m2.

   It should be noted that in the spatial planning documents the entire project area is designated as a construction area. If we add the fact that the analysis revealed soil contamination in the area designated for the construction of the plant, the conversion can be considered a positive step, as contaminated agricultural land will be excluded from the food production system. It is estimated that the cost of agricultural land use change amounts to 0.1 €/m^2 and the total cost of the change of agricultural land use is **€13,800.00**.

It is estimated that the external benefits (€70,390,390.00) exceed the external costs (€67,656,648.00) by €2,733,742.00. Apart from the estimation of external costs, their internalization is done through various taxes and fees, which affect the unit cost of electricity. In addition, Kudelko (2006) concluded in his study that the internalisation of external costs in the energy sector can significantly increase social welfare.

5. Conclusion

As the European Union seeks to achieve energy security, sustainability and affordability, investment in energy efficiency is encouraged. In this sense, when investing in power plants, EU countries must carry out a cost-benefit analysis to assess the potential of using cogeneration. In the context of a cost-benefit analysis, a particular emphasis should be placed on the identification of environmental and health impacts and the evaluation of external benefits and costs.

In this paper, an example of a high-efficiency CHP plant was used as a case study. Based on the ExternE methodology and Impact Pathway Approach, the environmental impacts, external benefits and costs of construction, and operation of the CHP plant were evaluated. The analysis showed that the main external benefits include savings from the reduction of CO2 emissions per unit of energy produced, savings from the reduction of energy losses in the transmission of electricity required in the city transmission area, reduction of Croatia's dependence on electricity imports from abroad, improvement of the balance of payments through the reduction of foreign exchange outflows, and fiscal benefits. As regards the environmental impact of the project, this is primarily in terms of the impact on air, soil, water, the natural habitat, flora and fauna, and the landscape. In addition, the project has an impact on the population and the economy. The main external costs arise from Croatia's increasing import dependence on natural gas and changes in the use of agricultural land. It is estimated that external benefits exceed external costs by €2,733,742.00.

For future research, it would be interesting to extend the estimation of external benefits and costs to consider broader social impacts and to conduct a full cost-benefit analysis, which is also the main limitation of the analysis performed in this paper. Such an extended analysis would give a more comprehensive insight into the full social impact of investments in a CHP plant.

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GENERATION Z BUYING BEHAVIOR CHANGE IN THE COVID-19 PANDEMIC CONTEXT

Abstract

Purpose: The purpose of this research is to analyze the changes in Croatian Generation Z buying behavior due to the COVID-19 pandemic. As a result of the pandemic, all governments have imposed different measures that directly and indirectly impact consumer behavior. Recent studies have mostly recorded a dynamic increase in online shopping, stockpiling, and change in priorities from luxury to basic goods. This study will specifically look into the relation between Generation Z buying behavior change and their exposure to the COVID-19 pandemic as well as its impact on their perception of the quality of life.

Methodology: A sample of 442 Generation Z respondents from Croatia was analyzed using ANOVA to identify buying behavior changes concerning the level of their exposure to COVID-19. The analysis also included a potential correlation between buyer behavior change and their perception of the quality of life.

Results: The statistical analysis has confirmed the increase of online shopping and stockpiling in the group of respondents who were exposed to self-isolation and those who have not been exposed to COVID-19, but there was no correlation with their perception of the quality of life change as a result of forced buying behavior change.

Conclusion: Generation Z is identified as an e-generation, born and brought up in a digital environment. Although the pandemic has forced them to switch even more to online shopping, they do not perceive the exposure to the COVID-19 pandemic to impact their quality of life.

Keywords: Generation Z, COVID-19, buying behavior, quality of life, Croatia

1. Introduction

Consumer behavior changes are often the result of positive or negative externalities. The most significant contemporary negative externality is the COVID-19 pandemic. To control the pandemic, most governments have imposed different measures that directly and indirectly impact consumer behavior. Moreover, consumers themselves are changing their attitudes, priorities, opinions and behaviors due to the pandemic and related health concerns. Several studies (Laato et al., 2020; Hall et al., 2021; Donthu & Gustafsson, 2020; Kirk & Rifkin, 2020) have already confirmed the changes in consumer behavior that are related to the COVID-19 pandemic. Most of these changes are reflected in

a dynamic increase of online compared to physical shopping (Ali, 2020; Mason et al., 2020; Donthu & Gustafsson, 2020) and in the change in priorities from luxury to basic products (Kirk & Rifkin, 2020; Aksoy & Ergen, 2020).

The aim of this study is to get an insight into the changes in the Croatian Generation Z consumer behavior due to the COVID-19 pandemic. Some studies have recognized the generational differences in perception of life and consumer behavior related to the COVID-19 pandemic (Life with Corona Network, 2020; Masters et al., 2020). There is a perception that a large swath of millennials and Generation Z are not heeding the public health cry of concern. Some young people seem to be continuing to live life as normal (Gharzai et al., 2020; Baus, 2021).

Generation Z, the students of today, is already identified as an e-generation born and brought up in a digital environment. As they were born with technology, they are connected with others through technology at all times and they have FOMO, or the "fear of missing out" (Chareewan et al., 2020). According to Hope (2016) Generation Z is realistic, social change-oriented, and self-confident. They rely on and believe in online information accuracy. In terms of buying behavior, Generation Z is a generation that craves immediate action, is impatient and moves without much hesitation from one offering to another (Bencsik et al., 2016).

This study looks more specifically into the relation between the behavior change of the Croatian Generation Z with respect to their exposure to the COVID-19 pandemic (no exposure, light exposure, heavy exposure) and their perceptions on its impact on their quality of life.

2. Literature overview and hypothesis development

Times of crisis, like the COVID-19 pandemic, create changes in many aspects of human life. From a behavioral perspective, the pandemic can be viewed as a collective action problem in which the success of the group – a region, a country, or the whole of humanity – depends on individual actions (Brañas-Garza et al., 2020). Some authors (Mason et al., 2020) identify the COVID-19 pandemic as an economic catalyst capable of altering the economy as well as consumer behaviors. Generally, it is possible to summarize the consumers' purchasing behaviors in times of crisis as follows (Hayta, 2012, p. 20):

- decrease in total consumption and wastefulness,
- extended information research on products,
- substitution with cheaper brands,
- buying local products rather than foreign brands,
- preference of informative ads over visual ads,
- intense interest in discounted stores and promotional goods.

Some authors (Agarwal & Singh, 2021) add the simplification of demand patterns due to limited offerings and discounts during the pandemic. A study by Nicomedes and Avila (2020) has shown that symptoms of hypochondriasis increase as people get in closer proximity with COVID-19 patients. It can be assumed that hypochondriasis will also influence consumer behavior – the study has identified the avoidance of crowded places (like shops) and social activities in general, increased consumption of hygiene and disinfection products as well as canned and durable food products.

A study of US consumers (Mason et al., 2020) suggests that the COVID-19 pandemic has altered consumers' product needs, shopping behaviors, purchasing behaviors as well as their post-purchase satisfaction levels: consumers are avoiding publicly consumed products and have increased their virtual shopping and online purchasing behaviors. Consumers satisfaction levels have decreased and it is more difficult for marketers to gain customer loyalty.

Therefore, the following hypothesis has been developed:

> *H1: There is a statistically significant difference between consumer behavior change in Croatian Generation Z with respect to their exposure to the COVID-19 pandemic.*

It is assumed that those hit "harder" by the COVID-19 pandemic, i.e. having more serious exposure themselves and/or in their family and friends, will change their behavior more than those who have no direct or indirect experience with the pandemic.

Consumer spending has fallen across America and Europe since the beginning of the Corona crisis. Consumption levels have fallen by 25 percent in Europe, especially since mid-March in the UK, France, Spain, and Italy. At the same time, the con-

sumption in the US. decreased by 10%. Globally, consumers still spend (and sometimes more) on home entertainment as well as basic products such as food, household items, and personal care items. However, they significantly withdraw voluntary expenditure in most countries except China. Some of the fastest decreasing categories include restaurants, clothing, shoes, jewelry, accessories, travel, and outside entertainment (Aksoy & Ergen, 2020). Besides the shifts in product preference, changed and/or limited access to a number of social goods (education, health, etc.) can be interpreted as quality of life deterioration. A global study (Life with corona, 2020) has found that younger people, especially Generation Z, are significantly harder hit by all three aspects of the pandemic: social, emotional, and economic. A few studies have indicated that being a student and being younger than 35 (mostly Generation Z) is associated with a stronger impact on the decreasing quality of life perception (Wang et al., 2020; Liu et al., 2020; Sønderskov et al., 2020). Therefore, the second hypothesis is:

H2: There is a statistically significant difference in the perception of life quality change in Croatian Generation Z with respect to their exposure to COVID-19.

Other than only testing the difference in the perception of life quality change with respect to the exposure to COVID-19, it is interesting to see whether changes in buying behavior are correlated with the perception of life quality change. The third hypothesis is:

H3: Significant changes in consumer behavior of Croatian Generation Z enforced by the COVID-19 pandemic are correlated with their perceived quality of life.

It is assumed here that those who have, due to the COVID-19 pandemic, changed their buying behavior more, will also show changes in their perception of life quality.

3. Methodology

A COVID-19 and youth project was created with university students of the Croatian university who participated in online research. The students were encouraged and incentivized to recruit further participants to obtain a richer subject pool in terms of geographical and other characteristics. Neither participation nor recruitment was compulsory. Those who participated (n=30) recruited other participants from all Croatian regions. Our procedures resulted in a final sample of 442 Croatian participants aged 18 – 25, of which 76.1 % were females. More details on the sample are given in Table 1.

Table 1 Sample description

		N	%
Gender			
	Male	104	23.9
	Female	332	76.1
Year of study			
	1	73	16.7
	2	55	12.6
	3	91	20.9
	4	111	25.5
	5	88	20.2
Place of residence			
	City/town	332	76.1
	Village	81	18.6
	Suburbs	21	4.8
Household income			
	Up to 5000 HRK	80	18.3
	5001 – 7500 HRK	93	21.3
	7501 – 10 000 HRK	113	25.9
	10 001 – 15 000 HRK	85	19.5
	More than 15 000 HRK	65	14.9

Source: Authors

Since this study tries to see the impact of COVID-19 exposure on consumer behavior change, three levels of exposure have been predefined: no direct exposure, meaning that neither the respondent nor anyone in his/her close family and friends circles was exposed to COVID-19, light exposure, where the respondent or some members of his/her family and/or friends were ill, but with light symptoms and could handle the illness at home or were in self-isolation, and hard exposure, where respondents and/or their family member or friends have developed a more complicated type of the disease, had to be hospitalized or have died. Table 2 depicts respondents' level of exposure to COVID-19.

Table 2 Respondents' level of exposure to COVID-19

Personal level of exposure to COVID-19	%
Respondents who have been in self-isolation.	13.3
Respondents who have overcome the disease with mild symptoms (home treatment).	7.1
Respondents who have overcome the disease with more complicated symptoms (hospital treatment).	0.5
Respondents who had no personal exposure to COVID-19.	79.1
Level of exposure to COVID-19 of respondents' close family/friends	**%**
Respondents' close family/friends have been in self-isolation.	26.8
Respondents' close family/friends have overcome the disease with mild symptoms (home treatment).	37.4
Respondents' close family/friends have overcome the disease with more complicated symptoms (hospital treatment).	3.2
Respondents' close family/friends have died from the disease.	1.1
Respondents' close family/friends had no exposure to COVID-19.	31.4

Source: Authors

After conducting the research and obtaining all the necessary data, it was processed and analyzed using the Statistical Package for the Social Sciences (SPSS). The ANOVA test was used to identify statistically significant differences between the increase in online shopping and the level of exposure to the COVID-19 pandemic.

4. Results and discussion

To test H1, the ANOVA test was used. The results have shown some differences in buying behavior change in Generation Z, but altogether they were significantly lower than expected. Three types of changes in shopping behavior were tested: increase of online shopping, decrease of offline shopping and stockpiling.

Table 3 Differences in online shopping increase with respect to exposure to COVID-19 (ANOVA)

ANOVA					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	6.335	3	2.112	3.165	.024
Within Groups	287.543	431	.667		
Total	**293.877**	**434**			

Source: Authors

Table 4 Differences in online shopping increase with respect to exposure to COVID-19 (descriptive analysis)

	N	**Mean**	**Std. Deviation**	**Std. Error**
Self-isolation	58	1.8506*	.92859	.12193
Had COVID-19 (home treatment)	31	1.7204	.89896	.16146
Had COVID-19 (hospital treatment)	2	1.6667	.94281	.66667
Not exposed to COVID-19	344	1.5145*	.78851	.04251
Total	**435**	**1.5747**	**.82288**	**.03945**

* statistically significant difference ($p<0.05$)
Source: Authors

The results of the ANOVA analysis and Bonferroni's post hoc test have shown a statistically significant difference in the increase of online shopping between those respondents who were mildly exposed to COVID-19 (self-isolation) and those who were not exposed to COVID-19. This is quite logical, since self-isolation has forced many families to turn to online shopping, even for daily supplies. These results correspond to global trends identified in several studies: they have been recorded in India (Agarwal & Singh, 2021), Greece (Theodoridis & Kavoura, 2021), Italy (Amatulli, et al., 2021; Ali Taha et al., 2021), Slovakia (Ali Taha et al., 2021), and many other countries worldwide.

However, there was no statistically significant change in the decrease of offline shopping with respect to the level of COVID-19 exposure, which is illustrated in Table 5.

Table 5 Differences in offline shopping decrease with respect to exposure to COVID-19 (ANOVA)

ANOVA					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	2.773	3	.924	.610	.609
Within Groups	652.559	431	1.514		
Total	**655.332**	**434**			

Source: Authors

This finding can probably be explained by specific characteristics of Generation Z regarding their buying habits: Generation Z is a young, technology-oriented group in retailing, since they use their smartphones and other technologies very extensively for shopping (Bernstein, 2015). She calls them "digital natives" to emphasize the role of digital in their shopping behavior. A study by Priporas et al. (2017) also concludes that Generation Z customers are heavy online shoppers. Therefore, they probably do not perceive their already infrequent physical shopping activities to have further declined.

The third buying behavior change tested, stockpiling, has shown a statistically significant difference between those who were mildly exposed to COVID-19 and those who were not (Tables 6 and 7). Those respondents who have experienced self-isolation have stockpiled significantly more than those who were not (results of Bonferroni's post hoc test).

Table 6 Differences in stockpiling practice with respect to exposure to COVID-19 (ANOVA)

ANOVA					
	Sum of Squares	**df**	**Mean Square**	**F**	**Sig.**
Between Groups	10.658	3	3.553	2.751	.042
Within Groups	556.539	431	1.291		
Total	**567.198**	**434**			

Source: Authors

Table 7 Differences in stockpiling practice with respect to exposure to COVID-19 (descriptive analysis)

	N	**Mean**	**Std. Deviation**	**Std. Error**
Self-isolation	58	2.1466*	1.23902	.16269
Had COVID-19 (home treatment)	31	1.9516	1.32511	.23800
Had COVID-19 (hospital treatment)	2	1.0000	.00000	.00000
Not exposed to COVID-19	344	1.7297*	1.10176	.05940
Total	**435**	**1.7977**	**1.14320**	**.05481**

* statistically significant difference ($p<0.05$)
Source: Authors

Some studies on stockpiling during the COVID-19 pandemic indicate that consumer behavior is different regarding the timeline of the pandemic: In its early stages, consumer behavior was very similar to the one found in previous negative externalities of similar type and lead to stockpiling (Loxton et al., 2020; Hall et al., 2021), while the ongoing uncertainty evoked by the pandemic may lead to transformative consumption patterns in the long term (Kirk & Rifkin, 2020). Since this study was conducted in a relatively early phase of the pandemic, it shows that stockpiling was typical behavior of those who experienced self-isolation.

According to the obtained results, it seems that the most changes in Generation Z buying behavior have occurred in the group who had to be in self-isolation (usually for two weeks). Their behavior was probably determined by fear of getting ill (themselves or their contacts) and associated perceived risk, at least for the near future. On the other hand, those who had COVID-19 felt that they are safe for the future and turn to "normal" life and behavior. H1 is, therefore, only partially accepted.

The ANOVA test was used to test H2. When analyzing the difference in the perception of change of the quality of life with respect to their own exposure to COVID-19, no significant differences were found (p=0.525). The perception of change of the quality of life due to the "new normal" has been measured with Likert's 1-5 scale (1 – "new normal" has not changed the quality of my life at all, 5 – "new normal" has changed the quality of my life for the worse a lot). The descriptive analysis is shown in Table 8.

Table 8 Descriptive statistics for the perception of change in life quality – Croatian Generation Z respondents' level of exposure to COVID-19

	N	Mean	Std. Deviation	Std. Error
Self-isolation	51	3.569	1.3906	.1826
Had COVID-19 (home treatment)	38	3.774	1.2572	.2258
Had COVID-19 (hospital treatment)	2	2.500	2.1213	1.5000
Not exposed to COVID-19	344	3.703	1.3223	.0713
Total	**435**	**3.685**	**1.3284**	**.0637**

Source: Authors

Also, analyzing the level of exposure to COVID-19 of family/friends close to respondents, no significant differences have been found (p=0.124). Results of the descriptive analysis are shown in Table 9.

Table 9 Descriptive statistics for the perception of change in life quality – Croatian Generation Z' close family/friends' level of exposure to COVID-19

	N	Mean	Std. Deviation	Std. Error
Respondents whose close family/friends have been in self-isolation.	117	3.803	1.2334	.1140
Respondents whose close family/friends have overcome the disease with mild symptoms (home treatment).	163	3.730	1.3197	.1034
Respondents whose close family/friends have overcome the disease with more complicated symptoms (hospital treatment).	14	4.143	1.2315	.3291
Respondents whose close family/friends have died from the disease.	5	4.200	.4472	.2000
Respondents whose close family/friends had no exposure to COVID-19 pandemic.	137	3.467	1.4197	.1213
Total	**436**	**3.686**	**1.3270**	**.0635**

Source: Authors

As expected and in line with the Life with corona network study (2020), Generation Z perceives their quality of life decreasing due to imposed measures that have forced them to change their buying behavior. However, there are no significant differences between their perceived quality of life decrease in relation to their level of exposure to COVID-19 or the level of exposure of people close to them. It is different from a few other studies, the most extreme case being Lim's (2020) research, which has found 71% of Generation Z respondents in Asia Pacific region stating that the economic fallout of COVID-19 negatively affects their mental health and well-being.

Based on the results obtained, H2 has not been accepted. However, the results of descriptive statistics show that respondents whose close contacts were exposed to COVID-19 express a higher level of perceived decrease of life quality.

To test H3, whether there is a correlation between buying behavior change and perceived life quality change, a correlation analysis has been performed. Variables that describe buying behavior change, namely "increase in online shopping", "decrease in offline shopping" and "stockpiling", have each been correlated with the variable "change in life quality". The results have shown that there were no statistically significant correlations between the increase in online shopping and the change in life quality perception (p=0.852). Also, no correlation has been found between the decrease in offline shopping and the change in life quality perception (p=0.461). Finally, correlating stockpiling and change in the quality of life also showed no significant correlations (p=0.903). It can be concluded that changes in buying behavior of Croatian Generation Z do not correlate with their perceptions of change in the quality of life, so H3 is not accepted.

5. Conclusion

This research offers original findings on shifts in Croatian Generation Z consumers' behaviors and their implications for their quality of life perceptions. The results have shown that their buying behavior has changed in relation to their exposure to COVID-19 in some aspects. Croatian Generation Z respondents who have self-isolated due to the COVID-19 pandemic have said that they buy more online than they did before the pandemic compared to those who have not been directly exposed to COVID-19. The general increase in online shopping seems to be a global trend, and Croatian Generation Z, according to this study, follows the trend. But, when it comes to decreased offline shopping, the results have shown that Croatian Generation Z does not show any statistically significant differences in relation to their exposure to COVID-19. Since they were identified as heavy online shoppers even before the pandemic, they probably do not perceive their already infrequent physical shopping activities to have further declined. When it comes to stockpiling as a buying behavior change, the results have shown that respondents who have experienced self-isolation stockpile significantly more than those who have not been affected by the virus at all.

According to the results of this research, it seems that the most changes in Generation Z buying behavior have occurred in the group who had to self-isolate (usually for two weeks). Their behavior was probably determined by fear of getting ill, while on the other hand, those who had COVID-19 perceive that they are safe for the future and turned to their normal behavior.

When it comes to the change in the perception of their quality of life, it is evident that Generation Z perceives that their quality of life has decreased, but with no statistically significant differences between the levels of exposure to COVID-19. The lack of difference between groups can be explained by the general perception of life quality decrease. Even the people who have not been infected with the virus have expressed that their quality of life has changed for the worse. This is probably the result of numerous measures implemented to control and stop the pandemic (reduced social contacts, closing the stores, restaurants and cafes, postponing concerts and other cultural events, etc.). However, the perception of the decrease in life quality shows no correlation with the changes in buying behavior so it is evident that changes in buying behavior could not be the reason for the decreased quality of life. It could be expected that these changed buying behaviors could remain even after the pandemic is over and become the standard new normal behavior for Generation Z.

The limitation of this study is determined by the sample which is not fully representative. For this reason, the results of this study can only be taken as indicative. Future research should investigate buying behavior changes that have occurred as a consequence of the COVID-19 pandemic in Generation Z in more detail. For example, it would be interesting to study future intentions in buying behavior and predict changes that are going to be adopted by Generation Z and retained even after the pandemic ends. Moreover, since several studies have indicated that there are generational differences, it would be of interest to compare results on consumer behavior changes for other generations.

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CONSCIOUS FOOD CHOICES – DIFFERENCES BETWEEN PERCEIVED BENEFITS AND WILLINGNESS TO PAY FOR DIFFERENT PRODUCT TYPES

Abstract

Purpose: Consumers increasingly make conscious choices when it comes to food and choose healthy products that protect the natural environment and preserve traditional habits and communities. This study investigates the differences between perceived benefits and willingness to pay for products making different marketing claims yet all suggesting producers' dedication to protect the health of consumers as well as natural and traditional resources.

Methodology: First, focus groups were conducted to identify food marketing claims (i.e., product types) that are relevant to consumers and empirically validate the relevance of the perceived benefits identified in previous research. Second, questionnaires were distributed to consumers to analyse the differences in perceived benefits and willingness to pay between the identified product types.

Results: The focus groups revealed that apart from natural and traditional products, handmade, homemade, and autochthonous products represent important marketing claims. They also proved that most benefits identified in literature resonate well with consumers of the studied cultural context. Results of the questionnaire show that emotional benefits are not perceived differently for different product types, functional benefits are perceived higher for natural and handmade products than for traditional ones, while convenience is perceived as higher only for handmade products. Willingness to pay is not different for different product types nor benefits.

Conclusion: Since some product types are perceived as providing more benefits than others, small food producers should focus on marketing their products as handmade and natural, rather than traditional. Furthermore, marketing efforts should be directed towards identifying the right consumer segments as those inclined to the protection of traditional resources perceive higher benefits regardless of the product type.

Keywords: Traditional, natural, handmade, homemade, autochthonous, perceived benefits

1. Introduction

According to Angus and Westbrook (2020), major consumer trends boil down to consumers returning to their roots, doing everything from the comfort of their home, caring for their well-being and buying local, personalized, non-polluting products. Reacting to those trends, many marketers promote their food products in vague terms such as fresh, local, natural, artisan, and sustainable (Del Gigante, 2013). When faced with such marketing claims, especially when combined, consumers often envision an idyllic image of a small family farm which produces healthy products, while protecting natural and traditional resources. Because marketing claims that underline health, environmental and ethical concerns are appealing to modern consumers (Ghvanidze et al., 2019), yet most of them are very vague and legally not well regulated (Wenzig & Gruchmann, 2018; Berry et al., 2017), they require more attention by researchers and policymakers.

In the focus of this research are two of those underdefined claims: *traditional* and *natural*. Globally, their relevance is evidenced in the big and growing market shares (Cao & Yan 2016; Savelli et al., 2019), and locally in the smart specialization guidelines of the Croatian Primorsko-goranska county (cf. Prigoda, 2020) according to which the protection of natural and traditional resources represents one of the priorities that need higher practitioners' and academic attention. Also, these two claims differ enough from one another yet in a parsimonious way represent umbrella claims for many similar ones.

Previous research explored what natural (Petty, 2015; Rozin, 2005) and traditional (e.g., Guerrero et al., 2009; Cerjak et al., 2014) products represent and what benefits consumers get when purchasing natural (Umberger et al., 2009; Berry et al., 2017) or traditional products (Barska & Wojciechowska-Solis, 2018; Vanhonacker et al., 2010; Wang et al., 2016). However, comparing these two types of products, or similar vaguely defined types of products that consumers consider good alternatives to natural and traditional products, captured only scarce attention of researchers so far.

The objective of this paper is, thus, to explore the benefits that consumers perceived to be specific for widely used yet underdefined marketing claims related to natural and traditional production and how those benefits reflect in consumer willingness to pay (henceforth: WTP). Our findings are particularly important for small food producers as their production usually complies with the protection of natural and traditional resources, yet lack of resources limits their branding efforts (Renton et al., 2016). Our findings will help them understand which claims are preferred by consumers so they can stand a chance against incomparably more resourceful competitors.

2. Previous research

This study is exploratory in nature, so the main purpose of the literature review was to explore the most studied perceived benefits related to natural and traditional food products and how they relate to WTP. We searched for articles published in journals indexed in WoS SSCI and SCI to ensure they have undergone a rigorous review process. Further, to include only contemporary, research-based research without a language barrier, we narrowed our search down to articles in English published between 2000-2020.

2.1 Natural products, their benefits and WTP

Marketing research (e.g., McFadden & Huffman, 2017; Berry et al., 2017; Syrengelas et al., 2018) most often defines natural products according to the USDA (2005) definition which focuses on the two defining characteristics: no artificial flavour, colouring ingredient, chemical preservative, or any other artificial or synthetic ingredient; and the minimal processing of the product and its ingredients. Similarly, the most relevant research on the consumer perception of the meaning of natural products conducted by Rozin et al. (2012) found consumers across Europe and the US agree that the natural claim refers to the absence of "negative" features (e.g., additives, human intervention), rather than the presence of positive ones.

When it comes to perceived consumer benefits, prior research found that natural products are perceived as providing many benefits. Umberger et al. (2009) differentiate between personal benefits, social health concerns and societal benefits. According to them, personal benefits include nutrition, quality and safety. Likewise, social health concerns include potential antibiotic resistance and unknown hormonal effects, which is related to the healthy benefit discovered by Rozin et al. (2012) and Berry et al. (2017). Finally, under societal benefits, Umberger et al. (2009) include support for local agriculture and environmental benefits. Rozin et al. (2012) also found benefits like tasty to be related to natural products.

Prior research often also investigated WTP for natural products. Researchers were most interested in how WTP changes when consumers receive various information on what natural stands for (Gifford & Bernard, 2011; McFadden & Huffman, 2017) and which behavioural and psychographic consumer profiles are linked to WTP (Migliore et al., 2020). In the context of this study, the results by Umberger et al. (2009) are particularly interesting. They studied the relationship between benefits and WTP and found that personal benefits, social health concerns and societal benefits that consumers relate to natural products all contribute to WTP, the influence being the strongest for social health concerns.

2.2 Traditional products, their benefits and WTP

According to previous research (e.g., Balogh et al., 2016; Pieniak et al., 2009; Kühne et al., 2015), the most important regulation which defines traditional products is Regulation (EU) 1151/2012 (and its earlier version, Council Regulation (EC) 509/2006) on quality schemes for agricultural products and foodstuffs. It says that "traditional' means proven usage on the domestic market for a period that allows transmission between generations; this period is to be at least 30 years". Trichopoulou et al. (2007) made an important contribution by elaborating on the definition of traditional in the Regulation. According to them "traditional means conforming to established practice or specifications prior to the Second World War". Furthermore, they define traditional food as distinguished from similar products in terms of the use of traditional ingredients, traditional composition, or traditional type of production and/or processing method which are characterised by being used prior to WWII in identifiable geographical areas and remain in use today. Marketing researchers also investigated how consumers perceive traditional products. The most important contribution in that regard was provided by Guerrero et al. (2009), who view traditional products as those frequently consumed or associated with certain celebrations or seasons, transmitted through generations, made specifically according to the gastronomic heritage, with minimal processing, distinguished because of their sensory properties, and associated with a certain location.

Furthermore, the research investigated which benefits consumers relate to traditional products. Wang et al. (2016) divided such benefits into several groups including sensory appeal (taste, smell, and appearance of food), health, symbolic meaning (memories, childhood, family, and nostalgia), and safety. Sensory appeal (particularly taste) and health are benefits that are frequently identified when it comes to traditional products (e.g., Barska & Wojciechowska-Solis, 2018; Cerjak et al., 2014; Renko & Bucar, 2014). The elements of symbolic meaning, in particular childhood memories and specific emotions, are also found to be associated with traditional food by many such as Cerjak et al. (2014); Serrano-Cruz et al. (2018), and Guerrero et al. (2012). Similarly, consumption of traditional food also carries a symbolic meaning related to certain attitudes like the importance of supporting neighbourhood, not purchasing foreign food and the like (Vanhonacker et al., 2010). Perhaps the most comprehensive list of benefits is given by Cerjak et al. (2014), who, besides most of the mentioned benefits, also discovered self-interest benefits such as high energy level, pleasure and enjoyment, and altruistic benefits such as support for rural families and communities, animal welfare and environmental protection.

Previous research also investigated how traditional food consumption related to some other food consumption benefits such as weight control (Pieniak et al., 2009; Vanhonacker et al., 2010), ease and speed of cooking and consumption (Pieniak et al., 2009; Wang et al., 2016; Vanhonacker et al., 2010), economic convenience (Vanhonacker et al., 2010; Pieniak et al., 2009; Savelli et al., 2009) but mostly found that these benefits are not specific for traditional products, but rather for the conventional ones.

Finally, researchers explored WTP in the context of traditional products. Ballco and Gracia (2020) discovered that traditional products that carry a Protected designation of origin quality label and those locally or regionally produced display the highest WTP. Similarly, Balogh et al. (2016) found quality label, retail outlet, price, and type of ingredients to be significant predictors of WTP for traditional products.

3. Methodology

3.1 Procedure

Given the exploratory nature of our study, we first conducted consumers focus groups aiming to:

- assess whether benefits relevant in previous research also resonate with Croatian consumers and,
- identify food marketing claims (i.e., product types) other than natural and traditional that trigger consumer attention when it comes

to food produced by small farm producers devoted to the protection of natural and traditional resources.

Four focus groups were conducted, each comprising three to seven participants; 20 overall. Demographics was dispersed in terms of gender and age, although in favour of female (14 vs. 6) and younger (mean age = 33) participants. In terms of education, we have purposely chosen those with higher education (7 students of the master studies, 6 master graduates and 7 PhD graduates) as they are more likely to make conscious food choices (Ghvanidze et al., 2019).

Table 1 shows that most of the benefits identified in the literature were considered as relevant in the focus groups. On the other hand, the focus groups also discovered a benefit not found in literature: *enable the consumer to create a relationship with the manufacturer*. Inspired by the classification of benefits by Umberger et al. (2009) for natural and Pieniak et al. (2009) and Savelli et al. (2019) for traditional products, we have classified the benefits into two main categories: self-interest and altruistic benefits.

Table 1 List of studied perceived benefits

Benefit	Type	Prior research		Focus groups
		Natural	Traditional	
Give the consumer a lot of energy [1]	Self-interest		X	X
Healthy	Self-interest	X	X	X
Nutritious	Self-interest	X	X	
Help the consumer control the weight [2]	Self-interest		X	
Safe for the consumer	Self-interest	X	X	X
Evoke positive emotions in customers	Self-interest		X	X
Remind the consumer of childhood	Self-interest		X	X
Tasty	Self-interest	X	X	X
Provide pleasure to consumers [1]	Self-interest		X	X
Enable the consumer to create a relationship with the manufacturer	Self-interest			X
Enable the consumer to identify as a person of certain attitudes	Self-interest		X	
Provide financial savings for the consumer [2]	Self-interest		X	
Provide time and energy savings for the consumer [2]	Self-interest		X	
Help sustain rural families and communities	Altruistic	X	X	X
Contribute to the public health improvement (no effect of animal antibiotics and hormones on humans) [1]	Altruistic	X		
Contribute to animal welfare	Altruistic	X	X	
Do not harm the environment	Altruistic	X	X	X

[1] adjusted during pre-testing
[2] explored in previous research, but not found to be specific for traditional products
Source: Authors

As for the second purpose of the focus groups, we have identified that, apart from traditional and natural claims, participants especially appreciate: organic/eco-labels, handmade and homemade claims and products originating from a specific region (e.g., Neretva mandarins, Istrian prosciutto or Slavonian kulen). Since in the focus of our interest were unregulated claims and not official, by a regulation defined labels, we have not included organic/eco-labels in further research. Furthermore, although there is ample research on local foods, we did not find this claim to be of interest for the focus group participants.

However, for products originating from a specific region, we pondered whether to define them as local products, but concluded it would not be appropriate since the Neretva and Slavonia regions that were often mentioned by the focus groups participants are the furthermost regions of Croatia from the Kvarner region in which the focus groups were conducted. On the other hand, according to the Oxford learner's dictionary (2021) the word autochthonous means "of people who live in a particular place" or "formed in its present position", so this claim was considered to appropriately capture the intended meaning of products like Slavonian kulen and was thus included in further analysis.

To further ensure that traditional, natural, handmade, homemade, and autochthonous represent the five most relevant food marketing claims, we have screened webpages of a dozen of the famous Croatian brands within the product categories identified as those preserving natural and traditional resources during the focus groups. We have found that traditional and natural are very commonly used claims, especially traditional, but autochthonous and handmade are quite present as well. Homemade is less often applied, but more often than e.g., local. Hence, we proceeded with the five above-mentioned marketing claims (henceforth: product types).

Before conducting the main quantitative research, the initial questionnaire underwent expert evaluation and a pilot study. The purpose of the expert evaluation was to examine the clarity of the questionnaire and define how to set up the initial stimulus and generally structure the questionnaire to minimize the framing influence on the respondents. Five methodology and marketing experts were consulted at this stage. Based on their input, we slightly changed some questions for more clarity. We also decide that the best initial stimulus in the survey would be asking respondents to imagine a situation in which "*they invited gourmand friends over for dinner and since they were aware the friends loved anything that is X (to be replaced by one of the identified product types), they did their best to serve X products.*" The questionnaire would proceed with two open-ended questions (*which products would they serve their friends* and *where would they get those products*). Such an introduction enables respondents who are not regular users of X product to relate to the situation. It also removes the effect of scepticism towards the marketing claims that could bother some respondents have we shown an image of a product labelled as X product type. Finally, it makes respondents think exactly of a type of product that X product type represents for them. The questionnaire would then proceed to investigate consumer perception of the studied product types with special emphasis on perceived benefits and willingness to pay. The questionnaire would end with several consumer profiling questions, i.e., control variables.

After the expert evaluation, we have prepared five questionnaires (one for each product type) and conducted a pilot study by distributing each of the questionnaires to 1-3 consumers (face to face or by phone) aiming to test whether all the questions were clear. During filling in of the questionnaire, we allowed the respondents to comment on anything they found unclear. Based on the pilot study, several items were adjusted and refined as Table 1 shows. After the fine-tuning based on the pilot research, we have back-translated all the scales to English and in that stage found no problems.

Finally, in the main study, the final five questionnaires were uploaded online. They were distributed to senior business students (3rd year undergraduate studies and master studies) of the University of Rijeka. Senior students are easily accessible and, unlike junior students, expected to have started making conscious food choices. Each respondent filled out only one questionnaire. The questionnaires were mostly distributed to students during an online class, while the minority of the students received an e-mail with an invitation to fill it in.

3.2 Concept measurements

The main concepts in our study were product type, benefits and WTP. As we described, product type was an initial stimulus. When it comes to benefits, since this was an exploratory study, we did not have a priori defined dimensions of the concept but a list of 17 benefits originating from literature review and focus groups as previously described and shown in Table 1. Respondents had to evaluate each benefit on a 7-point Likert scale. WTP was measured by a simple open-ended question: *how higher a price (in %) were they willing to pay for X products than for the conventional ones*.

Finally, we included a set of profiling questions that represented control variables. Apart from the standard demographic variables (age, gender, and household income), we also included a behavioural

variable (consumption intensity) and two psychographic variables (importance of preservation of natural resources and importance of preservation of traditional resources). Age and gender were measured by open questions, while to measure household income we asked the respondents to choose from 5 options. Consumption intensity was measured with a single item 7-point scale previously used in Vanhonacker et al. (2013) and Pieniak et al. (2013). This scale asks respondents to choose an option ranging from "not at all a consumer of X products" to "very much a consumer of X products". The importance of preservation of natural resources and the importance of preservation of traditional resources were measured on a scale developed by Dibrell and Craig (2006) and reused on natural environment attitudes by Dibrell, Craig and Hansen (2011). We used it in its original form to measure the importance of preservation of natural resources and in an adjusted form so that the word "natural" was replaced by the word "traditional" in all the items to measure the importance of preservation of traditional resources. Items are presented in Tables 5 and 6.

4. Results

4.1 Descriptive statistic

In total 169 respondents completed an online survey in April 2021. For each product type we collected more than 30 responses. Two respondents were excluded due to missing data in WTP, and one was detected as an outlier using a box plot diagram for WTP. All the respondents declared themselves as users of the studied product types, so no one was excluded for that reason. As Tables 2 and 3 show, the product type based subsamples are homogeneous according to their gender ($\chi^2 = 6.12$; df = 8; p = 0.634), income ($\chi^2 = 17.83$; df = 16; p = 0.334), consumption intensity ($F_{4,161} = 1.47$; p = 0.213), importance of traditional resources ($F_{4,161} = 0.42$; p = 0.794), and importance of natural resource ($F_{4,161} = 0.26$; p = 0.902). Respondents in autochthonous subsample are significantly older than those in handmade, homemade, and natural subsamples ($F_{4,161} = 4.259$; $p<0.05$), but across subsamples respondents are in their twenties, hence the difference is not expected to influence the results.

Table 2 Descriptive statistics across product types

Product type	N	Age	Gender	Consumption intensity	Importance of pres. of natural res.	Importance of pres. of traditional res.
Autochthonous	40	M = 29; sd = 8.0	73% F	M = 5.25; sd = 0.8	M = 6.32; sd = 1.01	M = 5.76; sd = 1.21
Homemade	31	M = 25; sd = 6.5	74% F	M = 5.61; sd = 0.8	M = 6.14; sd = 1.13	M = 5.44; sd = 1.33
Natural	33	M = 24; sd = 4.2	76% F	M = 5.12; sd = 1.1	M = 6.16; sd = 0.98	M = 5.47; sd = 1.42
Handmade	30	M = 24; sd = 2.7	83% F	M = 5.23; sd = 0.8	M = 6.07; sd = 1.22	M = 5.38; sd = 1.60
Traditional	32	M = 27; sd = 8.5	81% F	M = 5.03; sd = 1.4	M = 6.16; sd = 1.03	M = 5.55; sd = 1.29

Source: Authors

Table 3 Household income per month across product types (% per category)

Product type	N	Up to 3.000 HRK	3.001 to 6.000 HRK	6.001 to 12.000 HRK	12.001 to 18.000 HRK	More than 18.000 HRK
Autochthonous	40	3 %	10 %	30 %	38 %	20 %
Homemade	31	10 %	6 %	35 %	32 %	16 %
Natural	33	9 %	12 %	42 %	27 %	9 %
Handmade	30	17 %	13 %	43 %	20 %	7 %
Traditional	32	3 %	19 %	50 %	13 %	16 %

Source: Authors

4.2 Data reduction

To examine the central concept of the study (perceived benefits), we have conducted exploratory factor analysis (EFA) as it serves to understand and clarify new scales (Hair et al., 2019). Principal Axis Factoring (PAF) was used because the goal of this

analysis was to find an underlying structure of a concept and identify the structure of items (Costello & Osborne, 2005). Direct oblimin rotation was used since factors are conceptually expected to be moderately correlated. The solution with 3 factors (number of factors suggested according to the criteria Eigenvalue higher than 1) explained 59.75% of the variance and communalities for the 17 items were generally good (four were just slightly under 0.4, while others were above). Furthermore, the solution created three content-wise logical factors: Functional benefits, Emotional benefits and Convenience as shown in Table 4. Thus, this solution was retained. Two items cross-loaded on the first two factors but were kept in the first one due to the content fit and higher factor loadings, while an item that cross-loaded on the first and the third factor was included to the third based on its content fit although it loaded better onto the first factor.

Table 4 Factor solution for the perceived benefits construct

	Functional benefits	Emotional benefits	Convenience
Healthy	**0.86**		
Help the consumer control the weight	**0.77**		
Do not harm the environment	**0.74**		
Contribute to the public health improvement (no effect of animal antibiotics and hormones on humans)	**0.66**		
Safe for the consumer	**0.61**	-0.36	
Give the consumer a lot of energy	**0.50**		
Contribute to animal welfare	**0.43**		
Nutritious	**0.43**	-0.38	
Provide pleasure to consumers		**-0.85**	
Tasty		**-0.83**	
Evoke positive emotions in customers		**-0.68**	
Enable the consumer to create a relationship with the manufacturer		**-0.64**	
Help sustain rural families and communities		**-0.62**	
Remind the consumer of childhood		**-0.60**	
Enable the consumer to identify as a person of certain attitudes			**0.40**
Provide time and energy savings for the consumer			**0.40**
Provide financial savings for the consumer	0.44		**0.31**
Cronbach's alpha	0.86	0.85	0.64
KMO	0.89		
Bartlett's test of sphericity	<0.001		

Source: Authors

Cronbach's alphas of the items belonging to the three factors were higher than 0.6, which indicates satisfying internal consistency of data (cf. Peterson, 1994). No indication for improvement of Cronbach's alpha when omitting an item was found.

Repeating a similar procedure, factor analysis was conducted for items measuring the importance of the preservation of natural resources. Factor analysis (PAF with oblimin rotation) suggested two factors explaining 74% of variance as Table 5 shows. One of these factors represented the importance of

natural resources, while the other relative importance as compared to the importance of other business goals. We decided not to keep the second factor because we were interested in the importance and not relative importance. Furthermore, the latter only contained two items with Cronbach's alpha of 0.4. Factor analysis was re-run with the three items and one factor was extracted (Table 5) with no communalities below 0.4 and high factor loadings. Cronbach alpha was high at 0.84.

Table 5 Factor solution for construct importance of preservation of natural products

	Factor solution 1		Factor solution 2
	Importance	**Relative importance**	**Importance**
In the future, the protection of natural resources should be seen as part of business success.	**0.87**		**0.86**
Businesses need to invest more resources in the protection of natural resources.	**0.79**		**0.79**
Business leaders should be first in line in protecting natural resources.	**0.77**		**0.77**
Businesses should not be committed to protecting natural resources because this would jeopardize their profitability.		**0.58**	
We must protect natural resources at the cost of losing jobs in our community.	0.32	**0.56**	
Cronbach's alpha	0.84	0.4	0.84
KMO	0.72		0.73
Bartlett's test of sphericity	<0.001		<0.001

Source: Authors

For measuring the importance of traditional products, the same procedure was repeated, and the results were almost identical as with importance of natural products. We also decided to keep the three-item single factor solution. Items of the two analyses are shown in Table 6.

Table 6 Factor solution for construct importance of preservation of traditional products

	Factor solution 1		Factor solution 2
	Importance	**Relative importance**	**Importance**
Businesses need to invest more resources in the protection of traditional resources.	**0.88**		**0.92**
Business leaders should be first in line in protecting traditional resources.	**0.83**		**0.78**
In the future, the protection of traditional resources should be seen as part of business success.	**0.81**		**0.82**
Businesses should not be committed to protecting traditional resources because this would jeopardize their profitability.		**0.61**	
We must protect traditional resources at the cost of losing jobs in our community.	0.37	**0.51**	
Cronbach's alpha	0.88	0.37	0.88
KMO	0.71		0.73
Bartlett's test of sphericity	<0.001		<0.001

Source: Authors

For further analysis, the latent construct for each extracted factor was computed as a mean of the corresponding items.

4.3 Hypotheses testing

After defining latent constructs, outliers were detected using z-scores for each of the variables (functional benefits, emotional benefits, convenience, importance of preservation of natural products, importance of preservation of traditional products, age, gender, household income, and consumption intensity). Outliers are usually considered responses with z-scores higher than +/-3. Based on this criteria, in total 12 responses were eliminated, leaving 154 responses in the sample for further analysis.

The one-way ANOVA with Bonferroni post-hoc test was run on the 4 dependent variables, i.e., functional benefits, emotional benefits, convenience and WTP (Table 7). There is no significant difference in mean WTP, emotional benefits and convenience between product types. The only difference was found in functional benefits so that they were perceived as the least beneficial and significantly lower for traditional products than for natural ones (p = 0.034, means bolded in Table 7). This was a signal that in the multiple regression models that we shall conduct, traditional products can be used as a reference group and all other product types assessed relative to them. That is, 4 dummy variables were created (for each product type other than traditional) so that their coefficients in the regression would indicate the difference of each from the traditional product.

Table 7 Difference between means in dependent variables according to product types

Product type	WTP (M; sd)	Functional benefits (M; sd)	Emotional benefits (M; sd)	Convenience (M; sd)
Autochthonous	37.76; 28.88	5.24; 0.99	6.21; 0.67	4.61; 1.26
Homemade	30.30; 28.97	5.28; 1.11	6.13; 0.84	4.43; 1.31
Handmade	33.11; 27.11	5.53; 0.96	6.23; 0.63	4.85; 1.22
Natural	29.43; 20.26	**5.81; 0.81**	6.02; 0.72	4.70; 1.04
Traditional	41.02; 28.76	**5.05; 0.89**	6.12; 0.80	4.26; 1.05

Source: Authors

Our main model thus consisted of four independent variables (product types), three mediating variables (perceived benefits) and a dependent variable (WTP). We first conducted a regression analysis to examine the effect of all independent and mediating variables on WTP. In the regression, we also included six control variables (household income, gender, age, consumption intensity, importance of preservation of natural resources, and importance of preservation of traditional resources). The model was not significant ($F_{13,140} = 1.713$; p = 0.064). Therefore, we did not proceed to test the mediation effect but focused on investigating whether perceived benefits are influenced by the product type. We conducted three additional regressions, each with one type of benefits as a dependent variable, four independent variables and six control variables.

All three models were significant as Table 8 shows. The model with the highest R^2 (0.31) was the one for emotional benefits, however, in that model, the variance in the dependent variable is entirely explained by control variables. Higher consumption intensity and higher perceived importance of preservation of traditional resources lead to higher emotional benefits. The model for functional benefits, although explaining less variance in the dependent variable overall ($R^2 = 0.22$) is more interesting as it shows the effect of the observed independent variables. That is, natural (beta = 0.30; p = 0.00) and handmade (beta = 0.18; p = 0.06) products are perceived as providing higher functional benefits than traditional products. Of the control variables, only the consumption intensity was significant. The last model, the one for convenience, explained 16% of the variance in the dependent variable with handmade products (beta = 0.20; p = 0.05) being a significant predictor of perceived convenience. Of the control variables, only the consumption intensity and importance of preservation of traditional resources were significant.

Table 8 Regressions analyses results

	Functional benefits		Emotional benefits		Convenience	
	$F_{10,143} = 4.032$; $p < 0.001$		$F_{10,143} = 6.354$; $p < 0.001$		$F_{10,143} = 2.618$; $p = 0.006$	
	$R^2 = 0.22$		$R^2 = 0.31$		$R^2 = 0.16$	
Independent	beta	p	beta	p	beta	p
Household income	-0.07	0.36	-0.09	0.25	-0.07	0.41
Gender	0.04	0.59	0.10	0.17	0.04	0.66
Age	0.06	0.48	0.13	0.09	0.05	0.58
Consumption intensity	**0.17**	**0.03**	**0.20**	**0.01**	**0.25**	**0.00**
Importance of pres. of natural resources	0.15	0.12	0.14	0.13	-0.13	0.22
Importance of pres. of traditional resources	0.16	0.10	**0.30**	**0.00**	**0.25**	**0.02**
Autochthonous	0.05	0.64	-0.01	0.91	0.12	0.25
Homemade	0.09	0.38	0.01	0.96	0.04	0.67
Handmade	**0.18**	**0.06**	0.06	0.52	**0.20**	**0.05**
Natural	**0.30**	**0.00**	-0.06	0.49	0.14	0.16

Source: Authors

5. Discussion and conclusion

Perceived benefits of natural or traditional products are generally conceptually divided into two main groups: self-interest benefits and altruistic benefits (cf. Pieniak et al., 2009; Umberger et al., 2009). Conversely, our findings revealed that consumers perceive three major types of benefits (emotional, functional and convenience), two of which combine self-interest and altruistic benefits. This is an important paradigm switch and the first contribution of our research. That is, consumers do not differentiate between self-interest and altruistic motives. We reckon this is because the corporate and general social responsibility idea has to date become so incorporated in public discourse, that it represents a mainstream consumer opinion and a lifestyle driving value (cf. Angus & Westbrook, 2020). Because general research on consumer perceived values (e.g., Franzen & Bouwman, 2001) classifies types of values into several categories including emotional and functional ones; we suggest future research on conscious food choices should apply the same benefits conceptualisation rather than focusing on self-interest vs. altruistic benefits.

Our results also show that all the studied types of products are clearly perceived as providing very high emotional benefits to consumers. On the other hand, although all product types provide pretty high functional benefits and convenience, the former is perceived higher for handmade and natural products than for traditional products while the latter is perceived higher for handmade than for traditional products. We started prior research analysis by thoroughly screening research on natural and traditional products and not only did we find ample research on these two types of products, but we also found that the research shows that natural (e.g., Rozin et al., 2012; Berry et al., 2017) and traditional (e.g., Barska & Wojciechowska-Solis, 2018; Vanhonacker et al., 2010; Cerjak et al., 2014; Renko & Bucar, 2014) products provide benefits to consumers. Our subsequent research on the handmade, homemade, and autochthonous products revealed that within the same research parameters (WOS, SSCI and SCI, article, English and 2000-2020) we could find only a few papers. The revelation of the importance of handmade products for consumers is thus the second contribution of our research. Consequently, we recommend that small produc-

ers devoted to the preservation of natural and traditional resources focus their marketing activities to produce handmade and natural products and clearly communicate these product attributes to consumers. Further, because of the lack of research on handmade products, due to their appeal for the consumers, researchers should focus more attention on this product type.

Furthermore, our results have shown that consumer profile, i.e., the importance of preservation of traditional resources determines two types of benefits, while the importance of preservation of natural resources does not determine benefits. Previously, more attention was given to the latter (e.g., Migliore et al., 2020) in determining consumer behaviour towards natural products. Our results suggest more attention should be given to the former. Also, since attitudes related to the preservation of traditional resources are important in determining perceived benefits, marketers should put significant efforts into selecting and approaching the right consumer segments rather than only choosing which product type to focus on.

Finally, our findings are surprising in that there is no relationship found between neither product type nor perceived benefits with WTP. This is not in line with previous research. For example, Umberger et al. (2009) found that self-interest and altruistic perceived benefits contribute to WTP when it comes to natural products, while Savelli et al. (2019) suggest that traditional products, when managed as experiences, could increase WTP. Our results might have been insignificant because we measured WTP as open-ended, self-reported estimates, while previous research used elicitation techniques such as discrete choice experiment (e.g., Balogh et al., 2016; Syrengelas et al., 2018), or contingent valuation elicitation method (e.g., Umberger et al., 2009; Migliore et al., 2020), hence, further research is needed in that regard.

6. Limitations and future research

Our research was conducted among students. We included only the senior students as they already make conscious food choices, but future research should include various demographics. Also, we had at least 30 respondents evaluate each product type, which is considered a minimum for group comparisons, but a bigger sample could improve the results. When it comes to the questionnaire, we have identified the word "domaći", that we translate as homemade in the paper because of the context it was mentioned in during the focus groups. However, when the questionnaire was distributed to the respondents in the Croatian language, they might have understood "domaći" as "domestic (Croatian)" because in Croatian "domaći" has both meanings. Future research should be careful about this as well. Finally, besides more commonly used functional and emotional dimensions of the benefits, our analysis also yielded the third dimension, convenience. Although its Cronbach alpha was above the critical value, it was at the lower limit and only three items loaded on it, including the one that cross-loaded. Future research should give more attention to validating this dimension and examining its role in the context of conscious food choices.

Finally, apart from overcoming the limitations of the current research, it would be interesting to explore how the studied five product types are understood by the consumers, what are their points of parity and points of difference as observed by the consumers and whether different purchasing outlets play a difference in that sense.

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SUSTAINABLE MARKETING FACTORS: IMPACT ON TOURIST SATISFACTION AND PERCEIVED CULTURAL TOURISM EFFECTS

Abstract

Purpose: This paper discusses tourists' attitudes towards sustainable marketing factors in the context of cultural tourism. It aims to examine the influence of tourists' attitudes on satisfaction with the overall cultural experience and perceived ecological, social, and economic effects and their impact on satisfaction.

Methodology: The survey was conducted in Croatia in 2020 on a sample of 205 domestic tourists. Based on previous research, two sets of marketing items were defined: items closely related to sustainability (CRS) and items not closely related to sustainability (NCRS). Exploratory factor analysis (EFA) was applied to extract factors, followed by Principal Component Analysis (PCA). Multiple linear regression analysis was used to test the factors' impact on satisfaction and perceived cultural tourism effects.

Results: The results of factor analysis generated two CRS factors (*Sustainable destination policies*, *Propensity for sustainable behaviour*) and two NCRS factors (*Respect for cultural heritage*, *Servicescape*). The two CRS factors and the factor *Respect for cultural heritage* have a statistically significant influence on overall satisfaction. Moreover, the results imply that *Propensity for sustainable behaviour* and *Respect for cultural heritage* positively contribute to overall satisfaction. Among all the observed factors, only *Sustainable destination policy* does not significantly influence any perceived cultural tourism effects. In contrast, the perceived socio-cultural and economic effects have a positive influence on tourist satisfaction.

Conclusion: The research results underpin the influence of sustainable marketing factors on satisfaction with the overall cultural experience and perceived tourism effects and their impact on satisfaction. The findings provide new insights into marketing theory and guidelines for marketing managers regarding sustainability in cultural tourism.

Keywords: Sustainable marketing factors, tourist satisfaction, cultural tourism effects

1. Introduction

Given the expansion of tourism in general, the growth of cultural tourism is predicted to continue in the future (Richards, 2018). Because of the complexity of culture itself, the exact share of cultural tourism cannot be determined, but the estimates say that between 50% and 80% of all travels include some element of cultural motivation (Timothy, 2011). Moreover, according to Europa Nostra (2021), approximately 40% of all European tourism is driven by culture.

Due to various positive implications, cultural tourism is considered a desirable direction for destination development (Artal-Tur, 2018; Su et al., 2019). However, its growing popularity causes some negative consequences in terms of the physical transformation of heritage sites (Caserta & Ruso, 2002). According to Moliner et al. (2019), such growth has a negative impact on the environment despite its great benefits to the economy. Thus, environmental sustainability in tourism has become one of the main concerns that has been addressed by many researchers so far (Moliner et al., 2019; Moise et al., 2018; Goffi et al., 2019).

In response to various environmental and socio-economic problems, scholars suggest for cultural destinations to raise their sustainability awareness and to implement new responsible practices (Goffi et al., 2019; Asmelash & Kumar, 2019). Principally, this means limiting the use of resources while making the best use of those available (Cooper & Wahab, 2005). Furthermore, Cuculeski et al. (2016) emphasise the need to consider the tourists' requirements and behaviour. Sustainable tourism development should thus satisfy tourists' and host regions' needs in the present, while improving opportunities to do the same in the future (Iniesta-Bonillo et al., 2016). Despite the several decades of research on tourism sustainability, its practical application is still a challenge (Mihalic, 2016). Therefore, some new research gaps can be seen in terms of the relationship between sustainable cultural tourism and tourist satisfaction (Asmelash & Kumar, 2019), sustainability marketing indicators (Pomering, 2017), or cultural tourism effects (Richards, 2018).

This paper discusses tourists' attitudes towards sustainable marketing factors in the context of cultural tourism. It observes marketing factors that closely relate to sustainability (CRS) and those that do not closely relate to sustainability (NCRS). The main purpose of the paper is to examine the influence of these factors on satisfaction with the overall cultural experience and on perceived ecological, socio-cultural, and economic effects. Additionally, it examines the influence of perceived cultural tourism effects on satisfaction with the overall cultural experience. In addition to its theoretical contribution, this study draws certain practical implications for achieving sustainability in cultural tourism destinations.

The paper is structured in five main parts. The introduction is followed by the conceptual framework where the theoretical background is given and hypotheses are developed. The third section explains the methodology and is followed by a discussion of the results. The last section presents concluding remarks with suggestions for future research.

2. Conceptual framework

2.1 Sustainable marketing in cultural tourism

Conventional marketing has often faced criticism for stimulating irresponsible consumption (Font & McCabe, 2017) and thus has been considered as an opponent to sustainability (Kamper & Ballantine, 2019). As Pomering (2017) explains, one problem may be in the previous definition of marketing that was focused only on the relationship of consumers with the organisation, while neglecting other stakeholders. However, in 2013 a new definition was established by the American Marketing Association, which has directed the marketing conceptualization towards sustainability (Pomering, 2017), and nowadays marketing implies "creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large" (AMA, 2017). Sustainable marketing has emerged as an attempt to encourage organizations to accept the ecological and social limitations, as well as to value continuity over short-term profit (van Dam & Apeldoorn, 1996). According to Rakic and Rakic (2015), sustainable marketing focuses on the social goals of the entire community and on environmental protection.

When it comes to a tourist destination, sustainability has become a crucial element of differentiation that increases its competitiveness (Moral et al., 2018). However, the marketing of cultural tourism faces several sustainability issues. As Donohoe (2012) states, heritage sites have often been criticised as overly commodified, they lack stakeholder collaboration and attract mass tourists, thus overburdening the destination's infrastructure and re-

sources. He goes on to emphasize, however, that when organized properly, sustainable marketing is a beneficial tool for balancing cultural site preservation and tourists' needs. It requires the capital and commitment of all stakeholders, namely national and local governments, organizations, and people (Burkisene et al., 2018).

In the literature on sustainable marketing in tourism, destination management policy and responsible tourism demand appear to be some of the most significant topics. Researchers argue that government policy and destination management are the starting points for destination sustainability (Burkisene et al., 2018; Loulanski & Loulanski, 2018). Policies for sustainable tourism management greatly affect destination competitiveness (Goffi et al., 2019), while the value of cultural tourism often depends on the governance style (Richards, 2018). Thus, this institutional component that closely relates to sustainability (Cucculelli & Goffi, 2016) can be seen as the fourth pillar of sustainable tourism development (Asmelash & Kumar, 2019).

However, as Cucculelli and Goffi (2016) emphasize, tourism is both supply and demand-driven, and the responsible behaviour of tourists should be considered as another sustainability component. Tourists are becoming increasingly aware, which reflects on their destination choice, because the environmental quality of a destination has become one of the main decisive factors (Yaw, 2005). Research shows that, along with their growing concern for sustainability, tourists are willing to pay more for a sustainable product or service (Abzari et al., 2013). Besides the sustainability aspects of tourism demand and destination policies, the specific features related to cultural tourism should not be disregarded, such as tourist respect for cultural heritage (Chui et al., 2011) and the quality of main cultural resources and support services (Howard & Pinder, 2003).

2.2 Cultural experience and satisfaction

From a marketing perspective, a tourist is seen as a consumer who is involved in commercial exchange (Mossberg, 2007). However, unlike conventional products, when buying and consuming a cultural tourism service, tourists do not receive any tangible benefit in exchange for their money. Given that a cultural tourism service is not a material or quantifiable good, the benefits it provides are psychological and appear as a tourist experience (Sigala & Leslie, 2005). Tourist experience can be described as a subjective personal reaction felt during tourism service consumption (Otto & Ritchie, 1996). However, experience is a very complicated psychological process, so many different definitions have emerged (Quinlan Cutler & Carmichael, 2010). Chhetri et al. (2004) state that despite many attempts to define the concept of tourist experience, there is no single theory that could encompass its broadness and complexity. Cultural experience is a vital factor for cultural tourists (Sigala & Leslie, 2005; Domínguez-Quintero et al., 2020) since tourists tend to seek a direct connection with the local history and living culture while traveling (Asmelash & Kumar, 2019).

The relationship between tourist experience and satisfaction is well-established in the literature (Domínguez-Quintero et al., 2020; Nguyen & Cheung, 2016). In the context of tourism, satisfaction can be seen as tourists' overall post-visit evaluation compared to their pre-visit expectations (Asmelash & Kumar, 2019; Gnanapala, 2015; Kotler, 1999). When post-travel experience is lower than pre-travel expectation, dissatisfaction occurs (Oliver, 1980). The utmost goal of tourism for all destinations is achieving tourist satisfaction (Zhan et al., 2018) because it positively influences tourist loyalty (Baker & Crompton, 2000; Yoon & Uysal, 2005) and revisit intention (Alegre & Cladera, 2009; Kozak & Rimmington 2000), and it is a source of competitive advantage (Bagri & Kala, 2015; De Nisco et al., 2015). Additionally, recent studies relate tourist satisfaction with sustainability practices (Asmelash & Kumar, 2019; Awang et al., 2018; Moise et al., 2018). Thus, the following hypothesis is proposed:

H1: CRS marketing factors have a significant influence on satisfaction with the overall cultural experience.

2.3 Cultural tourism effects

Cultural tourism initially represented an alternative form of tourism; however, due to fast growth and increasing commodification, it has gradually turned towards mass development (Jovicic, 2014). Therefore, cultural tourism in many destinations now faces the triple bottom line (TBL) challenge (Du Cros & McKercher, 2020) or even represents a threat to sustainable development (Mousavi et al., 2016), mostly due to its negative environmental impacts (Moliner et al., 2019). Therefore, this issue has lately become of great interest for scholars and practitioners (Cerquetti & Ferrara, 2018; Su et al., 2019).

Nonetheless, various researchers associate cultural tourism with various positive implications for destinations, considering its economic, socio-cultural, and ecological dimensions (Artal-Tur et al., 2018;

Richards, 2018). Cultural tourism can enhance the quality of life of local residents and positively influence environmental preservation (Du Cros & McKercher, 2020). Moreover, multiplied income that cultural tourists generate can be used for cultural heritage preservation (Richards, 2018). Thus, heritage managers increasingly recognize that profitability and sustainability do not exclude, but complement each other (Donohoe, 2012).

There is a growing number of studies observing this issue from the residents' point of view (Muler González et al., 2018; Rasoolimanesh & Jaafar, 2017), while the perspectives of other stakeholders, such as tourists, remain understudied (Kim et al., 2019). Unlike the earlier understanding, the previous research shows that tourists are aware of economic, ecological, and social sustainability issues in destinations, and sustainability consciousness can lead to changes in their preferences (Cottrell et al., 2004; Asmelash & Kumar, 2019). Therefore, the relationship between the aforementioned sustainable marketing factors and tourist perception of cultural tourism effects should be addressed. Accordingly, the following hypotheses are defined:

H2: CRS marketing factors have a significant influence on the perceived ecological effects of cultural tourism.

H3: CRS marketing factors have a significant influence on the perceived social effects of cultural tourism.

H4: CRS marketing factors have a significant influence on the perceived economic effects of cultural tourism.

Studies show that tourist satisfaction is affected not only by tourists' awareness of sustainability but also by the perceived effects of sustainability (Iniesta-Bonillo et al., 2016). Asmelash and Kumar (2019) determined that the perception of social and economic sustainability dimensions has an influence on tourist satisfaction. Furthermore, Moliner et al. (2019) established a relationship between perceived environmental sustainability and tourist satisfaction, indirectly through the tourist experience. Based on that, the following hypothesis is defined:

H5: Perceived cultural tourism effects have a significant influence on tourist satisfaction with the overall cultural experience.

3. Methodology

According to the proposed hypotheses, a quantitative approach was taken. In empirical research, the survey method was applied based on a structured questionnaire. The data were collected through the combination of a personal and online survey on Facebook. The research instrument consisted of three parts. The first part included questions about the respondents' socio-demographic profile (gender, age, level of education, employment status, and income). The second part of the questionnaire included 32 items relating to attitudes regarding the implementation of sustainable marketing in cultural tourism. Four items included in the last part of the questionnaire referred to attitudes about cultural tourism effects and satisfaction with the overall cultural experience. Respondents were asked to indicate how much they agree or disagree with each statement, using a five-point Likert scale (ranging from 1 = I strongly disagree to 5 = I strongly agree).

Items were collected from the previous studies of Cucculelli & Goffi, 2016; Chui et al., 2014; Chui et al., 2011 and Petrić & Ljubica, 2012. Of the 32 items included in instruments relating to sustainable marketing implementation in cultural tourism, 29 items were taken from previous research, and three new items were added (Table A.1 and Table A.2 in the Appendix). In the present study, the classification of items was implemented following Cucculelli and Goffi (2016), who classified factors as sustainability factors and factors not directly related to sustainability. Based on their findings, items were initially classified in the context of cultural tourism as marketing attributes closely related to sustainability (CRS) with 14 items and marketing attributes not closely related to sustainability (NCRS) with 18 items.

The survey was conducted in Croatia during June and July 2020 on a sample of 205 domestic tourists. We used the survey method as a combination of a personal and online survey through Facebook. This sample was chosen considering the present situation caused by the Covid-19 pandemic, where the emphasis is on tourism demand generated by domestic tourists. The sample size can be considered adequate, and it is above the recommended minimum level of at least five observations per variable (Hair et al., 2014). Data analysis was carried out using the statistical software SPSS 23. Exploratory factor analysis (EFA) was applied to extract factors, followed by Principal Component Analysis (PCA). Multiple linear regression analysis was used to test the obtained factors' impact on satisfaction and perceived cultural tourism effects.

4. Results and discussion

4.1 Socio-demographic characteristics of respondents

The structure of respondents by gender shows there are more males (57.07%) than females (42.93%). The majority of the respondents are between 35 and 45 years of age (32.68%); 28.29% of the respondents are aged 26 to 35, and 9.76% are aged 18 to 25. Respondents over the age of 56 account for 10.15%.

More than one-half of the respondents hold graduate university degrees (58.05%), and 47% have secondary school qualifications. 87.80% of the respondents are employed, and 9.76% are students. Regarding the average monthly income, 58.05% of the respondents earn from 5,000 to 10,000 HRK, and 27.80% earn from 3,000 to 5,000 HRK.

4.2 EFA and reliability analysis

In order to delineate perceived dimensions of marketing factors closely related to sustainability (CRS) and marketing factors not closely related to sustainability (NCRS) in cultural tourism, exploratory factor analysis (EFA) and reliability analysis were performed.

The analysis results for CRS marketing factors in cultural tourism are presented in Table 1.

Table 1 Results of factor and reliability analysis for marketing factors closely related to sustainability (CRS) in cultural tourism

Marketing factors closely related to sustainability (CRS)				
Item number	**Item**	**Factor loading**	**Total variance explained (%)**	**Alpha coefficient**
FACTOR 1 – Sustainable destination policy			**61.297**	**0.935**
I14	It is important to me that the destination cares about the implementation of sustainable marketing in cultural tourism.	.848		
I9	It is important to me that the destination monitors the effects of tourism.	.818		
I8	It is important to me that the destination's public sector seeks to minimize tourism's negative social impact.	.769		
I6	When choosing a destination, it's important to me that service providers apply sustainable practices.	.754		
I13	It's important to me that the destination encourages alternative (sustainable) forms of transport.	.736		
I7	It is important to me that the destination's public sector seeks to minimize tourism's negative environmental impact.	.723		
I5	It is essential for me that the hospitality facilities I visit operate following sustainable development principles.	.694		
FACTOR 2 – Propensity for sustainable behaviour			**7.752**	**0.907**
I3	I am willing to pay more for cultural tourism products if it's guaranteed the money goes to preserving the local environment.	.814		
I2	I am willing to participate in sustainable cultural tourism products.	.771		
I1	I am willing to pay more for sustainable cultural tourism products.	.756		
I12	I want to participate in preserving the environment.	.691		
I10	I try to preserve the environment even if it's more expensive and time-consuming.	.670		
I4	I prefer trips that minimally damage the environment.	.638		
I11	I would describe myself as an environmentally conscious person.	.611		
Cumulative total variance explained (%)			**69.050**	

Source: Authors' calculations

The suitability for conducting EFA analysis was determined using the Kaiser-Meyer-Olkin coefficient (0.925; KMO>0.7) and Bartlett's test of sphericity (χ^2 = 2434.301; p<0.001) according to Hair et al. (2014). Upon determining suitability, Principal Component Analysis (PCA) with Varimax rotation was performed to identify the number of dimensions among CRS marketing attributes. Following Hair et al. (2014), factors were considered acceptable, providing the eigenvalue was greater than 1, the total variance explained was greater than 60%, and factor loading was above 0.5. EFA results generated a CRS marketing construct with a two-factor structure with eigenvalues above 1: Factor 1 – *Sustainable destination policy*, and Factor 2 – *Propensity for sustainable behaviour*. Total variance explained by the two factors accounted for 69.050%. The scale's internal consistency for each component is confirmed by Cronbach's alpha coefficients (>0.70), as recommended by Hair et al. (2014).

Based on the criteria mentioned above, the results are also calculated for NCRS marketing factors in cultural tourism (Table 2).

Table 2 Results of factor and reliability analysis for marketing factors not closely related to sustainability (NCRS) in cultural tourism

Marketing factors not closely related to sustainability (NCRS)				
Item number	**Item**	**Factor loading**	**Total variance explained (%)**	**Alpha coefficient**
FACTOR 1 – Respect for cultural heritage			**60.260**	**0.951**
I3	I believe in the benefit of maintaining the authentic atmosphere of the destination.	.837		
I1	I believe in the benefits of preserving cultural heritage.	.830		
I2	I believe in the benefits of maintaining distinctive city streets.	.827		
I4	I believe in the benefit of being part of a community rich in culture and history.	.813		
I7	I respect residents in the destination.	.773		
I6	I respect local customs and the destination's tradition.	.760		
I5	I believe in the benefit of sharing cultural heritage with visitors.	.753		
I9	Promotion of cultural heritage will introduce tourists to the destination's important socio-cultural characteristics.	.671		
I8	The implementation of cultural heritage in the tourist offer will encourage its protection and promotion.	.645		
FACTOR 2 – Servicescape			**8.439**	**0.933**
I17	It is important to me that the destination is dedicated to education related to tourism and hospitality.	.786		
I18	The quality of communal infrastructure is important to me.	.785		
I14	The quality of transport infrastructure is important to me.	.769		
I12	It is important to me that the natural resources in the destination are preserved.	.758		
I16	It is important to me that the destination encourages the cooperation of and partnerships between public and private stakeholders.	.758		
I11	It is important to me that the environment in the destination is preserved.	.756		
I13	It is important to me that the cultural resources in the destination are preserved.	.693		
I15	It is important to me that the community participates in destination tourism.	.669		
Cumulative total variance explained (%)			**68.698**	

Source: Authors' calculations

The Kaiser-Meyer-Olkin coefficient (0.901; KMO>0.7) and Bartlett's test of sphericity (χ^2 = 4138.996; p<0.001) show the suitability for carrying out factor analysis. PCA with Varimax rotation was performed. Item 10 with a factor loading lower than 0.50 was removed from further analysis. The EFA results generated a NCRS marketing construct with a two-factor structure with eigenvalues above 1: Factor 1 – *Respect for cultural heritage*, and Factor 2 – *Servicescape*. Total variance explained by the two factors accounted for 68.698%. Cronbach's alpha coefficients for each component confirm the scale's reliability (>0.70).

4.3 Multiple linear regression analysis

Multiple linear regression analysis was used to determine the impact of CRS and NCRS marketing factors on satisfaction with the overall cultural experience. In the multiple regression analysis, two CRS marketing factors and three NCRS marketing factors were taken as independent variables and satisfaction with the overall cultural experience as the dependent variable. Satisfaction with the overall cultural experience was measured with the item: "Tourists are satisfied with the overall cultural experience in Croatia." (M=3.54, SD=0.819). The results are shown in Table 3.

Table 3 Multiple regression analysis for marketing variables affecting satisfaction with overall cultural experience

Independent variable					
CRS marketing factors	B	SE	BETA	t	Sig.
Constant	2.976	.275		10.810	.000
Sustainable destination policy	-.042	.014	-.314	-2.958	.003
Propensity for sustainable behaviour	.060	.015	.423	3.992	.000
R^2	0.074				
Adjusted R^2	0.065				
Standard error	0.792				
F ratio	7.981				
Significance	0.000				
NCRS marketing factors					
Constant	2.309	.324		7.122	.000
Respect for cultural heritage	.033	.012	.278	2.669	.008
Servicescape	-.022	.013	-.015	-.140	.889
R^2	0.071				
Adjusted R^2	0.062				
Standard error	0.794				
F ratio	7.741				
Significance	0.001				

Source: Authors' calculations

The regression analysis results for CRS marketing factors indicate a statistically significant influence (p<0.05) on tourist satisfaction with the overall cultural experience, and, accordingly, hypothesis *H1* was confirmed.

The results imply that *Propensity for sustainable behaviour* positively contributes to satisfaction with the overall cultural experience. However, *Sustainable destination policy* with a negative β coefficient does not enhance tourist satisfaction. These results support some recent suggestions that destinations should be aware of the interaction issues between tourists and cultural attractions when forming the outcome and perceptions of visitors regarding

their tourist experience (Artal-Tur et al., 2018) and should employ new sustainable tourism practices (Goffi et al., 2019; Asmelash & Kumar, 2019), based on an understanding of the role of tourists in creating a sustainable destination policy and on an understanding of sustainable tourist behaviour.

Among NCRS factors, only *Respect for cultural heritage* shows a statistical significance (p=0.008) and contributes positively to satisfaction with the overall cultural experience (β=.278). A negative and not significant contribution to tourist satisfaction is evident with regard to *Servicescape* (β=-.140, p=.0889).

In the context of perceived effects, we employed multiple regression analysis to determine the influence of CRS and NCRS marketing factors on perceived cultural tourism effects.

Table 4 shows the results for the impact of CRS marketing factors on perceived effects in cultural tourism.

Table 4 Multiple regression analysis for CRS marketing factors affecting perceived effects in cultural tourism

Independent variable	**Ecological effects**				
CRS marketing factors	B	SE	BETA	t	Sig.
Constant	2.195	.292		7.528	.000
Sustainable destination policy	.008	.015	.058	.544	.587
Propensity for sustainable behaviour	.034	.016	.225	2.127	.035
R^2	0.074				
Adjusted R^2	0.065				
Standard error	0.840				
F ratio	6.008				
Significance	0.001				
	Social effects				
	B	SE	BETA	t	Sig.
Constant	1.720	.292		5.895	.000
Sustainable destination policy	-.012	.015	-.081	-.820	.413
Propensity for sustainable behaviour	.083	.016	.511	5.195	.000
R^2	0.204				
Adjusted R^2	0.196				
Standard error	0.840				
F ratio	25.650				
Significance	0.000				
	Economic effects				
	B	SE	BETA	t	Sig.
Constant	2.475	.307		8.065	.000
Sustainable destination policy	-.010	.016	-.064	-.610	.542
Propensity for sustainable behaviour	.059	.017	.366	3.508	.001
R^2	0.102				
Adjusted R^2	0.093				
Standard error	0.884				
F ratio	11.402				
Significance	0.000				

Source: Authors' calculations

The results reveal that CRS marketing factors were statistically significant for estimating perceived effects in cultural tourism. CRS marketing factors explain a total of 20.4% variance of social effects (R^2=0.204), 10.2% variance of economic effects (R^2=0.102), and 7.4% variance of ecological effects (R^2=0.074). The main CRS marketing predictor of perceived cultural tourism effects is the *Propensity for sustainable behaviour* (PSB) for all perceived effects. As PSB has the strongest positive and significant influence on social effects (β=.511, p=0.000), hypothesis *H2* is confirmed. Based on the influence of PSB on economic effects (β=.366, p=0.001), hypothesis *H3* is confirmed. Hypothesis *H4* is confirmed by the positive and significant influence of PSB on ecological effects (β=.225, p=0.035). These findings are supported by Chafe's (2005, as cited in Budeanu, 2007) research results, which indicate that tourists have high concerns about a holiday's eco-social components.

The results calculated for the influence of NCRS marketing factors are presented in Table 5.

Table 5 Multiple regression analysis for NCRS marketing factors affecting perceived effects in cultural tourism

Independent variable	**Ecological effects**				
NCRS marketing factors	B	SE	BETA	t	Sig.
Constant	1.996	.342		5.840	.000
Respect for cultural heritage	.010	.013	.083	.806	.421
Servicescape	.029	.014	.216	2.087	.038
R^2	0.081				
Adjusted R^2	0.072				
Standard error	0.836				
F ratio	8.897				
Significance	0.000				
	Social effects				
	B	SE	BETA	t	Sig.
Constant	1.271	.344		3.697	.000
Respect for cultural heritage	.038	.013	.286	2.964	.003
Servicescape	.027	.014	.190	1.973	.050
R^2	0.201				
Adjusted R^2	0.193				
Standard error	0.842				
F ratio	25.363				
Significance	0.000				
	Economic effects				
	B	SE	BETA	t	Sig.
Constant	1.757	.350		5.021	.000
Respect for cultural heritage	.029	.013	.216	2.179	.030
Servicescape	.029	.014	.206	2.074	.039
R^2	0.156				
Adjusted R^2	0.148				
Standard error	0.857				
F ratio	18.726				
Significance	0.000				

Source: Authors' calculations

NCRS marketing factors explain 20.1% of the total variance of social effects (R^2=0.201), 15.6% of economic effects (R^2=0.156), and 8.1% of ecological effects (R^2=0.081). It is evident that *Servicescape* has a positive and significant influence on ecological (β=.216, p=0.038) and economic (β=.206, p=0.039) effects, while *Respect for cultural heritage* positively and significantly influences social (β=.286, p=0.003) and economic (β=.216, p=0.030) effects.

Based on the findings that economic, social, and environmental factors affect trip satisfaction (Jarvis et al., 2016), multiple regression analysis was applied to determine the impacts of the perceived effects on tourist satisfaction with the overall cultural experience. Effects were measured with the following items: "Cultural tourism in Croatia has positive ecological effects" (M=3.34, SD=0.868), "Cultural tourism in Croatia has positive social effects" (M=3.67, SD=0.937), and "Cultural tourism in Croatia has positive economic effects" (M=3.84, SD=0.928). The results are presented in Table 6.

Table 6 Multiple regression analysis of the impacts of the perceived effects on satisfaction with the overall cultural experience

Effects	B	SE	BETA	t	Sig.
Constant	1.501	.223		6.743	.000
Ecological	.012	.075	.012	.156	.877
Social	.287	.084	.328	3.430	.001
Economic	.246	.074	.278	3.328	.001
R^2	0.325				
Adjusted R^2	0.315				
Standard error	0.678				
F ratio	32.314				
Significance	0.000				

Source: Authors' calculations

The findings indicate that the perceived effects are significant in estimating tourist satisfaction with the overall cultural experience and explain a total of 32.5% variance of tourist satisfaction (R^2=0.325). The perceived values of two cultural tourism effects: social (β=.328, p=0.001) and economic (β=.278, p=0.001), have significant and positive impacts on tourist satisfaction with the overall cultural experience. The present study's findings support the results of Aydin & Alvarez (2016, as cited in Asmelash & Kumar, 2019), indicating that economic and socio-cultural sustainability pulls more visitors than ecological sustainability. Asmelash & Kumar (2019) also found that socio-cultural sustainability was the strongest predictor of tourist satisfaction, followed by economic sustainability. Based on these findings, hypothesis *H5* is confirmed.

Ecological effects have a positive but not significant influence (β=.156, p=0.877) on tourist satisfaction with the overall cultural experience. According to these findings, results from a previous study of Asmelash & Kumar (2019) imply that ecological effects are not a significant predictor of tourist satisfaction.

5. Conclusion

Culture has become a key tourism product in the international tourism market (Artal-Tur et al., 2018). The emergence of the sustainability issue stems from the fact that cultural heritage as the main cultural tourism resource is irreproducible, and it often becomes banalized, while the visitor/resident ratio in cultural destinations is growing (Caserta & Russo, 2002). Given the recent cultural tourism sustainability concerns and insufficient research on the subject, this research attempts to expand the knowledge on the relationship of sustainability marketing factors in cultural tourism from a tourist perspective. This study contributes to the literature by providing insights into the influence of sustainable marketing factors on satisfaction with

the overall cultural experience and their impact on perceived ecological, social, and economic effects in cultural tourism. The research concept in this article, together with the proposal of marketing factors closely related to sustainability (CRS) and not closely related to sustainability (NCRS) in a cultural tourism context, provides new insights into marketing theory and encourages further research.

The findings in this article can serve as a guideline for marketing managers regarding sustainability in cultural tourism. Thus, several implications for managers can be drawn. Managers must be aware of the importance of marketing sustainability factors and their contribution to achieving customer satisfaction. A propensity for sustainable behaviour as a marketing variable positively contributes to satisfaction with the overall cultural experience. In cultural tourism, marketing managers and decision-makers must give special attention to sociocultural effects as the strongest predictors of tourist satisfaction with the overall cultural experience.

This study has some limitations. The data were collected through a combination of a face-to-face and an online survey. Since the research was conducted during the Covid-19 pandemic, the sample is relatively small. For future research, it is suggested to expand the sample and distribute the questionnaire through multiple channels. Finally, the research instrument could be expanded with additional items related to the importance of sustainable marketing implementation for tourists.

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Appendix

Table A.1 Marketing attributes closely related to sustainability in cultural tourism (CRS)

No.	Taken and adopted items	Original model determinants	Authors
I1	I am willing to pay more for sustainable cultural tourism products.	Concern for responsible tourism	Chui et al. (2014)
I2	I am willing to participate in sustainable cultural tourism products.		
I3	I am willing to pay more for cultural tourism products if it's guaranteed the money goes to preserving the local environment.		
I4	I prefer trips that minimally damage the environment.	Willingness to pay tourist	
I5	It's essential for me that the hospitality facilities I visit operate following sustainable development principles.		
I6	When choosing a destination, it's important to me that service providers apply sustainable practices.		
I7	It's important to me that the destinations' public sector seeks to minimize tourism's negative environmental impact.	Sustainable tourism policy and destination management	Cucculelli & Goffi (2016)
I8	It's important to me that the destinations' public sector seeks to minimize tourism's negative social impact.		
I9	It's important to me that the destination monitors the effects of tourism.		
I10	I try to preserve the environment even if it's more expensive and time-consuming.	Environmental responsible behaviour	Chui et al. (2011)
I11	I would describe myself as an environmentally conscious person.		
I12	I want to participate in preserving the environment.		
I13	It's important to me that the destination encourages alternative (sustainable) forms of transport.	Added items	
I14	It's important to me that the destination cares about the implementation of sustainable marketing in cultural tourism.		

Source: Authors

Table A.2 Marketing attributes not closely related to sustainability in cultural tourism (NCRS)

No.	Taken and adopted items	Original model determinants	Authors
I1	I believe in the benefits of preserving cultural heritage.	Respect and preservation of cultural heritage	Chui et al. (2011)
I2	I believe in the benefits of maintaining distinctive city streets.		
I3	I believe in the benefit of maintaining authentic destinations' atmosphere.		
I4	I believe in the benefit of being part of a community rich in culture and history.		
I5	I believe in the benefit of sharing a cultural heritage with visitors.	Culturally Significant Tourist	Chui et al. (2014)
I6	I respect local customs and the destination's tradition.	Memorable experience seeking tourist	
I7	I respect residents in the destination.		
I8	The implementation of cultural heritage in the tourist offer will encourage its protection and promotion.	Functions of ICH	Petrić & Ljubica (2012)
I9	Promotion of cultural heritage will introduce tourists to important socio-cultural destinations' characteristics.		
I10	It's positive and useful for tourists to know the destination's socio-cultural characteristics because it reduces possible tensions between them and residents.		
I11	It's important to me that the environment in the destination is preserved.	Quality of environmental and natural resources	Cucculelli & Goffi (2016)
I12	It's important to me that the natural resources in the destination are preserved.		
I13	It's important to me that the cultural resources in the destination are preserved.	Historical and artistic sites	
I14	The quality of transport infrastructure is important to me.	General infrastructure	
I15	It's important to me that the community participates in destination tourism.	Sustainable tourism policy and destination management	
I16	It's important to me that the destination encourage the cooperation and partnerships of public and private stakeholders.		
I17	It's important to me that the destination is dedicated to education related to tourism and hospitality.		
I18	The quality of communal infrastructure is important to me.	Added item	

Source: Authors

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ATTITUDES AND PERCEPTIONS OF SUSTAINABLE MARKETING IN HIGHER EDUCATION – DESIGNING A MEASUREMENT INSTRUMENT

Abstract

Purpose: The purpose of this paper is to demonstrate the process of designing the measurement instrument that captures attitudes and perceptions of manifest forms of sustainable marketing in higher education in order to gain an insight into the way of how each selected group of higher education stakeholders perceive and understand the concept and the meaning of sustainable marketing.

Methodology: In order to gain new knowledge, primary research was conducted on a purposive sampling of experts, where 104 valid and complete answers from selected stakeholders related to higher education were received. Quantitative analysis of the collected data was then applied, using descriptive statistics methods and procedures for determining the instrument's dimensionality, validity and reliability.

Results: After the exploratory factor analysis, the multidimensional structure of the proposed measurement instrument of sustainable marketing in higher education was determined, which meets all the given scale validity criteria.

Conclusion: This research has formed a valid measurement instrument of sustainable marketing in higher education of statistical and theoretical significance, which can be used for further research, development and validation.

Keywords: Sustainable marketing, higher education, measurement instrument, scale development

1. Introduction

Sustainability has become a movement that is gaining more and more influence in recent times, so sustainable development became a mandatory paradigm today. The concept of sustainable marketing evolved from the concept of green marketing and the economy of sustainable development. Sustainable marketing implies balancing that includes integrated economic, environmental and social goals. It is therefore considered as a broad management concept that satisfies multiple stakeholders simultaneously. Higher education institutions (HEIs) have great potential for the development and application of sustainable marketing as a prerequisite for creating and enhancing their competitiveness, while achieving three goals: economic, environmental and social. Sustainable marketing is both a macro and a micro concept whose initial elements

include the analysis of consumer behaviour and current socio-environmental problems in general. The main stakeholders of HEIs are not only students as customers, but also faculties, employers, society, government and the local community. The fundamental role of HEIs is to produce knowledge and innovations and to contribute to the social, economic and environmental challenges (Stephens et al., 2008). By providing the necessary knowledge and incorporating the environmental approach HEIs contribute to the development of stakeholders' capacities and skills for the successful implementation of environmental strategies (Papadas et al., 2017). Regarding the role of higher education, there is still confusion about what exactly sustainable development means, what sustainable development should look like and how to bring a change in organizational culture (Adams et al., 2018; Velazquez et al., 2006).

Since the empirical research on sustainable marketing is limited (Press et al., 2011) and a scarce body of scientific literature focusing on sustainable marketing in higher education sector is published, proposing no applicable measurement scales, this research was applied to fill this gap. There is a need for developing a measurement instrument that captures attitudes and perceptions of manifest forms of sustainable marketing in higher education to examine an insight into how each selected group of higher education stakeholders perceive and understand the concept and the meaning of sustainable marketing. Hence the research problem of this paper is how to properly define a measurement instrument for quantitative research on sustainable marketing in HEIs. It seeks to gain an insight into how members of selected HEI's stakeholder groups view and understand the areas of sustainability and sustainable marketing in higher education.

In order to determine the attitudes and perceptions of key stakeholders on sustainable marketing and its application on HEIs, we started developing and testing a measuring instrument for comprehensive quantitative research that could provide conclusions on the perception and application of sustainable marketing at the University of Rijeka.

This paper is structured as follows: after the introduction, the theoretical and conceptual background discussing sustainability, sustainable marketing and sustainable marketing in HEIs introduces the empirical part of the paper, which describes the process of developing the proposed measurement instrument, sampling and data collection, and instrument's purification and validation. Lastly, we present the obtained results and finalise with the conclusion pointing out the objectives achieved, the research limitations and suggestions for further research.

2. Theoretical and conceptual background

Researchers have demonstrated an interest in the field of sustainability in higher education (Mitra, 2009; Nicolescu, 2009; Camino & Ayala, 2010; Ma & Todorovic, 2011; Warwick, 2016) and in marketing concepts such as social, economic, environmental and sustainability marketing (Stephens et al., 2008; Abou-Warda, 2014; Shiel et al., 2016; Adams et al., 2018).

2.1 Sustainability and sustainable marketing

Sustainability has been recognized as one of the major issues in marketing strategy (Hoffman, 2002; Annamalai et al., 2018), as well as a key factor of innovation (Edwards, 2005; Dangelico & Vocalelli, 2017), and a relevant topic affecting organizational market performance and stakeholders' involvement (Reilly & Hynan, 2014). Bridges and Wilhelm (2008) defined sustainable marketing as a holistic, integrative approach that involves economic, social and environmental aspects when developing marketing strategies. Thus, sustainability encompasses marketing approaches: economic (Camino, 2007; Closs et al., 2011; Leal Filho et al., 2019), social (Link, 2007), environmental (Bacow & Moomaw, 2007; Hawken et al., 2000; Thompson & Creighton, 2007; Chard et al., 2013; Annamalai et al., 2018), and sustainability marketing (Nidumolu et al., 2009; Chabowski et al., 2011; Abou-Warda, 2014). Some authors argue that companies must have the ability to take the necessary actions to create new ways of producing goods and services that will provide a higher quality of life by minimizing both the use of natural resources and their environmental impact (Almeida, 2002; Montenegro de Lima et al., 2020).

Marketing is focused on meeting consumer's desires and needs (Soares et al., 2019), it represents a social activity, an organizational role and a process for creating, communicating, and adding value to stakeholders for the benefit of all (Keefe, 2004; Kuo & Smith, 2018). Some studies point to the lack of dialog with stakeholders and their inclusion in decision-making processes and emphasise the necessity

to develop and establish an integrative approach (Lozano et al., 2013; Leal Filho et al., 2019) to overcome this gap. Thus, there is a need to act integrative when considering the strategic dimensions of sustainability (Disterheft et al., 2013; Berchin et al., 2017). Marketing actions are also needed for the internal organization which is essential for the successful implementation of marketing activities (Sarquis et al., 2020).

2.2 Sustainable marketing in Higher Education Institutions (HEIs)

Universities worldwide face a major challenge in responding to rapid changes in the market environment (Ma & Todorovic, 2011; Aleixo et al., 2018). These changes have pressured HEIs to adopt market-oriented initiatives (Mitra, 2009). Looking back at the not-so-distant past, many HEIs considered sustainability as an unnecessary additional cost (Hawken et al., 2000; Hoffman & Henn, 2008), but nowadays, HEIs show strong support and commitment to sustainability that has been implemented in their ethical and responsible mission, goals and other activities (Guerra et al., 2018; Lima et al., 2020). In order to achieve sustainability goals, HEIs need to define strategic actions to achieve sustainability and a measurement framework for institutional success during the implementation process (Casarejos et al., 2017; Finnveden et al., 2020). HEIs' managers need to explore and develop a range of sustainable strategies to provide knowledge that can help address contemporary sustainability challenges and raise environmental awareness (Thomashow, 2014). It is interesting to note that legislative requirements are consolidated when HEIs get involved in the issue of environmental sustainability and when they support legal norms and raise community awareness (Grubba et al., 2017). Some authors recommend that HEIs should be more actively involved in the dialogue with internal and external stakeholders, regarding the institutional sustainability achievement (Soares et al., 2019), and environmental responsibility expectations (Zahid et al., 2018). The commitment of HEIs to sustainable development can be shown through their participation and engagement in social progress around the world. HEIs present themselves as leading authorities in building a world aimed at this goal (Fuchs et al., 2020).

HEIs should be a key actor in promoting sustainable development, having the opportunity to educate the future leaders and actively participate in facing a number of challenges (Xiong et al., 2013; Beynaghi et al., 2016). The products specifically related to HEIs are their educational services, research projects, courses, and other programs (Sarquis et al., 2020). HEIs can have a great impact on promoting sustainability by paying special attention to encouraging students to adopt sustainable practices and to become more environmentally concerned and friendly (Steiner & Posch 2005; Merkel & Litten 2007; Beynaghi et al., 2016). It also has a direct impact on local communities since HEIs are responsible for the creation and flow of scientific knowledge and other important information (Sachs, 2008; Fuchs et al., 2020). Investing in research and education to contribute to the development of a better educated society is one of the main objectives of HEIs (Gholami et al., 2015; Yuan et al., 2013; Guerra et al., 2018).

3. Methodology

This section of the paper describes the process of designing the "Sustainable marketing in higher education" (SMHE) measurement instrument, which was supposed to be developed to capture the attitudes and perceptions of HEIs' stakeholders' towards manifest forms of sustainable marketing in higher education.

3.1 Developing the SMHE measurement instrument

Consistent with Bearden's and Netemeyer's (1999) considerations for marketing research measurement instrument creation, development and evaluation, the root framework for items aggregation was established by constructs' theoretical outlines and descriptions, as an imperative to adequately capture their theoretical domains. The initial set of items that was generated by adapting existing and creating new items based on prior theoretical and empirical research subject to sustainable higher education, education for sustainable development, and sustainable marketing (Abou-Warda, 2014; Ajzen, 1991, 2002; American Management Association, 2007; Ferdous, 2010; Gaebel et al., 2018; Hillman & Keim, 2001; Jamrozy, 2007; Jaworski & Kohli, 1996; Little, 2006; Mrnjaus, 2008; Rončević & Rafajac, 2012; Rončević et al., 2008; Sidiropoulos & Sibley, 2013; Siu Noel & Wilson, 1999; Stern et al., 1995; United Nations' General Assembly, 2015), was pre-checked by five marketing academics following the suggestions for scale development pro-

cedures (Lewis et al., 2005; DeVellis, 2003; Gerbing & Anderson, 1988) to confirm the initial pool of items implicate all essential and relevant components subject to sustainable marketing in higher education, thus confirming the measurement instrument's content validity. Subsequently, a convenient sample of 20 students was engaged for pilot testing and items refinement according to Hill (1998) and Bearden & Netemeyer (1999) to check the items' adequacy and for measurement instrument's improvement and purification.

Following the precursory section with demographic variables, the questionnaire administered respondents' attitudes towards higher education activities contributing to sustainable development, personal beliefs, attitudes and norms towards sustainable marketing in higher education and the potential benefits of its implementation. Respondents were asked to express the level of their accordance with the proposed 48 items administering the subjects' research interest, by selecting corresponding offered values on the Likert-type scale, ranging from 1 (completely disagree) to 7 (completely agree).

3.2 Sampling and data collection

Given the lack of precedent research with respect to sustainable marketing in higher education, in order to obtain new insights, primary research was conducted on a purposive sampling of experts according to the recommendation of Kumar et al. (2013). During the last three weeks of April 2019, data was collected using an anonymous, structured self-administered online questionnaire using Google Docs Forms, distributed by e-mail to the total number of 225 stakeholders (university employees, students, local government and other private and public business entities).

After two reminders, a total of 118 responses were collected, 14 unusable or incomplete ones were excluded, so that the response rate was 46.22% and the analyses were conducted on the responses of 104 questionnaires. From the total number, 64.42% (67) were female respondents whose mean age was 42 years and 37 (35.58%) were male, whose mean age was 44 years. 22 respondents (21.15%) have the highest level of university education i.e. university postgraduate doctoral or postgraduate specialist degree or equivalent, more than half of the total number of respondents (63 or 60.58%) have a university degree equivalent to a master's degree or equivalent and 19 (18.27%) have a lower level of education (i.e. bachelor's degree or high school).

Since there is no consensus on the sample size adequacy for factor analyses, authors' recommendations range from 50 (de Winter et al., 2009) for statistically significant results for a small number of factors with high factor loadings, up to 500 respondents (Comerey & Lee, 1992, as cited in MacCallum et al., 1996). According to Hair et al. (2010), who recommend a minimum adequate sample size of 100, it was concluded that this condition has been met.

3.3 Measurement instrument purification and validation

The main objective of this stage of the measurement instrument development process was to refine the initial pool of items and to divert them according to the content review in order to create a valid measurement instrument of sustainable marketing in higher education to be used for further research. Consequently, 48 questionnaire items measured on a 7-point Likert-type scale, with codes ranging from SM2 to SM49 were included in the further analysis as theoretically and conceptually determined and suitable to the subject of the authors' research focus. The proposed instrument's psychometric characteristics were thus evaluated and its internal consistency and scale reliability were analysed.

To examine the construct validity and reduce the initial number of items and to test the underlying dimensions of the construct, using Statistical Package for Social Sciences (SPSS 23.0), the Exploratory Factor Analysis (EFA) using Principal Components Analysis (PCA) with Varimax rotation was conducted as the most suitable since there was no intercorrelation found among the items (Hair et al., 2010). EFA was applied as a convenient method according to Mejovšek (2013) to classify the manifest variables of the construct, aiming to determine its fundamental factors since the factor structure was not already known from previous studies.

The EFA involved initial reliability tests using item communalities with a cutting point value of 0.5 and Kaiser-Meyer-Olkin Measure (KMO) greater than 0.6 to test the suitability of the data for structure detection (Hair et al., 2010). The results of the EFA demonstrate a high KMO value of 0.794 with Bartlett's Test of Sphericity statistically significant ($\chi 2=7189.40$ at $p<0.01$), indicating the suitability of the data for

structure detection, since they were not unrelated. The Cronbach's alpha value for the initial 48-item measurement instrument was 0.822, which is above the recommended minimum of 0.7 (Hair et al., 2010), demonstrating good reliability (DeVellis, 2003).

In the process of EFA authors indicated 25% of items as unreliable, since having communalities extracted (CE) values below the acceptable value of 0.4, factor loadings below 0.5, factor loadings above 0.3 on more than one factor and loading the "wrong" factor (Hair et al., 2010), i.e. items SM2, SM6, SM7, SM9, SM12, SM13, SM14, SM15, SM36, SM37, SM40 and SM41. Accordingly, the final 36-item SMHE measurement instrument was found to be convenient for further study.

Table 1 Exploratory factor analysis of SMHE measurement instrument

Communalities		Rotated Factor Matrix[a]			
Item	**Initial**	**Item**	**1**	**2**	**3**
SM3	**0.669**	SM3	**0.589**	0.026	-0.098
SM4	**0.762**	SM4	**0.681**	0.011	0.117
SM5	**0.792**	SM5	**0.625**	0.212	0.264
SM8	**0.506**	SM8	**0.518**	0.120	0.290
SM10	**0.862**	SM10	**0.571**	0.231	0.141
SM11	**0.793**	SM11	**0.547**	0.194	0.248
SM16	**0.830**	SM16	0.122	**0.606**	0.234
SM17	**0.891**	SM17	-0.216	**0.718**	0.132
SM18	**0.784**	SM18	0.191	**0.727**	0.111
SM19	**0.749**	SM19	-0.015	**0.624**	0.269
SM20	**0.878**	SM20	0.051	**0.784**	0.184
SM21	**0.910**	SM21	0.122	**0.796**	0.298
SM22	**0.836**	SM22	0.232	**0.740**	0.125
SM23	**0.844**	SM23	0.154	**0.741**	0.256
SM24	**0.886**	SM24	0.139	**0.784**	0.168
SM25	**0.906**	SM25	0.231	**0.761**	0.215
SM26	**0.934**	SM26	0.145	**0.730**	0.272
SM27	**0.889**	SM27	0.236	**0.710**	0.123
SM28	**0.899**	SM28	0.136	**0.726**	0.226
SM29	**0.880**	SM29	0.243	**0.721**	0.144
SM30	**0.844**	SM30	0.141	**0.681**	0.232
SM31	**0.941**	SM31	0.247	0.154	**0.693**
SM32	**0.944**	SM32	0.104	0.128	**0.736**
SM33	**0.872**	SM33	0.241	0.145	**0.715**
SM34	**0.792**	SM34	0.154	0.041	**0.696**
SM35	**0.913**	SM35	0.261	0.150	**0.817**
SM38	**0.816**	SM38	0.236	-0.065	**0.591**
SM39	**0.912**	SM39	0.134	0.021	**0.788**
SM42	**0.943**	SM42	0.245	0.103	**0.747**
SM43	**0.940**	SM43	0.125	0.189	**0.737**
SM44	**0.943**	SM44	0.293	0.241	**0.815**
SM45	**0.861**	SM45	0.271	0.229	**0.823**
SM46	**0.919**	SM46	0.293	0.201	**0.823**
SM47	**0.891**	SM47	0.222	0.135	**0.773**
SM48	**0.885**	SM48	0.235	0.186	**0.738**
SM49	**0.836**	SM49	0.295	0.249	**0.645**

Source: Authors' calculations

Following analyses of 36-items data suitability demonstrate a high KMO value of 0.897 with the Bartlett's Test of Sphericity statistically significant ($\chi 2=4403.61$ at $p<0.01$). Although the results demonstrate the instrument at a nascent stage, the three-factor statistically and theoretically acceptable solution was generated after 8 iterations, with Eigenvalues greater than 1 and the total variance explained of 65.35% (with factor 1 loading 37.23% variance explained, factor 2 19.17% and factor 3 explaining 8.93% of total variance). A high total scale's Cronbach's alpha of 0.894, with subscale values ranging from 0.796 to 0.979 which are acceptable for further analysis (Hair et al., 2010), demonstrate the reliability and content validity of the proposed SMHE measurement instrument, as shown in Table 2.

Table 2 SMHE measurement instrument's reliability analysis

Item	Construct/Measure	Cronbach's alpha	Cronbach's alpha if item deleted	Item-to-total correlation
Promotion and education for sustainable development (PESD)		**0.859**		
SM3	Improving the entire higher education system's quality		0.856	0.541
SM4	Improving continuous professional development and training of all employees engaged in the higher education system		0.847	0.546
SM5	Implementation of mutual elective courses on sustainable development		0.834	0.645
SM8	Implementation of study programs on sustainable development		0.856	0.751
SM10	Promotion of sustainable development principles through own business practices		0.835	0.868
SM11	Reporting about own endeavours and achievements in accordance to sustainable development		0.838	0.680
Sustainable marketing activities (SMA)		**0.979**		
SM16	Promotion of new ideas that contribute to acceptance and implementation of sustainability as a lifestyle and business philosophy		0.978	0.773
SM17	Concern about environmental and societal long-term benefits while striving to achieve own business goals		0.961	0.600
SM18	Partnership with regional and local government bodies		0.906	0.502
SM19	Partnership with competitors		0.979	0.630
SM20	Partnership with economic entities		0.977	0.599
SM21	Partnership with the local community		0.978	0.709
SM22	Adjusting business processes to laws and legal regulations while striving to achieve own business goals		0.863	0.644
SM23	Concern about all employees while striving to achieve own business goals		0.797	0.645
SM24	Dialogue with key stakeholders (employers, students, prospective students, parents of students, employees, higher education institutions, scientific institutions, relevant ministries, local and regional government bodies and society at large)		0.844	0.763
SM25	Anticipating and respecting the needs of broader community and future generations		0.792	0.704

Item	Construct/Measure	Cronbach's alpha	Cronbach's alpha if item deleted	Item-to-total correlation
SM26	Regularly considering the impacts of own business decisions on various members of stakeholders (employers, students, potential students, parents of students, employees, higher education institutions, scientific institutions, relevant ministry, local and regional government bodies), on natural and financial resources and society at large		0.856	0.625
SM27	Increasing the application of modern information and communication technology (ICT) in business processes and teaching methods		0.725	0.794
SM28	Increasing the availability of formal, informal and non-formal education to all stakeholders		0.888	0.774
SM29	Transparency and availability of data on own activities taken that contribute to the society at large and on efforts being taken to reduce the negative impact on the environment		0.978	0.853
SM30	Acceptance, implementation and application of the principles of sustainable development as an essential part of business culture, at all levels and all aspects of business		0.978	0.720
Implementation benefits (IB)		**0.796**		
SM31	Rationalising usage of resources		0.791	0.778
SM32	Increasing efficiency		0.744	0.790
SM33	Creating added value for users while taking into account long-term interests of both society and environment		0.719	0.788
SM34	Creating and achieving competitive advantage		0.754	0.800
SM35	Improving business performance		0.739	0.815
SM38	Increasing study success		0.795	0.755
SM39	Increasing the visibility of higher education institution		0.794	0.743
SM42	Intensifying internal and external mobility of students and employees		0.701	0.742
SM43	Simultaneous achievement of environmental, societal and economic goals		0.764	0.774
SM44	Promoting new ideas about sustainability as a new paradigm and as a lifestyle that leads to sustainable development of entire society		0.753	0.736
SM45	Creating the change we want to testify as a society at large		0.725	0.654
SM46	Increasing ethics and morality, availability and transparency of business, procurement and donation data		0.709	0.750
SM47	Education for sustainable development		0.720	0.758
SM48	Increasing loyalty and satisfaction of users and other stakeholders		0.765	0.676
SM49	Adapting existing and/or creating new study programmes		0.790	0.661

Source: Authors' calculations

4. Results

The EFA of the statistically significant and theoretically convenient set of 36 items determined three factors of the SMHE construct, named according to the attributable items and the area of interest they operationalise. Since all factors have more than 3 attributable items needed to give it a meaningful interpretation (Henson & Roberts, 2006), the authors named them at this stage of the inductive, theoretical, and subjective process (Pett et al., 2003) as follows.

The first factor generated which included 6 items considering the topic of educational and encouraging activities contributing to sustainable development was named "Promotion and education for sustainable development – PESD" (Cronbach's Alpha 0.859). The second factor containing 15 items capturing manifest forms of sustainable marketing activities and practices in higher education was named "Sustainable marketing activities – SMA" (Cronbach's Alpha 0.979) and lastly, the third factor determined by 15 items that accessed personal beliefs, attitudes and norms about potential advantages, contributions and benefits of sustainable marketing practices in higher education was named "Implementation benefits – IB" (Cronbach's Alpha 0.796).

5. Conclusion

The aim of this paper was to design a measurement instrument that captures attitudes and perceptions of manifest forms towards sustainable marketing in higher education in order to gain insight into higher education stakeholders' understanding and perceptions of the concept and meaning of sustainable marketing. The measurement instrument's content validity, dimensionality and reliability was confirmed and after the exploratory factor analysis, the multidimensional structure of the proposed measurement instrument of sustainable marketing in higher education was determined. The resulting three-dimensional scale encompasses promotion and education for sustainable development, sustainable marketing activities and implementation benefits, which meets all the given scale validity criteria. Due to the lack of prior research studies on sustainable marketing in higher education that outlined the fundamental purpose of this exploratory research, the results obtained could not be accordingly compared but can serve as a starting point for further studies in the same scope of the research topic. While this research has formed a valid measurement instrument of sustainable marketing in higher education of statistical and theoretical significance, the authors, aware of its limitations that may have impacted the results and conclusions, suggest the proposed measurement instrument to be employed to a larger sample size that includes a wider range of population profiles for further research, measurement instrument's improvement, development and validation.

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THE IMPORTANCE OF A COMPANY'S CAPITAL STRUCTURE IN FINANCIAL RELATIONS: THE DYNAMIC PANEL MODEL

Abstract

Purpose: The main objective of this research was to determine the impact of capital structure on the profitability of Croatian companies. The second objective was to analyze the consistency of the way in which capital structure is managed with respect to the existing theories of capital structure.

Methodology: A survey was conducted on the sample of Croatian companies for the period from 2009 to 2019 using panel model GMM estimation. In order to be included in the sample, all shares listed on the Zagreb Stock Exchange were considered which meet the liquidity criterion and are part of the non-financial sector. Accordingly, the sample consists of 30 shares.

Results: The research established a significant relationship between capital structure and profitability, with a negative sign. With these results, Croatian companies are placed alongside other companies from countries that belong to the group of developing countries, and diametrically opposed to the results obtained for the markets of developed countries. Indirectly, the validity of theories of capital structure formation on the Croatian market was tested, and it was proved that the behavior of Croatian companies can best be described by settings of the trade-off theory of capital structure.

Conclusion: For Croatian companies, this means that any further use of debt will lead to a decline in profitability. Consequently, this means that domestic companies cannot make significant use of the current situation of low interest rates on loans, and therefore they lag behind in terms of the level of investments made.

Keywords: Capital structure, financial relations, panel model GMM estimation, Croatia

1. Introduction

The importance of a company's capital structure is a concept that has been at the focus of research for many years by many scientists and practitioners because of its impact on the overall performance of the company. This research will cover capital structure of companies in the Republic of Croatia and try to determine its relationship with profitability indicators. It will also try to provide an answer to the question about a degree of harmonization of the

Croatian capital market and other capital markets of more developed countries of the European Union. With its current position as a country in the process of adopting the euro as its own currency, plenty of research has been devoted to analyzing a degree of harmonization of monetary policies. What has been observed is a lack of research into a degree of harmonization of financial and capital markets.

The term "harmonization of financial and capital markets" means the compatibility of market cycles in Croatia and developed countries of the European Union. Such coherence is important because it depends on whether the EU's economic policy instruments will equally benefit all members of the Union, regardless of the level of development of their financial markets. The importance of financial markets derives from its functions, and in terms of research conducted here, from the function of raising capital outside the banking system. With different combinations of financing sources, a company is able to actively manage its exposure to financial risk, and consequently the cost of financing, which is directly dependent on the level of indebtedness. Looking at a company as an entity with the primary financial goal of maximizing the wealth of its shareholders, the cost of financing is a significant variable in meeting that goal. Apart from the obvious influence which the cost of financing has on the financial result of the company, its significance is even deeper, and it is expressed by the influence on the investment policy of the company. Namely, in the methods for assessing financial profitability of investments, the rate of the total cost of financing (calculated as the weighted average cost of capital) represents the limit for accepting or rejecting investment projects. At a macroeconomic level, this has repercussions on the level of employment, i.e. unemployment of an economy, as well as on the GDP of the economy.

Considering all the above, it is our opinion that, due to its importance, the study of a company's capital structure must be the subject of continuous analysis. Moreover, a further increase in financial flows between the countries of the European Union raises the question of their harmonization. In that sense, the research presented here will indirectly test the existence and validity of various theories about the formation of capital structure. A significant degree of capital market harmonization should be reflected in the similar behavior of companies listed on national stock exchanges, which use different sources of financing. This would mean that on the sample of Croatian companies, we should find evidence of behavior in accordance with the characteristics of the same theories of capital structure formation as is the case in developed countries.

Bearing all this in mind, the main goal of the research conducted here is to determine the impact of capital structure on the level of profitability of the analyzed Croatian companies. A scientific contribution was achieved by using a dynamic panel model that was not previously used either in the analyzed sample or in the analyzed time period in Croatia. The secondary goal of the research is to test the validity of various existing theories on the formation of capital structure in order to determine a degree of harmonization of the financial markets in the EU and Croatia.

Taking into account the goal of the research itself, the article is organized as follows. After this introductory part, there follows a section that presents the main characteristics of the existing theories of capital structure formation. Within all of the theories, elements are presented that have, or do not have, an impact on the formation of the degree of indebtedness, all with the aim of achieving optimal capital structure. The next section provides an overview of previous empirical studies testing capital structure theories, as well as the results obtained in relation to the relationship between capital structure and the profitability of companies. After that, there follows a section in which this relationship is empirically tested on the sample of companies in the Republic of Croatia, and the obtained results are interpreted. The article finishes with a concluding discussion and a list of references.

2. The relationship between capital structure and financial performance of the company

Determining the relationship between capital structure, or different levels of debt utilization, and financial performance of the company is the subject of numerous studies. Ever since the historical work of Modigliani and Miller (1958) opposing their thinking about the irrelevance of capital structure to its traditional understanding, capital structure has been the subject of research by many scholars and practitioners seeking to adapt capital structure of their companies in search of an optimal structure. In doing so, optimal capital structure can be

defined as the one that will result in the lowest weighted average cost of capital, and thus the maximum value of such company.

The search for optimal capital structure has resulted in a number of theories that, each in its own way, seek to define how to achieve such optimal structure. All known capital structure theories can illustratively be divided into two groups:

- traditional, rational theories; and
- modern, behavioral theories.

The first group includes theories that approach the problem of determining capital structure from a quantitative aspect, trying to determine optimal capital structure through various calculations. Apart from the fact that in most cases they start from the assumption of a perfect market, they also start from the assumption of rational behavior of investors. This group of theories includes the traditional theory, the Modigliani-Miller theory and the trade-off theory of capital structure.

The traditional theory starts from the hypothesis that there is a direct interdependence of capital structure and the value of a company according to the level of financial risk to which the firm is exposed (Durand, 1952). The higher the share of debt in the sources of finance, the higher the financial risk of the company, and thus the lower the perceived value of the company. That is expressed by a decrease in the market price of shares, i.e. by an increase in the required rate of return of investors on securities issued by a company. A significant feature of the theory is the speed with which owners and creditors react to changes in the financial risk of the company. Namely, for creditors, the coefficient of reaction to financial risk is significantly higher than the coefficient of reaction of owners. As a consequence of such relationships, the theory implies that an increase in the degree of indebtedness will reduce the total cost of financing to a certain limit (due to cheaper debt financing) after which they begin to grow. The very point at which total costs are lowest is the required optimal capital structure (Asaf, 2004, p. 32).

The basic Modigliani-Miller theory of the capital structure irrelevance sets as its initial hypothesis the claim that capital structure has no influence on the market value of the company (Modigliani & Miller, 1958). Namely, in conditions of a perfect market, equity and debt securities are perfect substitutes, and the value of a company does not depend on their ratio but on the realized profit and the degree of risk exposure expressed through the financing cost rate (McMenamin, 2000, p. 456). Unlike this first version of the theory, further work by Modigliani and Miller focuses on getting their model closer to reality, including taxes that had not been considered until then (Modigliani & Miller, 1963). Taking into account taxes, capital structure is no longer an irrelevant item; on the contrary, it becomes very significant. However, a still limited view on the significance of capital structure results in the conclusion that the use of debt as a source of finance creates a tax shelter, while neglecting the degree of financial risk. In this regard, Modigliani and Miller concluded that optimal capital structure consists entirely of debt because in that case the value of the tax shelter would also be maximal. With such capital structure, the total cost of financing would be the lowest, and consequently the value of the company would be maximal.

The trade-off theory of capital structure solves the problem of the Modigliani-Miller theory with taxes included by confronting the tax shelter with the cost of financial troubles (Kraus & Litzenberger, 1973; Kim, 1978) and the agency cost (Jensen & Meckling, 1976; Myers, 1977), which reduce the company value while increasing the level of debt. Taking into account the investors' income tax (Miller, 1977), as well as other forms of tax savings besides debt (DeAngelo & Masulis, 1980), the trade-off theory makes such relationship more complex, but more realistic.

The second group of theories on the formation of capital structure consists of those theories that take into consideration some of the elements of behavioral finance, i.e. psychological elements. In this way, these theories deviate from the assumptions of a perfect market, but also from the assumption of investor's rationality, which in many ways makes them closer to reality. At the same time, the quantitative approach to capital structure is not the focus of these theories either. This group includes the signaling theory and the pecking-order theory.

The signaling theory of capital structure rejects the assumption of a perfect market for information symmetry in an attempt to explain capital structure in terms of equity and debt securities issues as a "signal" by which a company indicates expectations of future financial results (Ross, 1977; Leland & Pyle, 1977). In this sense, the issue of debt securities

is interpreted as a positive signal of the expected future financial result from which it will be possible to settle the interest liability on the securities issued. In contrast, the issue of equity securities on the market will be interpreted as a negative signal of the current overvaluation of the company's shares and the questionable achievement of a positive financial result in the future. Considering this interpretation of signals, it follows that the determination of optimal capital structure is secondary. The method of capital structure formation, and thus the degree of indebtedness, depends primarily on the available investment projects and their profitability.

The pecking-order theory has its starting point in the results of a practical study on capital structure management, where certain patterns of company management behavior in obtaining the preferred sources of funding are identified (Myers, 1984; Myers & Majluf, 1984). Such a hierarchy of preferred sources of funding is made in accordance with the psychological characteristic of a man who will always prefer to "follow the line of least resistance". In accordance with this deviation from the assumption of rational investor behavior, company management will primarily use retained earnings as a source of finance. If they are not sufficient to finance all investment opportunities, the use of debt financing instruments will be approached, while the use of equity securities is the least desirable source of finance because it requires most effort, time and additional costs for the company. As a result of all the above, capital structure is only a reflection of past preferences in choosing the sources of finance and investment options available to the company, while determining optimal capital structure is secondary.

3. Empirical research review

As expected, there is a difference in the results of research conducted in developed capital markets compared to those obtained from emerging markets. Thus, for example, Graham and Harvey (2001) present the results of a comprehensive study conducted in 1999 of US companies from the Fortune 500 list. They found some support for the pecking-order and the trade-off theory of capital structure, but little evidence that companies are concerned about asset substitution, asymmetric information, transaction costs, free cash flows, or personal taxes. Similar results are obtained by Gill et al. (2011) who analyzed US companies for the period 2005-2007. Rajan and Zingales (1995) and Bancel and Mittoo (2004) did the same on a sample of G7 and sixteen developed European economies, respectively, and found evidence consistent with the results obtained for the USA, i.e. they confirmed the results in support of the pecking-order and the trade-off theory. La Porta et al. (1997) and La Porta et al. (1998) compared determinants of capital structure, financing methods and dividend policy in 49 countries within the legal and institutional environment. Highlighting the results of their research related to the issues explored in this article, it can be concluded that those countries that have a more developed legal environment have a stronger capital market.

Examining the connection between capital structure and the profitability of companies in the UK, contradictory but, to some extent, complementary results can be singled out. Namely, analyzing a sample of 30 companies from the FTSE-100 index of the London Stock Exchange for the period 2005-2014, Nasimi (2016) found evidence to confirm the prevailing behavior of British companies according to the assumptions of the trade-off theory. Thus a positive significant relationship was found between the degree of indebtedness and profitability measured by the ROE indicator, and at the same time, a negative significant relationship was found between profitability measured by ROA and ROIC indicators. Exploring the same issues for SMEs in the UK market for the period 1998-2008, Abeywardhana (2015) found that the link between capital structure and profitability is significantly negative. This would mean that SMEs do not take advantage of financial leverage because of the fear of losing control.

Similar results were obtained for France, Greece, Italy and Portugal by Psillaki and Daskalakis (2009), who researched SME companies in the period from 1997 to 2002. They also established a negative relationship between capital structure and the profitability of the company, and a positive relationship between the size of the company and capital structure.

These differences in the obtained results could also be attributed to the fact that these research studies were conducted on the examples of companies from the SME sector. However, Herciu and Ogrean (2017) conducted a comprehensive survey of the world's 100 most profitable companies in 2016 according to the Global Fortune 500 list. Through the analysis of the relationship between capital structure and the profitability of the companies measured by the ROE indicator for 59 non-financial and

big companies from that list, they came to conflicting conclusions about the relationship of these variables depending on the industry to which the specific company belongs. Namely, both low and high levels of the debt-to-equity ratio can result in high levels of ROE, which indicates the problem of determining optimal capital structure. This situation suggests that determining optimal capital structure is a task at the level of each individual company and that it is difficult to explicitly determine whether any of the existing theories of capital structure holds true. This is in agreement with the well-known fact that the market value of company securities is no longer correlated with financial performance of the issuing company, but that those securities almost have "their own life". At its core, this separation of the "securities life" from the "issuing company's life" is a characteristic of contemporary behavioral theories of capital structure.

Investigating the empirical research results for emerging markets, which are the closest to the behavior of developed markets is India, in the period from 1995 to 2008, the formation of a company's capital structure was confirmed to be in accordance with the pecking-order and the trade-off theory (Chakraborty, 2010). Furthermore, exploring the recent period from 2008 to 2017, Pal Singh and Bagga (2019) found a significant positive relationship between capital structure and profitability indicators of Indian companies. Bauer (2004) obtained the same result in terms of confirming theories of capital structure by analyzing data for companies in the Czech Republic for the period from 2000 to 2001.

Other research studies conducted in developing countries demonstrate more or less similar results. Thus, for example, Habimana (2014) conducted research on a large number of companies from Africa, the Middle East, Asia, Eastern Europe, Russia and China, and found evidence in favor of the trade-off theory and a significant negative relationship between capital structure and company profitability. A negative relationship between the capital structure and profitability indicators was also proven in a survey of companies in Romania for the period 2003-2010 (Vătavu, 2015), in Turkey for the period 2005-2012 (Nassar, 2016), in Ghana for the period 1998-2002 (Abor, 2005), in Macedonia for the period 2002-2011 (Ferati & Ejupi, 2012), in Croatia for the period 2009-2018 (Učkar, 2020), to name but a few.

4. Methodology, data and results

Since the main objective of this research is to determine the impact of capital structure on the profitability of Croatian companies, two dynamic panel data models using the GMM (Generalized Method of Moments) technique are estimated. Dynamic panel models have several advantages in relation to static panel models since they tend to be more properly specified and because the dynamics are placed in the estimated part of the model and not within the error term that invalidates fixed or random effects estimation. As confirmed by the experiment, Brañas-Garza, Bucheli and García-Muñoz (2011) showed that the use of dynamic panel data models in the context of experiments allows us to unravel new relationships between experimental variables and highlighting new paths in behavior. In addition, in relation to other methods such as OLS, fixed effects or generalized effects methods, the dynamic panel GMM specification avoids the endogeneity problem arising from a causal relationship between independent and dependent variables using instrumental variables generated by lagged variables (Trad et al., 2017). Furthermore, it allows the estimation of consistent parameters even when time series are short. This method was initially proposed by Arellano and Bond (1991) and further developed by Arellano and Bover (1995) and Blundell and Bond (1998). The initial estimator is usually called the difference GMM, whereby the system GMM estimator was developed.

The linear dynamic panel model can be presented as (Wooldridge (2002), Baltagi (2005) and IHS Global Inc. (2019)):

$$Y_{it} = \sum_{j=1}^{p} \rho_j Y_{it-j} + X_{it}'\beta + \delta_i + \varepsilon_{it}, \quad i = 1, 2,\ldots, M; t = 1, 2,\ldots, T \ , \tag{1}$$

where Y_{it} is a dependent variable of i (individuals) in t (period of time), ρ_j are j-th order autocorrelation coefficients, where , Y_{it-j} are lags of a dependent variable, where , X_{it} is a vector of regressors of i (individuals) in t (period of time), β is a vector of coefficients, δ_i is the individual effect (individual heterogeneity) and ε_{it} are the error terms.

By first-differencing equation (1), the individual effect can be eliminated producing the following equation which can be estimated by using GMM techniques:

$$\Delta Y_{it} = \sum_{j=1}^{p} \rho_j \Delta Y_{it-j} + \Delta X_{it}'\beta + \Delta \varepsilon_{it} \quad , \qquad (2)$$

where Δ denotes a difference operator.

GMM estimation of (2) may include a different number of instruments for each period along with the period-specific instruments corresponding to different numbers of lagged dependent and predetermined variables available at a given period.

If ε_{it} are not autocorrelated, the optimal GMM weighting matrix for the differenced specification estimated by White period covariance and used in the Arellano-Bond two-step estimator can be shown as:

$$H = (M^{-1} \sum_{i=1}^{M} Z_i' \Delta \varepsilon_i \Delta \varepsilon_i' Z_i)^{-1} \quad , \qquad (3)$$

where H is a weighting matrix, Z_i contains a mixture of strictly exogenous and predetermined instruments, Δ denotes difference operator and ε_{it} are the error terms.

Before estimating the models, the first step in this research involves the determination of a representative sample of shares from the Zagreb Stock Exchange (2020) database in the period from 2009 to 2019. The shares are selected on the basis of the share liquidity criterion, where shares of the financial sector (banks and insurance companies) whose financial structure is formed in accordance with some other principles are excluded from the representative sample. All shares listed on the Zagreb Stock Exchange were considered for the sample, which meet the liquidity criterion, i.e. they were traded at least once a week during the analyzed period. The final sample for both models consists of unbalanced (since data for some years are missing) 330 annual observations of selected company level data. The selected company shares are presented in Table 1.

Table 1 Companies included in the sample

Ticker	*Company*	*Ticker*	*Company*
ADPL	AD Plastik d.d.	LRH	Liburnia Riviera hoteli d.d.
ADRS	Adris grupa d.d.	LRHC	FTB turizam d.d.
ARNT	Arenaturist d.d.	MAIS	Maistra d.d.
ATGR	Atlantic grupa d.d.	MDKA	Medika d.d.
ATLN	Excelsa nekretnine d.d.	OPTE	OT – Optima telekom d.d.
ATPL	Atlantska plovidba d.d.	PLAG	Plava laguna d.d.
DDJH	Đuro Đaković holding d.d.	PODR	Podravka d.d.
DLKV	Dalekovod d.d.	PTKM	Petrokemija d.d.
ERNT	Ericsson Nikola Tesla d.d.	RIVP	Valamar riviera d.d.
HT	Hrvatski Telekom d.d.	THNK	Tehnika d.d.
IGH	Institut IGH d.d.	TPNG	Tankerska next generation d.d.
INA	INA – Industrija nafte d.d.	ULPL	Uljanik Plovidba d.d.
INGR	Ingra d.d.	VART	Varteks d.d.
KOEI	Končar-elektroindustrija d.d.	VIRO	Viro tvornica šećera d.d.
KRAS	Kraš d.d.	VLEN	Brodogradilište Viktor Lenac d.d.

Source: Zagreb Stock Exchange (2020)

Further analysis implies financial ratio calculation from the company's audited and consolidated financial statements. The calculation of financial ratios is presented in Table 2. The return on assets (ROA) and the return on equity (ROE) are related to a company's profitability, while the debt ratio, the financing ratio and the long-term balance are related to a company's capital structure. These variables were selected in accordance with comparable research analyzed in the review of previous empirical research.

Table 2 Financial ratio calculation

Return on assets (ROA)	(net profit – preferred dividends) / total assets
Return on equity (ROE)	(net profit – preferred dividends) / equity
Debt ratio (LEV)	(total liabilities – capital and reserves) / total assets
Financing ratio (FIN)	(total liabilities – capital and reserves) / equity
Long-term balance (LTB)	long-term assets / (long-term liabilities + capital and reserves)

Source: Žager et al. (2009, p. 251)

Based on equation (2), the first panel model fits the return on assets (ROA) to the debt ratio (LEV), the financing ratio (FIN) and the long-term balance (LTB), while the second model fits the return on equity (ROE) to the debt ratio (LEV), the financing ratio (FIN) and the long-term balance (LTB). Both models include two lags of the dependent variable (ROA or ROE) as explanatory variables, the debt ratio, the financing ratio and the long-term balance as regressors altogether with period dummy variables. A transformation, i.e. the first difference of each variable in the regression, is applied to remove the cross-section fixed effects, while period dummy variables are included as untransformed. With regard to the dependent variable (ROA or ROE), the Arellano-Bond type dynamic panel (predetermined) instruments include all valid lags, and a list of other instruments in the transformed equation consists of the debt ratio, the financing ratio and the long-term balance. The Arellano-Bond 2-step estimator is computed by using the 2-step method. Finally, the GMM weighting matrix uses the White period weights, and the coefficient covariance method is based on the ordinary estimates.

Descriptive statistics are presented in Table 3.

Table 3 Descriptive statistics

	ROA	*ROE*	*LEV*	*FIN*	*LTB*
Mean	-0.001514	0.066903	0.571753	5.805058	1.035833
Median	0.017043	0.053702	0.513396	2.030556	0.981992
Maximum	0.223626	8.526554	2.108646	67.83492	15.99315
Minimum	-0.491436	-5.658025	0.057816	0.099532	-7.958199
Std. Dev.	0.090792	1.034672	0.305018	10.38968	1.243522
Observations	317	317	317	317	317

Source: Authors' calculations

It can be seen that the mean value of ROA was negative during the observed period. On the other hand, the lowest value of standard deviation, as a classical measure of risk, was achieved by ROA.

To avoid potential problems with multicollinearity between variables, the correlation coefficients are estimated and presented in Table 4.

Table 4 Correlation coefficients

	ROA	*ROE*	*LEV*	*FIN*	*LTB*
ROA	1				
ROE	0.60	1			
LEV	-0.54	-0.41	1		
FIN	-0.09	0.25	0.35	1	
LTB	-0.11	-0.06	0.01	-0.08	1

Source: Authors' calculations

The results in Table 4 show that the absolute value of correlation coefficients between independent variables are below 0.7, indicating the absence of multicollinearity (Kervin, 1992). The results of the first model are presented in Table 5.

Table 5 Dependent variable: ROA

Dependent variable: ROA				
Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***
ROA(-1)	0.074722	0.029414	2.540354	0.0118
ROA(-2)	-0.230539	0.015899	-14.50000	0.0000
LEV	-0.370855	0.069160	-5.362247	0.0000
FIN	0.004173	0.001682	2.481042	0.0139
LTB	-0.001710	0.001590	-1.075295	0.2835
@LEV(@ISPERIOD("2012"))	-0.008279	0.007730	-1.071042	0.2854
@LEV(@ISPERIOD("2013"))	0.025479	0.004889	5.211575	0.0000
@LEV(@ISPERIOD("2014"))	-0.018174	0.004103	-4.429056	0.0000
@LEV(@ISPERIOD("2015"))	0.025751	0.004631	5.561082	0.0000
@LEV(@ISPERIOD("2016"))	-0.001017	0.004762	-0.213619	0.8310
@LEV(@ISPERIOD("2017"))	-0.009084	0.009200	-0.987358	0.3246
@LEV(@ISPERIOD("2018"))	-0.008570	0.007278	-1.177529	0.2403
@LEV(@ISPERIOD("2019"))	0.035462	0.008794	4.032495	0.0001
Specification of effects				
Cross-section fixed (first differences)				
Period fixed (dummy variables)				
Root MSE	0.088013	Mean dependent var.		0.000465
S.D. dependent var.	0.100132	S.E. of regression		0.090647
Sum squared resid.	1.758410	J-statistic		20.36183
Instrument rank	30	Prob(J-statistic)		0.256142
Arellano-Bond serial correlation test				
Test order	*m-Statistic*	*rho*	*SE(rho)*	*Prob.*
AR(1)	-2.505651	-0.678269	0.270696	0.0122
AR(2)	-0.491483	-0.053597	0.109052	0.6231

Source: Authors' calculations

The GMM estimator requires first-order serial correlation, but no second-order autocorrelation. The Arellano-Bond serial correlation test indicates that the model passes the test of first- and second-order serial correlation in the disturbances. *J*-statistic and the accompanying *p*-value indicate that over-identifying restrictions are valid. Overall tests suggest that the model is consistent, without heteroscedasticity or autocorrelation problems. An insight into *t*-statistics and accompanying *p*-values indicates that all variables are statistically significant, with the exception of the long-term balance. The debt ratio affects ROA negatively, meaning that a rise in the debt ratio decreases a company's profitability. On the other hand, although the coefficient is small, the financing ratio affects ROA positively, meaning that a rise in the financing ratio increases a company's profitability. Although not shown, the Wald test for joint significance of period dummy variables confirms their significance (p=0.0000).

The results of the second model are presented in Table 6.

Table 6 Dependent variable: ROE

Dependent variable: ROE				
Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
ROE(-1)	-0.121058	0.019010	-6.368152	0.0000
ROE(-2)	-0.204528	0.016014	-12.77172	0.0000
LEV	-0.806365	0.416270	-1.937119	0.0540
FIN	-0.028021	0.006605	-4.242505	0.0000
LTB	-0.019765	0.014391	-1.373389	0.1711
@LEV(@ISPERIOD("2012"))	-0.131594	0.019609	-6.710732	0.0000
@LEV(@ISPERIOD("2013"))	0.191942	0.037140	5.168119	0.0000
@LEV(@ISPERIOD("2014"))	-0.074977	0.051093	-1.467471	0.1437
@LEV(@ISPERIOD("2015"))	0.266419	0.060215	4.424499	0.0000
@LEV(@ISPERIOD("2016"))	-0.189431	0.023169	-8.176046	0.0000
@LEV(@ISPERIOD("2017"))	-0.051468	0.036789	-1.398998	0.1633
@LEV(@ISPERIOD("2018"))	0.035843	0.023730	1.510455	0.1324
@LEV(@ISPERIOD("2019"))	0.144807	0.053218	2.721039	0.0070
Specification of effects				
Cross-section fixed (first differences)				
Period fixed (dummy variables)				
Root MSE	0.913287	Mean dependent var.		0.034740
S.D. dependent var.	1.075710	S.E. of regression		0.940618
Sum squared resid.	189.3393	J-statistic		15.40432
Instrument rank	30	Prob(J-statistic)		0.566384
Arellano-Bond serial correlation test				
Test order	*m-Statistic*	*rho*	*SE(rho)*	*Prob.*
AR(1)	-2.578739	-78.505055	30.443199	0.0099
AR(2)	-0.732641	-12.330606	16.830348	0.4638

Source: Authors' calculations

As before, the Arellano-Bond serial correlation test indicates that the model passes both tests for serial correlation. *J*-statistic and the accompanying *p*-value indicate that over-identifying restrictions are valid. Overall tests suggest that the model is consistent, without heteroscedasticity or autocorrelation problems. As with the previous model, an insight into *t*-statistics and accompanying *p*-values indicates that all variables are statistically significant, with the exception of the long-term balance. All variables negatively affect ROE, meaning that a rise in each variable decreases a company's profitability. Although not presented, the Wald test for joint significance of period dummy variables reveals their significance ($p = 0.0000$).

5. Interpretation of the obtained results

The results obtained in both models are consistent with the results of related research conducted in emerging markets. Namely, in all analyzed research studies there is a significant relationship between capital structure and profitability indicators. In this study, this is shown in Table 5 and Table 6, where the coefficients associated with variables representing capital structure (i.e. LEV, FIN or LTB) almost always take on a significant negative sign regard-

less of whether ROA or ROE is taken as a profitability indicator. According to the results obtained here, there is a diametric difference in relation to the markets of developed countries, where such a relationship has mostly a positive sign.

Further analysis of the obtained results can be directed toward determining the conformity of the formation and management of the sources of funding in accordance with the assumptions of the existing theories of capital structure. However, it should be noted that the research was not primarily focused on proving the existing theories. Nevertheless, from the obtained results one can indirectly draw a conclusion which of the existing theories have not been proven. These are the theories that in their basic considerations start from the hypothesis that there is no relationship between the sources of finance (capital structure) and the value of a company. Here, a logical assumption is made that the value of a company is affected by the achieved profitability.

Since the research proved the relationship between capital structure and a company's profitability, and thus its value, it can be concluded that in the Croatian capital market no evidence was found in favor of Modigliani-Miller's theory of capital structure irrelevance (a tax-free version), the signaling theory and the pecking-order theory. It is not possible to confirm the validity of Modigliani-Miller's theory with taxes included, since then optimal capital structure would be one that is fully financed by debt (due to the maximum tax shelter). As the mean value of the total debt level (LEV) for sample companies is still at an acceptable and normal level of 57%, and any further increase in the debt level leads to a further decrease in corporate profitability, and to the rejection of this theory of capital structure as well.

The described movement of the degree of indebtedness, as well as the description of implications of a further increase in the level of debt, can be best illustrated in accordance with the settings of the trade-off theory. According to this theory, optimal capital structure is achieved at a certain level of debt at which the total cost of financing is minimal, meaning that the value of the company is maximal. Such optimal structure is at some degree of debt that is greater than 50%, as suggested by the traditional approach to capital structure, but still lower than 100%, as suggested by Modigliani-Miller's theory of capital structure irrelevance with taxes included.

Considering all the facts established so far regarding the relationship between a company's capital structure and profitability, it can be concluded that the Croatian capital market belongs to the group of emerging markets. Namely, the obtained results confirm the same negative relationship between the level of debt and profitability of the company, as well as the most probable determination of capital structure in accordance with the settings of the trade-off theory. Both elements are supported by numerous examples of previous research studies on emerging markets. Such results differ from those obtained for developed markets. The difference is not so much important in terms of a valid theory of capital structure, as it is in the relationship between capital structure and profitability which is positive in developed countries.

What does such difference mean in the context of the harmonization of financial relations for capital markets in EU countries? The monetary policy of the European Central Bank, and in general of other central banks in developed countries, is moving in the direction of cheap money and low interest rates. Such a situation is in favor of further borrowing by companies that see cheap loans as an opportunity to increase investments. In accordance with the positive relationship between the level of indebtedness and profitability for developed countries, such an increase in debt leads to an increase in a company's profitability and market value of its shares, and at the macrolevel to GDP growth, unemployment reduction and economic growth in general. So, we can see that there is a significant degree of alignment of monetary policy and capital markets of developed countries, which certainly contributes to meeting the basic economic goals of these countries.

The situation in emerging markets is diametrically opposed. Because the relationship between debt utilization and corporate profitability is negative, companies operating in developing countries do not benefit from the current low interest rates. Any further increase in the level of debt leads to a decrease in profitability, and the rest of the causal relationship is reversed from the previously described. Thus, it can be concluded that there is a significant differential factor between the capital markets of developing countries and the developed capital markets of the "original" countries of the European Union.

6. Conclusion

As the main goal of the research conducted here was to determine the relationship between a company's capital structure and profitability. The secondary goal was to determine the consistency of the way in which capital structure is managed with respect to the existing theories of capital structure. The conducted research established a significant relationship between capital structure and profitability of companies in the Republic of Croatia, with a negative sign. This result is in line with the results of other research studies conducted in emerging markets, but diametrically opposed to the results obtained for the markets of developed countries, where such a relationship has a positive sign.

Regarding the secondary goal, the research indirectly found that in forming and managing the level of indebtedness, Croatian companies do not follow the principles of the traditional approach to capital structure, the Modigliani-Miller theory, the signaling theory, and the pecking-order theory. What has been established, however, is that the behavior of Croatian companies in terms of capital structure management, can best be explained by the settings of the trade-off theory. According to this conclusion, this research is comparable to similar surveys of companies in countries that belong to the group of developing countries. In contrast, in developed countries, mostly the pecking-order theory and the already mentioned trade-off theory have been proven.

Such results are expected, and they once again show a weak degree of harmonization of financial markets of developed and developing countries. In the context of the countries that make up the EU, this is a problem for the introduction of a common economic policy. This research identified different corporate behavior with regard to the financing of investment opportunities in the current situation of low interest rates. Although different intentions have been identified in groups of countries, this problem certainly deserves a more detailed attention, so future research could be directed toward this area.

This primarily refers to the need for further research on the impact that the European Union's economic policy adopted at the global level may have on companies in Croatia, considering the results of this research. Namely, the diametrically opposite effects that the currently low interest rate has on the decline in profitability of Croatian companies, i.e. the increase in profitability of companies from developed EU countries, pose a serious obstacle to further unification of EU countries in terms of forming a common economic policy.

Finally, this study has some limitations. The Croatian capital market is still underdeveloped with a small number of listed companies and available financial instruments that ultimately affect market liquidity, create large fluctuations in stock prices and lead to yield instabilities. All this is reflected in the company's financial performance indicators. In addition, the estimated period is relatively short. Despite the shortcomings, this analysis can serve as a good starting point for future research regarding the importance of capital structure in financial relations of Croatian companies.

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MODELING STOCK MARKET VOLATILITY IN CROATIA: A REAPPRAISAL

Abstract

Purpose: In this paper, the volatility of the Croatian stock market index CROBEX is investigated using the GARCH(1,1) model.

Methodology: The novelty provided by this paper is the estimation of the GARCH(1,1) model by using three conditional error distributions (normal (Gaussian) distribution, Student's-distribution with fixed degrees of freedom and generalized error distribution (GED) with fixed parameters).

Results: The findings obtained in the research are in the line with previous research in this field (Erjavec & Cota, 2007; Sajter & Ćorić, 2009). The volatility of CROBEX returns is positively correlated with the volume of trade on the Zagreb Stock Exchange and movements on the main European and American stock markets. The movement of S&P 500 stock market index returns is transmitted from the previous day, providing signals for the direction of change of CROBEX index returns in the present.

Conclusion: Therefore, this paper provides evidence that investors in Croatia strongly rely on the past information received from the American S&P500 stock market index. Furthermore, there seems to exist the co-movement between CROBEX and main European indexes on the same trading day.

Keywords: Stock market volatility, GARCH (1,1), American and European stock markets, Croatia

1. *Introduction*

Stock market volatility refers to a measure of dispersion around the mean return of a security on the stock market. Volatility is often associated with the swings in the value of stock or index in either direction. More volatile assets are often considered much riskier than less volatile ones. Too much volatility on the market means uncertainty which is not good for the investor. In this paper, the volatility of the Croatian stock market index CROBEX will be investigated. The novel paper in the field of modelling stock price volatility in Croatia is attributed to Erjavec and Cota (2007). The authors constructed GARCH models for the period from 4 January 2000 to 31 December 2004, following the hypotheses that the volatility of CROBEX returns in the short run depends on the volume of traded stocks on the Zagreb Stock Exchange (ZSE) and the co-movement effects with the main European and American indexes. Since there was a strong ARCH effect detected in all proposed models, GARCH(1,1) specification was chosen to be applied in all models. The volume of trade proved to be a significant explanatory variable as well as two European indexes

(DAX and FTSE100) indicating the existence of contemporaneous co-movement effects between CROBEX and the aforementioned indexes over the same trading day. On the other hand, the predictive GARCH model, including only explanatory variables lagged by one day, pointed to the conclusion that the direction of movements on the American stock markets from the previous day transmitted signals in the direction of change of the CROBEX index in the present.

Sajter and Ćorić (2009) came to similar conclusions. Investors on the Croatian stock market dominantly rely on movements of American indexes, which was especially apparent at the beginning of the World Financial Crisis in October 2008. The co-movements between Croatian and American indexes were explained by the following three concepts: global factors, contagion and irrational escalation. By using a copula GARCH approach, Dajčman (2013) investigated the dependence between the returns on the Croatian and five European stock markets. The basic conclusion was that the dependence between the Croatian and European stock markets is dynamic and can be captured by dynamic normal or symmetrized Joe-Clayton copula GARCH models. Dedi and Škorjanec (2017) provided evidence of co-movement of equity returns, volatility persistence and spillovers in selected Central and Southeast European countries in the period from 2011 to 2017. These findings also highlighted the potential for closer and more intense collaboration between the selected markets. Arnerić and Škrabić Perić (2018) investigated cross-sectional dependence between CEE emerging markets. The results indicated a strong presence of the Monday effect in both mean and variance equations. On the other hand, the Tuesday effect was present only in the mean equation. Škrinjarić (2020) applied the GM-GARCH model to the Croatian stock market. The GM-based model was found to be superior compared to its counterpart.

The goal of this paper is to estimate stock market volatility in Croatia using the GARCH(1,1) model. The methodology of the paper is based on Erjavec and Cota (2007) by specifying the conditional mean equation and conditional mean variance. The novelty in the paper is the use of conditional error distributions. Commonly used conditional error distributions are normal (Gaussian) distribution, Student's -distribution with fixed degrees of freedom and generalized error distribution (GED) with fixed parameters. All three conditional error distributions were estimated in the paper. The models incorporate both factor and predictive elements taking into account lagged explanatory variables. A one-day lagged specification was applied in the predictive GARCH model referring to variables representing the returns of American stock market indexes (Dow Jones Industrial Average (DJI), NASDAQ Composite (IXIC) and S&P 500 (GSPC)). It is expected that the direction of the movements of the American stock market index returns from the previous day will be transmitted to the change of returns on the Croatian stock market index CROBEX in the present. On the other hand, according to previous research, contemporaneous co-movement effects between CROBEX and two main European stock market indexes (the DAX performance-index, GDAXI and FTSE 100, FTSE) over the same trading day is expected to exist. The paper is structured in five sections. After the introduction, the literature review section gives an overview of the empirical literature on stock market volatility on international stock markets. The main characteristics of data used in the analysis are explained in the data and methodology section, as well as the methodological framework for conducting the analysis. The main findings of the paper are presented and elaborated in the results and discussion section. The final chapter presents concluding remarks.

2. *Literature review*

In this section, a review of empirical literature about stock market volatility on international stock markets is presented and elaborated. Bonga (2019) explored the volatility of the Zimbabwe Stock Market using symmetric and asymmetric models testing the presence of ARCH effects. The GARCH (1,1) model has proved to be the most efficient model for modeling stock market volatility. The conclusion of the study is that the positive and negative shocks have a different impact on stock market returns, i.e. bad and good news increase volatility on the stock market in different magnitudes. Atoi (2014) tested the volatility of the Nigerian stock market using GARCH models. He especially highlighted the importance of various error distributions (Normal, Student's t- and Generalized Error Distribution) used in enhancing the efficiency of the models. The results indicate the presence of the leverage effect, meaning that volatility responds much more to bad news than to good news. Ching and Siok (2013)

compared the performance of GARCH-type models (GARCH, TGARCH and EGARCH) to model the volatility of the stock market in Malaysia. The performances are evaluated using three statistical error measures (MSE, RMSE and MAPE). The symmetric GARCH model performed better than the asymmetric GARCH model. The exception was the crisis period for which the asymmetric GARCH model was preferred. On the other hand, the TGARCH model worked well in the post-crisis period.

Maqsood et al. (2017) used GARCH type models for the estimation of the volatility of daily returns on the Nairobi Securities Exchange (NSE). The volatility process was highly persistent, giving evidence for the existence of a risk premium for the NSE index supporting the positive correlation hypothesis between volatility and expected stock returns. The relationship between stock volatility and stock market returns was also investigated for South Africa's and China's stock markets (Cheteni, 2016). Empirical results showed the evidence of high volatility in both countries with persistent volatility that resembles the same movement in returns. The paper mainly utilizes the GARCH and ARCH models with the purpose of estimating the volatility of financial time-series and the existence of dependence in stock market returns. The conclusion was that markets in both countries exhibited the same features in terms of volatility clustering. Bhowmik and Wang (2020) provided a systematic literature review featuring GARCH-type models, stock market returns and volatility. There have been a significant number of papers on stock market volatility on developing stock markets within the past ten years. Stock markets today have a pivotal role in economic and financial activities. It is particularly important to effectively measure the volatility of stock market returns in order to prevent uncertainty and risk on the stock market.

Ahmed and Suliman (2011) used GARCH models to model stock market volatility of the Khartoum Stock Exchange in Sudan. The results showed that the conditional variance process was highly persistent, providing evidence for the existence of a risk premium and supporting the hypothesis of a positive correlation between volatility and expected stock returns. Furthermore, asymmetric models provided a better fit than symmetric models. Goudarzi and Ramanarayanan (2010) examined the volatility of the Indian stock market using BSE500 index and ARCH models. It was found that the GARCH(1,1) model satisfactorily explains the volatility of the Indian stock market as well as stylized facts including volatility clustering, fat tails and mean reversion. Abdalla (2012) estimated and modeled the Saudi stock market index (TASI) by applying GARCH models, including both symmetric and asymmetric models and capturing stylized facts about index returns such as volatility clustering and leverage effects. The main findings of this paper are as follows: (1) TASI returns showed departure from normality and the existence of heteroscedasticity in the residuals series, and (2) conditional volatility of stock returns was quite persistent. Ugurlu et al. (2014) examined the use of GARCH-type models for modeling the volatility of stock market returns for the four European emerging countries and Turkey. The impact of past news on volatility was significant, while volatility shocks were quite persistent. According to Karunanithy and Ramachandran (2015), GARCH(1,1) and TGARCH(1,1) estimations were found to be most appropriate for modeling stock market volatility in India. The GARCH(1,1) model pointed out the existence of a positive and insignificant risk premium, while negative shocks had a significant effect on the conditional variance. Abdalla and Winker (2012) modeled stock market volatility of two African stock markets, i.e. the Khartoum Stock Exchange (KSE) and the Cairo and Alexandria Stock Exchange (CASE). The empirical results showed that the conditional variance is an explosive process for the KSE index return and quite persistent for the CSE index return. There was also evidence for the existence of a positive risk premium on both markets, supporting the hypothesis of a positive correlation between volatility and the expected stock returns. Murinde and Poshakwale (2001) investigated the main features of volatility on emerging stock markets in CEEC by applying ARIMA, the BDSL procedure and symmetric and asymmetric GARCH models. Volatility exhibited significant conditional heteroskedasticity and nonlinearity with persistent nature and could not explain expected returns for any of the six markets observed.

3. Data and methodology

The goal of this paper is to estimate and measure stock market volatility in Croatia using the GARCH(1,1) model. The focus is on the Croatian major stock market index – CROBEX. CROBEX is a price index for which the dividends are not included in the calculation. It consists of 15 to 25 shares.

In order to be included in the CROBEX index, a share should be actively traded on more than 75% of trading days. The weights of each share are based on the free-float market capitalization and the maximum weight is 10%. The revisions of CROBEX are conducted semi-annually and the last one was done in September 2020 (Zagreb Stock Exchange, 2020b). For the purpose of the analysis, CROBEX daily data for the period from 8 January 2010 to 9 October 2020 were collected (Zagreb Stock Exchange, 2020a). Data referring to the following world stock market indexes were collected in addition to CROBEX data: the DAX performance-index – GDAXI (Yahoo Finance, 2020a), FTSE 100 – FTSE (Yahoo Finance, 2020c), Dow Jones Industrial Average – DJI (Yahoo Finance, 2020b), NASDAQ Composite – IXIC (Yahoo Finance, 2020d) and S&P 500 – GSPC (Yahoo Finance, 2020e)).

It has to be emphasized that only the days for which data across all indexes were available will be used in the analysis. The data were adjusted for non-tradable days including holidays in the countries under study. It has to be mentioned that stock markets in Croatia and Germany have the same trading hours because they are located in the same time zone, while London Stock Exchange is lagging one hour behind. Stock markets in the United States of America, New York precisely, are lagging 6 hours behind in relation to the Zagreb Stock Exchange. Therefore, European indexes will be included in the mean equation and American indexes will be included in the conditional equation. Since financial time series are going to be observed, volatility clustering is likely to be present. Accordingly, a strong autocorrelation in squared returns is present, and therefore estimates calculated by the least square method are unbiased but inefficient (Erjavec and Cota, 2007). This problem can be overcome by applying generalized autoregressive conditional heteroskedasticity (GARCH) introduced by Bollerslev (1986). According to Bollerslev (1986), the GARCH (p, q) model is defined as follows:

$$\begin{gathered} y_t = x_t' b + \epsilon_t \\ \epsilon_t | \psi_{t-1} \sim \mathcal{N}(0, \sigma_t^2) \\ \sigma_t^2 = \omega + \sum_{i=1}^{q} \alpha_i \epsilon_{t-1}^2 + \sum_{i=1}^{p} \beta_i \sigma_{t-1}^2 \end{gathered} \quad (1)$$

where σ^2 is the order of generalized autoregressive conditional heteroskedasticity (GARCH) terms and ϵ^2 is the order of autoregressive conditional heteroskedasticity (ARCH) terms. For the purpose of the analysis, the most frequently applied GARCH model, i.e. the GARCH (1,1) model, will be applied (Campbell et al., 1997). In order to apply the GARCH (1,1) model, the conditional mean equation, the conditional variance equation and the conditional error distribution should be specified. The conditional mean equation, which is going to be applied is the following one:

$$\begin{aligned} rCROBEX_t = C_1 + C_2 \times rCROBEX\_VOL_t + \\ C_3 \times rDAX_t + C_4 \times rFTSE_t + \epsilon_t, \end{aligned} \quad (2)$$

where the conditional variance equation is:

$$\begin{aligned} \sigma_t^2 = C_5 + C_6 \times \epsilon_{t-1}^2 + C_7 \times \sigma_{t-1}^2 + C_8 \times rDJI_{t-1} + \\ C_9 \times rIXIC_{t-1} + C_{10} \times rGSPC_{t-1} \end{aligned} \quad (3)$$

Daily returns defined as daily percentage changes of the observed stock market indexes and CROBEX volume are used in equations 2 and 3. Equation 3 refers to a predictive model which takes into account lagged explanatory variables of American stock market indexes (Dow Jones Industrial Average (DJI), NASDAQ Composite (IXIC) and S&P 500 (GSPC)). The predictive model therefore possesses a dynamic structure. The research question which will be investigated is the existence of co-movement between CROBEX and European indexes for the same trading day and co-movement between CROBEX and American indexes lagging by one day. In order to avoid the multicollinearity problem and its negative consequences, the correlation matrix will be constructed and correlations between American and European indexes will be examined. Three conditional error distributions will be applied in the analysis. Commonly used conditional error distributions are normal (Gaussian) distribution, Student's-distribution with fixed degrees of freedom and Generalized Error Distribution (GED) with fixed parameters. Given a distributional assumption, ARCH models are typically estimated by the method of maximum likelihood. For the GARCH(1,1) model with conditionally normal errors the contribution to the log-likelihood for observation is:

$$l_t = -\frac{1}{2}\log(2\pi) - \frac{1}{2} log\sigma_t^2 - \frac{1}{2}(y_t - X_{t'}\theta)^2/\sigma_t^2 \quad (4)$$

For the Student's -distribution the log-likelihood contribution is of the form:

$$l_t = -\frac{1}{2}\log\left(\frac{\pi(v-2)\Gamma(v/2)^2}{\Gamma((v+1)/2)^2}\right) - \frac{1}{2}log\sigma_t^2 - \frac{(v+1)}{2}\log\left(1+\frac{(y_t-X_t{'}\theta)^2}{\sigma_t^2(v-2)}\right), \quad (5)$$

where v is the degree of freedom larger than 2 and t-distribution approaches the normal as v→∞, IHS Global (2020). Generalized Error Distribution can be expressed as:

$$l_t = -\frac{1}{2}\log\left(\frac{\Gamma(1/r)^3}{\Gamma(3/r)(r/2)^2}\right) - \frac{1}{2}log\sigma_t^2 - \left(\frac{\Gamma(3/r)(y_t-X_t{'}\theta)^2}{\sigma_t^2\Gamma(1/r)}\right)^{r/2}, \quad (6)$$

where r>0 is the tail parameter, GED is the normal distribution if r=2, and fat-tailed if r<2. If one has to choose between these three conditional error distributions, they could ask which one is optimal or best. To find that out, the following three conditions must be fulfilled. The first condition requires that there is no serial correlation in the residuals of error term. This condition will be tested by using the Ljung-Box Q test of standardized residuals squared. The test statistic of the Ljung-Box Q test of standardized residuals squared is:

$$Q = n(n+2)\sum_{k=1}^{h}\frac{\hat{\rho}_k^2}{n-k}, \quad (7)$$

where n is the sample size, $\hat{\rho}_k$ is a sample autocorrelation for lag k, while h is the number of lags. The second condition requires that the residuals are normally distributed. For that purpose a Jarque-Bera test statistics will be used (Equation 8):

$$JB = \frac{n}{6}(S^2 + \frac{1}{4}(K-3)^2), \quad (8)$$

where n, S and K are the number of observations (degrees of freedom), skewness and kurtosis. The third condition that must be fulfilled is that there is an ARCH effect present for which the ARCH heteroskedasticity test of residuals should be used. The null hypothesis of this test states there is no ARCH effect, while an alternative hypothesis claims the opposite. To test the null hypothesis of this test that there is no ARCH effect up to order q, we run the regression:

$$e_t^2 = \beta_0 + \left(\sum_{s=1}^{q}\beta_s\, e_{t-s}^2\right) + v_t, \quad (9)$$

where e is a residual, IHS Global (2020). The main results of the analysis will be displayed and discussion of findings elaborated in the next section.

4. Results and discussion

The basic descriptive statistics for the observed variables are presented in Table 1. The results are based on daily data for the period from 8 January 2010 to 9 October 2020. Not all days in the observed period are taken into account, only days for which the data were available across all observed stock market indexes were used in the analysis.

Table 1 Descriptive statistics for the observed variables, n=2,489 trading days

Statistics	rCROBEX	rCROBEX_VOL	rDAX	rFTSE	rDJI	rIXIC	rGSPC
Average	-0.01%	20.75%	0.04%	0.01%	0.05%	0.07%	0.05%
Std. dev.	0.79%	101.45%	1.35%	1.09%	1.13%	1.26%	1.14%
Coeff. var.	-11,543%	489%	3,364%	11,700%	2,441%	1,735%	2,221%
Median	0.00%	-1.48%	0.08%	0.05%	0.07%	0.11%	0.07%
Minimum	-10.18%	-92.68%	-12.24%	-10.87%	-12.93%	-12.32%	-11.98%
Maximum	8.94%	2,211.31%	10.98%	9.05%	11.37%	9.35%	9.38%

Source: Authors

If the CROBEX volume return variable is put aside, the descriptive statistics results for the observed stock market indexes are quite consistent across all indexes. However, if median values are compared between the stock market indexes, it seems that the CROBEX index had a negative return rate on most observed days.

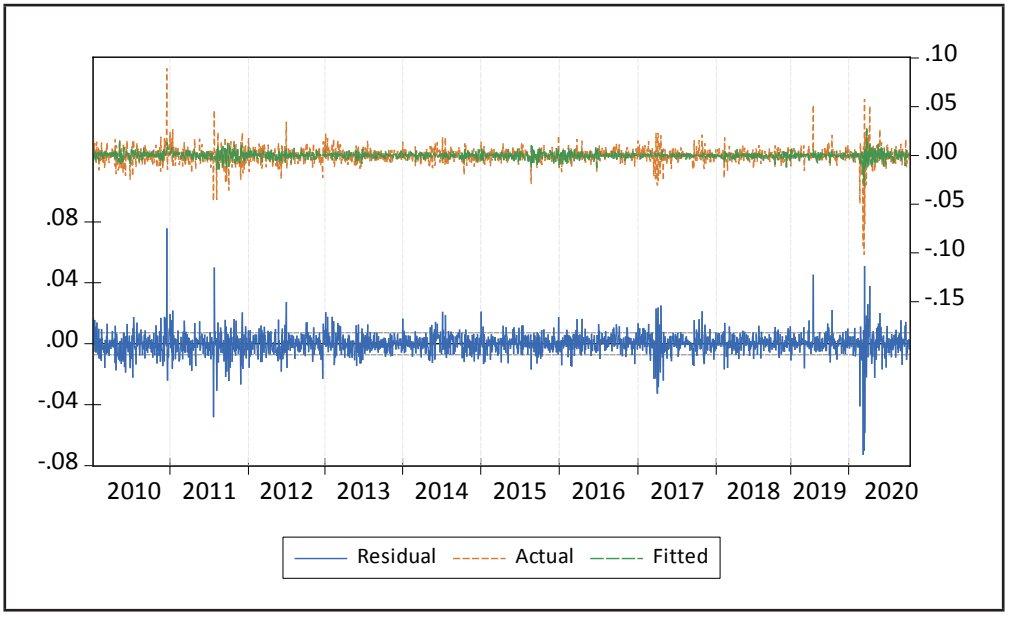
Table 2 Correlation matrix of the observed variables, n=2,489 trading days

Variables	rCROBEX	rCROBEX_VOL	rDAX	rFTSE	rDJI	rIXIC	rGSPC
rCROBEX	1.000000						
rCROBEX_VOL	0.109813	1.000000					
rDAX	0.379942	-0.037510	1.000000				
rFTSE	0.381407	-0.043422	0.855102	1.000000			
rDJI	0.358617	0.016946	0.641000	0.643651	1.000000		
rIXIC	0.314334	0.009650	0.600113	0.582975	0.901236	1.000000	
rGSPC	0.345075	0.010624	0.639863	0.641615	0.975479	0.956175	1.000000

Source: Authors

The correlations between the observed variables are displayed in Table 2. The correlation between the CROBEX return variable and the CROBEX volume return variable is positive but quite week. The individual correlations of the CROBEX return variable with other stock market index return variables are positive and of about the same strength. The CROBEX return variable has the lowest correlation with the IXIC return variable (the coefficient of correlation 0.3143), whereas the highest correlation is with the FTSE return variable (the coefficient of correlation 0.3814). Still, the difference between the lowest and the highest coefficient of correlation is very small. If the correlation coefficients between other stock market indexes are observed, it can be noticed that all three individual correlation coefficients between the DJI, the IXIC and the GSPC return variables are above the value of 0.90, implying a strong correlation between American indexes.

Figure 1 Residuals of the conditional mean equation, n=2,489 trading days



Source: Authors

As described in Equation 2, the conditional mean equation was estimated by applying the ordinary least squares method and the residuals of that model are shown in Figure 1. It seems that the periods of low volatility are followed by the periods of low volatility and the periods of high volatility are followed by such periods. Accordingly, it seems that the residual of error term is conditionally heteroscedastic, which approves the use of GARCH model. The results of the Ljung-Box Q test of standardized residuals squared for the GARCH(1,1) models are shown in Table 3.

Table 3 Ljung-Box Q statistics of standardized residuals squared for GARCH(1,1) models

Lag	Model 1	Model 2	Model 3
1	0.4275	0.3894	0.4017
2	0.5287	0.5540	0.5403
3	2.8628	1.9648	2.4435
4	2.8641	1.9743	2.4477
5	3.1273	2.2936	2.7401
6	3.9678	3.1064	3.5775
7	3.9701	3.1080	3.5791
8	3.9715	3.1828	3.5927
9	3.9850	3.2200	3.6119
10	59.905*	44.042*	52.595*
15	61.770*	45.840*	54.395*
20	63.148*	46.912*	55.598*
25	65.389*	48.851*	57.706*
30	66.262*	49.479*	58.445*
35	66.589*	49.947*	58.840*

Note: *statistically significant at a significance level of 0.05.
Source: Authors

The null hypothesis of this test contains the assumption that there is no serial correlation present in the GARCH model. The test results are the same across all three estimated models. Up to and including lag 9, the null hypothesis of the Ljung-Box Q test cannot be rejected at the 0.05 significance level, which leads to the conclusion that there is no serial correlation present in the GARCH(1,1) models. However, higher lags point to the opposite conclusion.

Table 4 ARCH heteroskedasticity test results of residuals for GARCH(1,1) models

Statistics	Model 1	Model 2	Model 3
Obs*R-squared	0.4268	0.3888	0.4011

Note: *statistically significant at a significance level of 0.05.
Source: Authors

The ARCH heteroskedasticity test results are given in Table 4. In the ARCH test, the squared residuals are regressed on lagged squared residuals and a constant. The null hypothesis of the test contains the assumption that the ARCH effect is not present. For all three GARCH(1,1) models the ARCH heteroskedasticity test results have shown that the null hypotheses cannot be rejected at the 0.05 significance level. In that way, the conclusion is that the ARCH effect is not present in either of the three GARCH(1,1) models.

Table 5 Jarque-Bera test results of residuals for the GARCH(1,1) models

Statistics	Model 1	Model 2	Model 3
Jarque-Bera	12307.87*	19194.30*	15101.92*

Note: *statistically significant at a significance level of 0.05.
Source: Authors

Jarque-Bera test results of residuals for GARCH(1,1) models are shown in Table 5. The null hypothesis of the Jarque-Bera test contains the assumption that the residuals are normally distributed. However, the null hypothesis can be rejected for all three GARCH(1,1) models at the 0.05 significance level. The residuals did not seem to be normally distributed. No decisive conclusion can be drawn as to which GARCH model is the best so all three models will be estimated.

In order to estimate GARCH(1,1) models, normal (Gaussian) distribution, Student's -distribution with fixed degrees of freedom and Generalized Error Distribution (GED) with fixed parameters as conditional error distributions are used. Therefore, all three GARCH(1,1) models were estimated and named Model 1, Model 2 and Model 3 consequently. In the first GARCH(1,1) model, normal (Gaussian) distribution was used (Model 1) as conditional error distribution, in the second GARCH(1,1) model, Student's -distribution with fixed 10 degrees of freedom was used (Model 2), and in the third GARCH(1,1) model, Generalized Error Distribution (GED) with fixed parameters at value 1.5 was used as conditional error distribution (Model 3). The estimated GARCH(1,1) models are shown in Table 6.

Table 6 Estimated GARCH(1,1) models using equations (2) and (3)

	Estimates	Model 1	Model 2	Model 3
Mean equation	C_1	-8.28E-05	-6.50E-05	-5.94E-05
		(-0.66)	(-0.58)	(-0.53)
	C_2	0.0005***	0.0003***	0.0004***
		(8.12)	(3.42)	(5.31)
	C_3	0.1033***	0.0913***	0.0937***
		(6.65)	(6.22)	(6.27)
	C_4	0.0692***	0.0571***	0.0606***
		(3.39)	(2.97)	(3.10)
Variance equation	C_5	3.03E-06***	2.09E-06***	2.55E-06***
		(10.28)	(6.44)	(7.29)
	C_6	0.0976***	0.0834***	0.0892***
		(10.25)	(7.36)	(7.62)
	C_7	0.8442***	0.8526***	0.8484***
		(64.61)	(51.49)	(48.88)
	C_8	-0.0011***	-0.0003	-0.0007***
		(-8.72)	(-1.35)	(-4.19)
	C_9	-0.0007***	-0.0002	-0.0004***
		(-6.81)	(-0.99)	(-2.96)
	C_{10}	0.0016***	0.0003	0.0010***
		(8.83)	(0.84)	(3.55)

Notes: z-statistics in parentheses. ***statistically significant at a significance level of 0.01, **statistically significant at a significance level of 0.05, *statistically significant at a significance level of 0.1.
Source: Authors

The volume of trade proved to be a positive and significant explanatory variable. The estimates of this variable were stable in all three GARCH(1,1) models. The values of the C_2 regression coefficient were relatively low in the range of 0.0003 to 0.0005. There was a positive and significant effect of DAX and FTSE returns on CROBEX returns. The ARCH and GARCH terms (regression coefficients C_6 and C_7) were significant in all GARCH(1,1) models. They are both internal shocks of the dependent variable volatility or family shocks influencing CROBEX return. The values of regression coefficients for all three American stock market index returns proved to be significant in normal (Gaussian) and Generalized Error Distribution (Models 1 and 3). However, a positive value of the regression coefficient was achieved only for S&P500 stock market index return. In order to confirm the obtained findings, the robustness check was made by estimating the GARCH(1,1) models by setting a one day lag for all explanatory variables (Table 7).

Table 7 Estimated GARCH(1,1) models, all explanatory variables lagged 1 day

	Estimates	Model 1	Model 2	Model 3
Mean equation	C_1	-2.35E-05	-1.12E-06	-1.23E-05
		(-0.18)	(-0.001)	(-0.11)
	C_2	0.0005***	0.0002***	0.0003***
		(7.22)	(2.59)	(3.99)
	C_3	0.0191	0.0196	0.0165
		(0.97)	(1.18)	(0.96)
	C_4	0.0311	0.0268	0.0320
		(1.27)	(1.30)	(1.49)
Variance equation	C_5	3.91E-06***	2.20E-06***	3.02E-06***
		(13.42)	(6.82)	(8.56)
	C_6	0.1051***	0.0858***	0.0946***
		(10.98)	(7.45)	(7.84)
	C_7	0.8275***	0.8524***	0.8385***
		(64.50)	(52.58)	(48.52)
	C_8	-0.0014***	-0.0003	-0.0009***
		(-12.23)	(-1.37)	(-5.26)
	C_9	-0.0009***	-0.0003*	-0.0006***
		(-10.22)	(-1.84)	(-4.42)
	C_{10}	0.0021***	0.0004	0.0013***
		(11.43)	(1.19)	(4.60)

Notes: z-statistics in parentheses. ***statistically significant at a significance level of 0.01, **statistically significant at a significance level of 0.05, *statistically significant at a significance level of 0.1.
Source: Authors

The results are similar to those obtained from the Table 6: (1) the volume of trade on the ZSE proved to be positively related to the daily stock market returns, (2) there was a positive and significant effect of ARCH and GARCH terms in GARCH(1,1) models, and (3) there was a positive and significant value of regression coefficients related to American stock market returns with only S&P500 having the positive value of a regression coefficient. The difference in the results given in Table 6 are insignificant regression coefficients related to European stock market returns, meaning that changes on the Euro-

pean stock markets in the previous day do not send signals to the CROBEX returns on the actual trading day.

The main findings of this paper confirm previous research in this field. The C_2 regression coefficient was relatively low in the range of 0.0003 to 0.0005, which is in line with Erjavec and Cota (2007:4). There was a positive and significant effect of DAX and FTSE returns on CROBEX returns, which is also in line with the previous results indicating the existence of co-movement of the CROBEX index and two main European indexes on the same trading day. Furthermore, the results obtained in this research point out co-movement or interconnection between the value of CROBEX returns and S&P500 returns lagging one day; a similar result was obtained by Sajter and Ćorić (2009).

5. Conclusions

The goal of this paper was to estimate stock market volatility in Croatia using GARCH(1,1) models. For the purpose of analysis, all three conditional error distributions (normal (Gaussian), Student's -distribution with fixed degrees of freedom and Generalized Error Distribution (GED) with fixed parameters) were estimated. The results have shown that volatility of CROBEX stock market returns is positively correlated with the volume of trade on the ZSE and movement of returns on main European and American stock markets, which is in line with previous research in this field. It seems that movements of S&P500 index returns are transmitted from the previous day, providing signals in the direction of change of the CROBEX index in the present. The limitations of the paper are related to the fact that only the days for which the data across all indexes were available were included in the analysis. Furthermore, the data were adjusted for non-tradable days, including holidays in observing countries. Further research in this field should be made by analyzing stock market volatility in other Central and Eastern European countries. This paper proves another strong evidence of interconnection between international stock markets; investors in Croatia strongly rely on information received from American stock markets, namely the S&P500 stock market index.

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REVIEW OF NATIONAL FINANCIAL EDUCATION POLICIES AIMED AT THE YOUNG – EVIDENCE FOR DEVELOPING AND IMPLEMENTING POLICY RECOMMENDATIONS FOR CROATIA

Abstract

Purpose: The paper investigates and synthesizes an in-depth overview of national financial education policies and strategies aimed at the young, highlights the best practices, gives recommendations for the most efficient financial education efforts at the national level and the implementation of an efficient financial education policy in Croatia.

Methodology: The analysis is conducted as a case study of financial education policies and strategies aimed at the young of the countries that achieved the best results on the OECD PISA test, Australia, the United States of America and the United Kingdom.

Results: The examined countries have national financial education policies with similar aims, fields of financial education and strategies of evaluation but, although they are part of the curriculum, the programs are mostly not standardized and financial education efforts towards teachers and parents are not emphasized.

Conclusion: To be efficient, a financial education program aimed at the young has to be relevant, customized according to participants' characteristics, has to relate knowledge to a specific action, has to be long-term, successfully evaluated, standardized on the national level, implemented at a younger age and have a specified aim. Financial education should be considered as an independent subject in formal education.

Keywords: Financial education, responsible financial behavior, financial literacy, national policies, young adults

1. Introduction

In times of acute demographic changes, pressures on the pension system and the expansion and sophistication of financial products and services, financial education is crucial for consumer protection and empowerment. Through efficient national

policies, countries can equip consumers with the necessary skills and knowledge to manage personal finances and to improve decision-making. Even though in the process of financial socialization parents have the most prominent role (Lučić et al., 2020a), national financial education strategies, when implemented effectively, have the power to cover for parents' financial deficiencies. Financial education is crucial for consumers' responsible financial behavior and well-being (Almenberg & Dreber, 2015; Atkinson & Messy, 2013; Baker & Ricciardi, 2014; Lučić et al., 2020b), especially among the young (Barbić et al., 2019; Lučić et al., 2020b; Johnson & Sherraden, 2007). At the same time, not many countries approach the problem in a systemic manner, nor do they evaluate the success of existing policies. Up to now, there has been no known published research that reviews and compares national educational policies aimed at the young. We can find reviews of overall global (Atkinson & Messy, 2013), Asia and the Pacific (Messy & Monticone, 2016) financial education politics, which were not focused on the young, and individual countries youth financial education strategies, especially from states in the USA (Brown et al., 2014).

The aim of this paper is to investigate and synthesize an in-depth overview of national financial education policies and strategies aimed at the young. This paper is a case study of financial education policies and strategies aimed at the young of the countries that achieved the best results on the Organisation for Economic Cooperation and Development (OECD) PISA test, Australia, the United States of America and the United Kingdom (OECD, 2017). The paper highlights the best practices of financial education policies and gives recommendations for the most efficient financial education efforts at the national level and the implementation of an efficient financial education policy in Croatia.

This paper approaches the topic in a unique way, filling the existing research gap as it analyses and systematically reveals efficient and recommended practices of financial education policies aimed at the young, it indirectly draws a connection between the impact of financial education policies on responsible financial behavior among the young in several completely different national settings, and it highlights which activities should be avoided and implemented to provide efficient financial education.

2. Theoretical background

2.1 Definition of financial education

Financial education is a process of improving consumers' understanding of financial terms and concepts and acquisition of skills and confidence crucial for making efficient and informed financial decisions and, finally, for achieving personal welfare (OECD, 2005). Hence, financial education improves consumers' financial knowledge and, consequently, their financial literacy (Huston, 2010). Higher levels of financial literacy have a positive effect on the finances of individuals and households, but also lead to prosperous and stable economics (Barbić et al., 2019). Therefore, financial education, as a combination of knowledge, attitudes and behavior, supports financial decision making and leads to consumers' financial well-being (Atkinson & Messy, 2012; 2013).

The aim of financial education programs is to change attitudes, behavior and knowledge of consumers in the context of personal finance (Fox et al., 2005; Lučić et al., 2020a). Financial knowledge could be acquired through formal, non-formal and informal financial education (Coombs & Ahmed, 1974; Świecka et al., 2019). Formal financial education refers to organized, structural, standardized and planned practice provided by the government through educational institutions such as elementary schools, high schools and colleges (Xiao & Porto, 2017). On the other hand, non-formal financial education implies institutionalized programs which are not part of formal education or curriculum but complement overall needs for financial knowledge (Świecka et al., 2019). Finally, informal financial education or self-education involves collecting information by talking with family members, friends or through media, professional books and the workplace (Coombs & Ahmed, 1974).

Financial education is focused on overall personal finance, money management, budgeting, savings, it emphasizes the importance of retirement planning and explains the borrowing aspect (Fox et al., 2005) and it could be directed towards children, adolescents and adults (Świecka et al., 2019). Besides financial knowledge, financial education shapes desirable skills, attitudes, behaviors and motivation required for implementing the acquired knowledge (Lewis & Messy, 2012). Therefore, for financial education to be fully implemented and to induce desirable financial behavior, all elements should be

performed together (Hogarth, 2006; Świecka et al., 2019).

2.2 The importance of financial education

Financial education, together with consumer protection policy, financial inclusion and financial regulation, is crucial for consumers' financial empowerment (OECD/INFE, 2012). It has a positive impact on financial knowledge (Lučić et al., 2020b), efficient financial decision making (Lusardi, 2008; Lusardi & Mitchell, 2014) and responsible financial behavior (Hilgert et al., 2003) which leads to consumers' financial prosperity and future wealth accumulation (Atkinson & Messy, 2012; Jappelli & Padula, 2013). Financial education has a positive effect on financial planning (Hilgert et al., 2003), participation in financial markets (van Rooij et al., 2011), national and personal savings and retirement planning (Bayer et al., 1996; Hilgert et al., 2003; Jappelli & Padula, 2013; Lusardi, 2008;), investing and borrowing (Hilgert et al., 2003) and responsible consumption (Norman, 2010). Finally, through a positive effect on financial literacy, financial behavior and financial capability, financial education leads towards financial satisfaction (Xiao & Porto, 2017).

In order to have better results in the context of personal finance and to be prepared for financial challenges, consumers have to receive financial education at a younger age (Hastings et al. 2013; Lusardi et al., 2010; Varcoe et al., 2001). As young adults are facing complex financial decisions and entering the labor market, the financial education they received or are still receiving improves their financial knowledge (Borden et al., 2008; Lučić et al., 2020b), increases their financial literacy level (Walstad et al., 2010), encourages their responsible financial behavior (Fan & Chatterjee, 2019; Lusardi & Mitchell, 2017) and allows them to make efficient financial decisions and achieve financial welfare (Braunstein & Welch, 2002; Chen & Heat, 2012). Young adults who attend financial education have lower levels of financial vulnerability (Lyons & Hunt, 2003), a higher credit score (Urban et al., 2018), are oriented towards savings (Carlin & Robinson, 2012; Mandell & Klein, 2009), and efficiently perform financial transactions (Dare et al., 2020), personal budgeting (McCormick, 2009) and tracking expenses (Johnson & Sheraden, 2007). Financial education has a positive impact on responsible borrowing and repayment behavior among young adults (Brown et al., 2016; Urban et al., 2018), helps them to learn about available financial products (Uzelac & Lučić, 2020) and provides them with an understanding of financial information from the media (Becchetti et al., 2013). Therefore, there is a significant need for institutional investment in standardized financial education aimed at young adults (Fraczek & Klimontowicz, 2015; Lusardi et al., 2010).

2.3 Elements of financial education strategies aimed at young adults

Financial education policies and strategies considering institutionalized, planned and standardized programs which are part of formal financial education for improving financial knowledge (Świecka et al., 2019). Through national strategies, financial education policies emphasize the importance of financial knowledge, coordinate and lead participants and individual programs of financial education and create guidelines for achieving financial education aim (Grifoni & Messy, 2012).

For financial education policy to be efficient, its content must be relevant and customized according to the target groups' characteristics in the context of knowledge, skills, preferences, motivation and emotional reaction (Fraczek & Klimontowicz, 2015; Hathaway & Khatiwada, 2008; Lucey 2007; Yoong, 2011), but also physical characteristics such as gender and age (Croson & Gneezy, 2009).

Financial education aimed at young adults could take place in elementary schools, high schools, academic institutions and in other forms such as online or offline workshops, competitions, training, events or games (Świecka et al., 2019). Even though the majority of financial education programs are implemented in schools, as part of the curriculum (Messy & Monticone, 2016), they are not standardized or systematized (Amagir et al., 2018; Lučić et al., 2018; Yoong & Ferreira, 2013). Financial education for young adults is focused on the understanding of financial products, empowering their financial inclusion and financial capability, young consumer protection, saving attitudes and gender equality in the context of financial knowledge (Atkinson & Messy, 2013).

In elementary school, financial education is focused on the basic understanding of money, elementary financial arithmetic and learning from the family, personal experience and financial games like Monopoly (Świecka et al., 2019). Even the basic topics covered in elementary school could lead to future

financial capability (Batty et al., 2015). High school children, in the context of financial education, often use the Internet, books and brief courses, learn from their complex experience and through consideration of going to college (Świecka et al., 2019). Teachers' preparation plays a key role in the implementation of high school financial education programs (Urban et al., 2018). For college students and young adults, financial education efforts are primarily focused on financial inclusion and consumer protection (Atkinson & Messy, 2013).

In order to achieve young adults' financial knowledge, the efforts are focused on implementing financial education as part of the curriculum (Beck & Garris, 2019; OECD, 2016). Financial education could be a compulsory or an optional subject, or it could be implemented as part of another subject such as Mathematics, Science, Physical Education or Enterprise and Technology (Messy & Monticone, 2016). Also, financial education is directed towards the professional development of teachers and the creation of efficient educational programs, available materials and tools (OECD, 2016). It could be performed offline, between students and teachers in a venue, or in a virtual environment through games, applications, interactive online lecturers or multimedia presentations (OECD, 2016; Świecka et al., 2019). The key elements of financial education policies aimed at the young are shown in Table 1.

Table 1 Elements of financial education policies aimed at the young

Element	Definition
National strategy	Financial education policy as part of national strategy efforts.
Implementation year	Financial education policy implementation.
Organization	Organization responsible for implementation.
Aim	The aim of financial education policy.
Age	Target age of financial education policy.
Evaluation	Strategy for the evaluation of financial education.
Fields	Fields covered by financial education.
Curriculum	Financial education as part of the curriculum.
Standardization	Standardized financial education on the national level.
Subject	Single-subject or multi-subject financial education approach.
Additional programs	Online tools and complementary programs.

Source: Authors

3. Methodology

The applied research was conducted by using a case study analysis of national financial education policies and strategies aimed at young adults. Case study analysis is the most adequate method to investigate financial education per country as it is based on a detailed investigation of available data from individual cases and their elaborated comparison, as conducted in similar relevant research (Atkinson & Messy, 2013; Messy & Monticone, 2012). Data used for the case study analysis were collected from three main sources: journal research papers, government, state and international agency and organization reports and websites specializing in financial education policies. National financial education policies of Australia, the United States of America, the United Kingdom and Croatia were examined in detail and compared considering their aims, contents, distribution channels, participants' characteristics, implementation as part of the curriculum, evaluation strategies and impact on improving the financial literacy of young adults. Also, efficient practices were systematically reviewed and the implications were used as guidelines for the general implementation of financial education at national levels and as a foundation of an efficient financial education policy for Croatia.

The sampling criterion for Australia, the United States of America and the United Kingdom was a high score regarding financial education aimed at

the young at the OECD PISA test from 2015, an ongoing program that provides an insight into financial educational policies and strategies of the countries involved in the program and helps to monitor trends in students' financial knowledge and skills in different demographic subgroups within each country. The results of the test identify what can be achieved through education and internationally compare data in order to develop strategies for the identification of strengths and weaknesses of national education systems, to internalize best practices and to develop appropriate financial education policies (OECD, 2017). Therefore, three countries with the highest score were selected as part of our sample in order to examine desirable financial education policies and strategies with a positive effect on the financial knowledge and financial literacy of young adults. Finally, Croatia was included in the sample to introduce the current financial education efforts aimed at the young.

4. Results

4.1 Australia

The Australian Securities and Investments Commission (ASIC), the government regulator, emphasizes three supporting dimensions of financial learning through the financial education program: financial knowledge and understanding, competencies and responsibility and entrepreneurship. All three dimensions are implemented at the very beginning of the financial education process and they suggest what concepts and terms students should know, understand and be able to demonstrate at the end of the educational program when their progress is quantified. Skills listed in dimensions are not a mandatory part of the curriculum, but they present supportive guidelines for efficient development of knowledge, desirable values and responsible financial behavior during the financial education process. From 2013, the financial education program covers five core fields: savings, spending, budgeting, investment and donations (ASIC, 2017) through all three dimensions.

Financial education is part of the Australian national curriculum, and each of the eight Australian states has the institutional responsibility to implement financial education. Financial literacy is studied as part of the compulsory subjects, Mathematics, Economics and Business and English, by students from 5 to 17 years old, through elementary school and first two grades of high school. In order to evaluate the financial education program, an internal division monitors the degree of participation in the program in schools. Students from engaged schools show a significantly higher financial literacy level than students from non-engaged schools. They have higher results in all five fields of financial programs, a better understanding of financial concepts such as interest rates and taxes, and, consequently, show more responsible behavior in the context of online shopping and finding a job, and they have a tendency for financial independence (ASIC, 2017).

ASIC's MoneySmart Teaching Program is funded by the Australian Government and it strives to develop the financial capabilities of young adults by equipping them with financial knowledge, skills and behaviors required in the 21st century. It is focused on offering online materials for students and teachers' personal and professional development (OECD/INFE, 2015) in the context of financial education and on efficient financial learning tools (Messy & Monticone, 2016). The program was developed according to the OECD international financial education guide by which financial education programs and supporting materials should be integrated into the national curriculum (OECD, 2017), their implementation should be flexible, they should be developed in partnership with other state and regional institutions and they should be performed from the beginning of primary school (OECD/INFE, 2015).

ASIC's MoneySmart Teaching Program provides teachers with curriculum-compliant teaching tools, along with personal and professional support for a successful implementation of financial education programs in their classrooms (Messy & Monticone, 2016). For that purpose, a special module Financial Health for Teachers has been developed. Financial education training for teachers has a direct impact on how teachers use available teaching tools and resources, and how they transfer knowledge. Also, teacher training has indirect effects on the effectiveness of their students in the context of financial literacy. The great majority of teachers believe that training increases their financial knowledge and makes them feel safe and confident when they teach financial literacy (ASIC, 2017).

4.2 The United States of America

The Financial Literacy and Education Commission (FLEC), the government body established under the United States federal law of The Fair and Ac-

curate Credit Transactions Act, has developed a national strategy in 2011 to promote financial literacy, improve financial well-being on the national level and evaluate outcomes of financial education. The strategy is based on improving the infrastructure for implementing, identifying, advancing and spreading effective financial education programs through partnerships between federal, state, local and non-profit associations. FLEC has developed the My Money Five website to summarize key areas of financial knowledge, support financial decision-making, and the website Building Blocks to Help Youth Achieve Financial Capability to help parents and teachers understand how young adults acquire financial knowledge, norms and skills, and their financial decision-making. Also, FLEC encourages parents to educate their children about financial concepts and money management and offers them customized and adopted content for children of different ages (FLEC, 2011).

The national strategy emphasizes the importance of financial literacy developing at an earlier age so young adults can participate in a complex financial environment. Therefore, the strategy is focused on the implementation of financial education at an earlier age, from 4 to 17 years old. The Starting Early for Financial Success Program suggests young adults must be able to make efficient decisions when using financial products and services, manage their consumption and debt, save and invest, monitor credit reports and overcome unexpected revenue loss. FLEC also encourages financial institutions to provide young adults financial education through webinars where financial experts could explain relevant financial topics and national libraries to distribute educational materials to young adults. Furthermore, in order to increase saving rates among young adults, the Youth Savings Pilot project was launched (FLEC, 2011; FLEC, 2016). The practical use of knowledge, such as opening a bank account, can be an effective way for young adults to develop desirable financial habits (Elliot & Narm, 2012). Through summer internships, FLEC promotes the youth employment program and encourages desirable skills and experience for stable employment and a strong financial future of young adults (FLEC, 2011; FLEC, 2016).

Significant for young adults' financial education is the Jump $tar Coalition for Personal Financial Literacy, which aims to provide basic financial skills during the primary and secondary education program. The Institute for Financial Literacy, as one of the partners, provides training and certification of financial education. According to the Council for Economic Education (CEE), majority of the states recognized the necessity for financial education and included personal finance in state education standards as part of other subjects, like Mathematics or English, or as specific subjects related to personal finance in high school curricula, depending on the state (CEE, 2011).

In cooperation with professional institutions and a wider professional community, the Economic and Financial Literacy Educators Review Committee developed a standard for financial education curricula. The standard does not present mandatory procedures, but gives a recommendation on what knowledge and skills should be contained in financial education programs and gives examples of best practice. It defines each of the five basic financial education categories: income, consumption, savings, borrowing and investments, prescribes how those categories should be implemented in elementary and high school education and determines the level of financial knowledge students should acquire after completing the program (CEE, 2013).

4.3 The United Kingdom

Money Advice Service (MAS) is a government-funded, free financial service focused on improving financial decision-making and money management, overcoming financial difficulties among young adults and evaluating financial education strategies implemented in 2014. Financial education programs emphasize the importance of teachable age in which children could easily acquire knowledge, form their attitudes and adopt habits in the context of personal finance. Financial education is incorporated into the curriculum as part of Mathematics, Citizenship Personal, Social, Health and Economics, for students aged 5 to 18. In addition to educational institutions, financial institutions and non-profit organizations also participate in high school students' financial education through training and workshops (MAS, 2015).

Educational interventions, as a form of direct financial education delivery, include training, classroom lessons, working groups, teaching materials, games, websites and applications. The aim of the interventions is to develop financial capability and strengthen life skills like entrepreneurship, employability and independence among young adults.

The content covers budgeting, planning, spending and saving decisions, desires and needs and understanding of financial products and concepts. The interventions could also be directed towards teachers, professionals or parents as intermediaries who also need intervention in the context of their financial knowledge (MAS, 2014). Although parents have a great impact on young adults' financial behavior (OECD, 2014), only few interventions targeted youth and their parents together.

The primary place for the implementation of financial education are schools where the majority of financial education programs are universal and mostly focused on larger groups rather than individuals. Most interventions target young adults who are in transition to achieve independence. For the improvement of their abilities and attitudes towards money, workshops and face-to-face lectures appear to be the most efficient. The content is implemented as part of the curriculum and it is comprehensive and standardized. It includes topics such as budgeting, borrowing and saving, investing, money management and real-life examples instead of abstract problems, and it focuses on practical, everyday money management advice. Finally, the focus is on experiential learning as the best teaching method for financial literacy and financial skills (MAS, 2014; MAS, 2015).

4.4 The Republic of Croatia

The Ministry of Finance and Ministry of Science and Education of the Republic of Croatia as government bodies are responsible for the financial literacy of citizens and supervise the implementation of financial education aimed at the young. The Croatian Financial Services Supervisory Agency (HANFA) focuses on preventive action by providing relevant information about financial services through its website, publication of legislation, educational texts and manuals. The Croatian National Bank (HNB) and the Croatian Chamber of Economy (HGK) as governmental institutions organize virtual lectures, workshops, debates for students and teachers and prepare educational materials (HGK, 2017; Ministry of Finance of the Republic of Croatia, 2021). The Croatian Institute for Financial Education (HIFE), a non-profit organization, improves financial education especially among the young through projects and non-formal education (Ministry of Finance of the Republic of Croatia, 2019). Every year, Croatia marks the World and European Money Week through many educational activities such as round tables, visits of pupils and students to state and financial institutions, student debates, lectures, games and publication of materials related to financial literacy (Ministry of Finance of the Republic of Croatia, 2021). Nevertheless, although great efforts are noticeable, the financial education in Croatia is not structured and comprehensive.

In 2015, under the leadership of the Ministry of Science and Education of the Republic of Croatia, the Comprehensive Reform of Education for elementary and high schools for students aged 7 to 18 introduced financial literacy as part of the curriculum (Croatian Parliament, 2016). Financial literacy was implemented as part of compulsory subjects, Civic Education and Entrepreneurship but it was not obligatory and depended on schools. Educational cycles of multi-subject approach cover financial knowledge, participating in financial projects and understanding of financial service usage. Key topics of financial educational cycles are market, money, supply and demand, savings, taxes, insurance, funds, financial institutions and micro and macro environment (Ministry of Science and Education of the Republic of Croatia, 2017). The reform emphasizes the need for early intervention in the context of financial literacy and introduces financial literacy as an important topic in formal education but there is no standardized approach on the national level or evaluation of financial education implementation.

Although many financial education activities such as seminars, lectures, workshops, financial quizzes, debates, educational visits, production of educational materials are focused on the young, they proved to be an extremely vulnerable target group as they got the worst results in all categories, financial knowledge, financial behavior and attitude on the PISA 2015 test (OECD, 2017). Therefore, the Financial Literacy Task Force was formed to raise the level of financial literacy among the young during the year, as defined by the Action Plan adopted for each year in accordance with the National Strategic Framework for Financial Literacy of Consumers for the period from 2015 to 2020 (Official Gazette, No. 11/15). However, financial education activities are still performed occasionally and only partially include teachers and parents as important socialization agents.

5. Discussion

Each country has developed and adjusted its national strategy for improving, integrating and coordinating a financial education policy according to their specific evaluated situation and the financial education aim they want to achieve in the future (Grifoni & Messy, 2012). Each national strategy is

implemented by a governmental institution but the duration varies. The United States had more time to evaluate its strategy, while Croatia still interprets its results (Official Gazette, No. 11/15). Overall elements of financial education policies aimed at the young are shown in Table 2.

Table 2 Review of financial education policies' elements per country

Element	Country			
	Australia	**USA**	**UK**	**Croatia**
National strategy	Yes	Yes	Yes	Yes
Implementation year	2013	2011	2014	2015
Organization	Australian Securities and Investments Commission	Financial Literacy and Education Commission	Money Advice Service	The Ministry of Finance and Ministry of Science and Education of the Republic of Croatia
Aim	To develop financial capabilities of young adults through increasing financial knowledge, skills and behaviors required in the 21st century	To promote financial literacy and improve financial well-being on the national level and improve financial education infrastructure aimed at the young	To develop financial capability and strengthen life skills among young adults.	To raise the level of financial literacy among the young.
Age	5 – 17	4 – 17	5 – 18	7 – 18
Evaluation	Yes	Yes	Yes	No
Fields	Savings, spending, budgeting, investment and donations	Income, consumption, savings, borrowing and investments	Budgeting, planning, spending and saving decisions, desires and needs, understanding of financial products and concepts	Market, money, supply and demand, savings, taxes, insurance, funds, financial institutions and micro and macro environment
Curriculum	Yes	Yes	Yes	Yes
Standardization	No	No	Yes	No
Subject	Multi-subject approach (Mathematics, Economics & Business, English)	Multi-subject approach (Mathematics, English) or single subject Personal Finance	Multi-subject approach (Mathematics, Citizenship Personal, Social, Health, Economics	Multi-subject approach (Civic Education, Entrepreneurship)
Additional programs	Yes	Yes	Yes	Yes

Source: Authors

The aims of investigated financial education policies are similar in all five countries and focused on increasing financial knowledge, financial literacy and financial capability of young adults which could be achieved by affecting their attitudes, skills and behavior (Fox et al., 2005; Huston, 2010; Lučić et al., 2020a), which, consequently, leads to personal and global well-being (Atkinson & Messy, 2012; 2013; Barbić et al., 2019; Jappelli & Padula, 2013). As the aim of financial education has to be specified and measurable (Kozup & Hogarth, 2008), Croatia could expand and elaborate theirs with specific skills, attitudes or behavior.

As financial education aimed at the children and the young, could provide them financial satisfaction in the future (Xiao & Porto, 2017), early implementation of financial education is crucial (Fraczek & Klimontowicz, 2015; Hastings et al. 2013; Lusardi et al., 2010; OECD, 2005; Varcoe et al., 2001). As all examined countries noticed the importance of financial education programs at an earlier age, they provide financial education to children starting from age 4 or 5 (FLEC, 2011; MAS, 2015; OECD/INFE, 2015). As Croatia implements financial education for elementary school students aged 7, the preschool children should be reconsidered as potential financial education target groups so they could encounter the idea of personal finance at a younger age.

Fields covered by financial education programs in all five countries are in line with previously defined financial education fields: personal finance, money management, budgeting, savings, borrowing and planning (Fox et al., 2005). Also, in accordance with previous research, the financial education formal programs for the young are implemented in elementary and high school through the multi-subject approach, as part of other compulsory subjects (Messy & Monticone, 2016) rather than as a single subject. Therefore, financial education or financial literacy, as a product of financial education (Huston, 2010; Walstad et al., 2010), should be reviewed as a separate subject in order to enhance the financial knowledge and skills among students so they would be prepared for complex financial decision in the future.

Financial education, in all five countries, is studied as part of the national curriculum which emphasized its importance and efficiency (Beck & Garris, 2019; OECD, 2016). Also, all countries, besides Croatia, have elaborated evaluation strategy which allows them to estimate their efforts in the context of financial education. Therefore, Croatia should develop a systematic evaluation system and long-termed financial education program in order to detect successful and effective practice and avoid inefficient actions. Although, financial education in implemented as part of the curriculum, it is standardized only in The United Kingdom (MAS, 2014; MAS, 2015). On the other hand, in Australia (OECD/INFE, 2015) and the United States (CEE, 2011), financial education depends on state regulation, while in Croatia (Ministry of Science and Education of the Republic of Croatia, 2017), depends on structure and policy of the school. Therefore, financial education policy should be standardized in order to assure effectiveness and uniformity of financial education in the whole country (Fraczek & Klimontowicz, 2015; Świecka et al., 2019).

Additional programs for students in all five countries include workshops, lectures, official websites, games and online tools used in addition to formal education, which amplifies its effect (OECD, 2016; Świecka et al., 2019). Programs aimed at the teachers are efficiently implemented in all countries except Croatia. Therefore, this problem should be addressed in order to improve teachers' financial knowledge so they could correctly and efficiently pass it on (OECD, 2016). Furthermore, programs aimed at the parents are efficiently implemented only in the United States (FLEC, 2011). As parents are an important socialization agent for young adults, they consequently have to be included in financial education programs (Lučić et al., 2020a).

6. Conclusion

Financial education as a process of improving young adults' skills, attitudes and behavior in the context of personal finance, financial literacy, financial capability and financial knowledge leads to personal and economic welfare (Barbić et al., 2019; Fox et al., 2005; Huston, 2010; Lučić et al., 2020a; OECD, 2005). Therefore, it is crucial to implement efficient and successful financial education aimed at young adults who are facing complex financial decisions and entering the labor market (Borden et al., 2008; Lučić et al., 2020b). In order to be efficient, financial education programs aimed at the young have to be relevant and customized according to participants' characteristics (Fraczek & Klimontowicz, 2015; Hathaway & Khatiwada, 2008; Lucey 2007; Yoong, 2011) and have to relate the knowledge with a specific action which could lead to a better implementation of financial education (McCormick, 2009).

Because of the low financial literacy score of young adults (OECD, 2017), Croatia has to make a continuous and long-term investment in financial education in order to create a successful evaluation system. Furthermore, it has to standardize financial education programs on the national level, consider introducing financial education as an independent subject and earlier implementation of financial education, define the aim of financial education more specifically and direct efforts towards teachers and

parents of young adults. Recommendations for Croatia should be considered as general guidelines for financial education national policies as well.

The main limitation refers to the sample. Only five countries were included in the sample and no Asian or Scandinavian country was considered. Therefore, further research should examine more countries and their financial education policies according to their score on the PISA test. In addition to the countries with high scores, the countries with low scores should be investigated in order to detect and highlight inefficient practices which should be avoided. Furthermore, the effects of financial education cannot be isolated only as an outcome of the national strategy, as the effectiveness of the education system could also affect the implementation of financial education. Therefore, the assessment of the entire education model should be taken into consideration. Finally, future research should continually investigate financial education's results as the quality of the evaluation depends on the duration of financial education implementation.

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ASSESSMENT OF TRANSPARENCY OF AUDIT REPORTS BASED ON PRESENTATION OF KEY AUDIT MATTERS – THE CASES OF BOSNIA AND HERZEGOVINA AND CROATIA

Abstract

Purpose: One of the ways to enhance transparency and usefulness of audit reports is to include information on key audit matters (KAMs). In this paper, based on the presented KAMs, we investigate transparency of audit reports of listed companies in Bosnia and Herzegovina and in Croatia.

Methodology: For the purposes of this research, we collected and systematised data from published audit reports and then analysed them by means of descriptive statistical methods.

Results: The research results show that in Croatia only a few audit reports lack a section on KAMs and there is no difference between the audit reports issued by the Big Four and the reports of other audit firms. In Bosnia and Herzegovina, most audit reports do not include a section on KAMs, but, unlike the Big Four, who disclose at least one KAM, other audit firms generally do not present any. Additionally, the research results show differences in the number of communicated KAMs between the audit reports prepared by the Big Four in Croatia and their reports for Bosnia and Herzegovina. There are also differences in the type of KAMs used in the two observed countries.

Conclusion: Having analysed the situation in the two developing countries, we obtained different results. The discrepancies mainly stem from the varying degrees of transparency of the audit profession in each country.

Keywords: Key audit matters, responsibility of the auditor, audit/auditor's report, transparency of audit reports, reliability of financial statements

1. Introduction

The financial reporting system and an audit of financial statements are an important factor to the efficiency of the capital market. According to Bédard et al. (2016) and Gimbar et al. (2016), audit reports can have a significant impact on capital market reactions. Financial information provided by the accounting information system reduces information

asymmetry between different stakeholders and thus supplies them with the necessary information to make efficient business decisions. Furthermore, a financial statement audit gives credibility to those statements and provides assurances to their users that the information presented is fair, objective and reliable. Therefore, a financial statement audit is aimed at increasing stakeholder confidence in the statements, and independent auditors play an important role in reducing information asymmetry between stakeholders within and outside of a company. According to Piot (2001), some of the goals of an independent audit are to decrease informational asymmetry, minimise a conflict of interest, reduce agency costs, and consequently increase the reliability of financial statements.

The primary medium of communication between an independent auditor and different stakeholders is the auditor's report, supporting financial statements of a company. Making financial statements of companies and the related audit reports public is in the public interest. The main purpose of financial statements is to present comprehensive timely and reliable information about the company's business (financial position, financial performance, and cash flows). Different stakeholders (investors, creditors, the public, owners, and others) use financial statements as a key source of information on a company's operations and decision-making. Consequently, transparency of financial reporting and audit reports is critical for building confidence of different stakeholders in the reporting system and, ultimately, for efficient functioning of the entire economy. Similarly, understanding how the content of audit reports affects the users of financial statements and accounting information is crucial to determining whether independent auditors fulfil their role in having the market function properly (Alves Júnior & Galdi, 2020).

Following the recent global financial crisis (2008-2009), stakeholders have criticised financial reporting of companies and the reports prepared by external auditors. The length and complexity of annual accounts and audit reports lead to information overload and thus greatly reduce their usefulness for decision-making (Gimbar et al., 2016). However, there are also many cases where audit reports are not publicly available. Bédard et al. (2016) highlighted that information asymmetry and different interests of the boards of directors, auditors and capital markets create a great gap.

To achieve better transparency of the auditing process and verifiability and relevance of audit reports and financial statements, as well as to satisfy the informational needs of different stakeholders, in January 2015, the International Auditing and Assurance Standards Board (IAASB) issued the new International Standard on Auditing (ISA) 701, *Communicating Key Audit Matters in the Independent Auditor's Report*. The aim of the new auditor's report is to communicate specific metrics and information about the company, provide better transparency for stakeholders, ensure a better informative link between auditors and investors by highlighting the most important of the information the management decide to disclose to the users of financial statements and accounting information (Alves Júnior & Galdi, 2020).

To that end, this paper seeks to investigate if the audit reports for the companies listed on the stock markets in Croatia and Bosnia and Herzegovina include a section on KAMs and, by providing more information on key risk areas, make the operations of those companies more transparent. The number of issues that will be identified as key issues depends on the complexity of an entity, the nature and environment of the entity's business, and on the facts and circumstances of the audit engagement. An auditor's report for a listed company is expected to include at least one KAM. Accordingly, we addressed the following research questions:

RQ1: Do the audit reports include sections on KAMs?

RQ2: Is the number of KAMs communicated in the audit reports prepared by the Big Four different from that found in the reports of other local audit firms?

RQ3: Which issues are most frequently selected as KAMs?

RQ4: Is the number of KAMs communicated in Croatia different from the number of KAMs disclosed in Bosnia and Herzegovina?

To answer the research questions, this study attempts to investigate:

- The institutional frameworks for the audit profession in Bosnia and Herzegovina (the Federation of Bosnia and Herzegovina and the Republic of Srpska) and Croatia; and
- The practices of applying the requirements of ISA 701 in Croatia and Bosnia and Herzegovina, by collecting and analysing audit reports for the shareholding companies listed on SASE (the Sarajevo Stock Exchange), BLSE (the Banja Luka Stock Exchange), and ZSE (the Zagreb Stock Exchange) in the last two years (2018-2019).

In terms of structure, the paper starts with a brief introduction, followed by a literature overview. The third section provides key characteristics of the statutory audit requirements and the capital markets in Bosnia and Herzegovina and Croatia. The fourth section covers research methodology, whilst research results and discussion are laid down in the fifth section. The paper ends with concluding remarks, limitations of the study, and possible directions for future research.

2. Literature overview

An audit of financial statements serves as a link between those statements and different market stakeholders. The International Standards of Auditing (ISA) affect the way in which audits of financial statements are conducted and the form of audit reports, consequently impacting the understanding of the reports. In the modern business environment, traditional communication between independent auditors and financial statement users is no longer sufficient and today stakeholders also need information on the way in which independent auditors create their opinions. Furthermore, auditors have been criticised for using a highly standardised language, failing to properly explain the basis for their opinions as provided in the reports, and for a lack of communication with stakeholders whose interest they are meant to protect (Cordoș & Fülöp, 2015).

The goal of ISA 701 *Communicating Key Audit Matters in the Independent Auditor's Report* is to have audit reports point out KAMs and, consequently, to make the work of independent auditors more transparent. KAMs are the matters which an independent auditor finds most important during an audit of financial statements for a reporting period. KAMs serve to communicate specific information on the company in an auditor's report. Hence, one of the reforms involves a transition from a standardised auditor's report without any company-specific information to a report which would provide such information in the form of the so-called KAMs and significant risks of a material misstatement in the company's financial statements (Sneller et al., 2017). KAMs are considered to be those areas of financial reporting that have required the most significant or complex management reasoning and the areas where the auditor has focused most on the identified risk.

The issue of disclosing KAMs in an auditor's report is closely connected to the quality of an audit. Providing company-specific and audit-specific KAMs in an auditor's report will help increase stakeholder confidence in the report and the financial statements, and thus enhance communication between different stakeholders. Ittonen (2012) emphasised that publishing audit reports with KAM disclosure should ensure appropriate audit and financial reporting quality that is in line with the interests of different market stakeholders.

Christensen et al. (2014) found that investors who received an auditor's report with a paragraph on KAMs were more likely to change their investment decisions than those who received a standardised report. Conversely, there are certain circumstances wherein KAMs do provide added value for the stakeholders. Bédard et al. (2019) highlighted that this will happen when KAMs include already known or expected information. Brasel et al. (2016) stressed that KAMs are of low value to the stakeholders if the information disclosed is not new or useful, whilst Bédard et al. (2019) pointed out that the use of technical language in preparing audit reports and disclosing KAMs contributes to investors' and other stakeholders' poor understanding of the information.

Gold et al. (2020) found that KAM disclosure in audit reports functions as a beneficial mechanism for improving the quality of managerial financial reporting. Based on the analysis of audit reports of 128 Jordanian public shareholding companies, Altawalbeh and Alhajaya (2019) concluded that disclosed KAMs provide investors with useful information and have a notable impact on their decisions. Köhler et al. (2020) showed that assessments of a company's economic situation by investment professionals are influenced by variations in KAM disclosures. Moreover, they found that investors assess a company's financial performance significantly better when a KAM discloses negative rather than positive information. Reid et al. (2019) discovered that KAM disclosure in audit reports leads to a significant improvement in the quality of financial reporting without a notable increase in audit fees or audit delays. Conversely, Li et al. (2019) concluded that the introduction of the new audit reporting standard improved audit quality but was also followed by a significant increase in audit fees.

An important question in relation to the introduction of KAMs is how many and which KAMs exactly should be communicated in an auditor's report. The number of KAMs to be included in an auditor's report may depend on the size and complex-

ity of the entity, the nature and environment of its business, and on the facts and circumstances of the audit engagement (IAASB, 2016). Cordoș & Fülöp (2015) find it appropriate to include anywhere between two to seven KAMs in an auditor's report. Sirois et al. (2018) believe that the inclusion of multiple KAMs increases the complexity of an auditor's report and dilutes the statutory auditor's message. Based on the results of a *Deloitte* (2017) analysis of 50 listed companies in Switzerland, audit reports included, on average, 2.8 KAMs per a group audit and 0.8 KAMs per a holding company. Moreover, in around 26% of the analysed audit reports only one KAM was disclosed, whilst the maximum number of KAMs disclosed was seven. Tušek & Ježovita (2018) investigated the reporting of KAMs in audit reports for Croatian public interest entities listed on the Zagreb Stock Exchange for 2016 and 2017. The research results showed that in 2016 18% (22) of the reports did not disclose KAMs, whilst in 2017 that percentage dropped to 5% (6). They also found that most of audit reports included one (41.9%) or two (32.2%) KAMs.

In their study conducted on a sample of 447 Brazilian listed companies, Ferreira & Morais (2020) found that audit reports of more complex companies audited by the Big Four and the reports that presented unmodified opinions included a number of KAMs. Furthermore, they discovered that the higher the auditor's fee in relation to total assets, the lower the number of KAMs. One should emphasise that 71.36% of the listed companies in Brazil are audited by the Big Four. They found also that the Big Four auditors, on average, present 2.61 KAMs in their reports, while Non-Big Four auditors present 1.95 KAMs. Pinto & Morais (2019) analysed audit reports for listed companies in Europe (AEX 25, FTSE 100, and CAC 40) and identified that a higher number of business segments (complexity) and more precise accounting standards lead to disclosure of more KAMs. Additionally, their results indicate a positive correlation between the audit fee and the number of disclosed KAMs.

To our knowledge, no similar studies were conducted in Bosnia and Herzegovina or Croatia. Similarly, we found no research studies that compare the number of KAMs in audit reports for companies in a non-EU country (Bosnia and Herzegovina) with its counterpart for an EU Member State (Croatia). We believe that the results of our research as presented in this paper will provide new insights in the application of new requirements of the International Standards on Auditing related to KAMs. Furthermore, the results should show if there is a difference in the number of KAMs included in the audit reports prepared by the Big Four as compared to the number of KAMs disclosed in the reports of other local audit firms, as well as whether there are differences in communicating KAMs between audit firms in EU and non-EU countries.

3. Regulatory frameworks for audit in Croatia and Bosnia and Herzegovina

Both Croatia and Bosnia and Herzegovina apply international standards (IFRS/IAS and IASs) in their reporting and audit. In terms of determining the obligors and their definition, the exact audit arrangements in the two observed countries are given below.

3.1 Republic of Croatia

As an EU Member State, Croatia must harmonise its accounting and auditing regulations with the EU requirements. Financial statements and consolidated financial statements of public interest and of large or medium-sized entities are subject to statutory audit. So are financial statements of the entities that have their securities traded on the financial market or are preparing for their issue. Pursuant to the Accounting Act (Official Gazette 78/15-47/20), which regulates the accounting system in the Republic of Croatia, legal entities are classified as micro, small, medium-sized or large, based on the following criteria (Table 1).

Table 1 Criteria for classification of entities by size in the Republic of Croatia

Criteria	Micro	Small	Medium-sized
Total assets (EUR[1])	344,370	3,973,510	19,867,550
Total revenue (EUR)	688,740	7,947,020	39,735,100
Average number of employees in the year	10	50	250

Source: Article 5 of the Accounting Act, Official Gazette, 78/15 - 47/20

[1] Exchange rate 7.55 KN/EUR.

Large entities are the entities that exceed at least two of the three criteria for medium-sized entities. Furthermore, the category includes banks, savings banks, electronic money institutions, insurance companies, reinsurance companies, leasing companies, UCITS fund management companies, alternative investment fund management companies, UCITS funds, alternative investment funds, pension companies that manage mandatory pension funds, pension companies that manage voluntary pension funds, voluntary pension funds, mandatory pension funds, and other financial institutions.

3.2 Bosnia and Herzegovina

Bosnia and Herzegovina consists of two entities, the Federation of Bosnia and Herzegovina and the Republic of Srpska, and of Brcko District. Each constituent part has its own accounting and auditing regulations.

Unlike Croatia, as a non-EU country, Bosnia and Herzegovina did not completely harmonise the criteria for classifying companies or the requirements related to audit companies with the EU regulations. Furthermore, IASs are prescribed as a normative basis for conducting audits in each constituent part of the country.

a) Federation of Bosnia and Herzegovina

The accounting system in the Federation of Bosnia and Herzegovina is regulated by the Law on Accounting and Auditing (Official Gazette, No. 83/09)[2]. According to this law, legal entities are classified as small, medium-sized and large according to the following criteria (Table 2).

Table 2 Criteria for classification of entities by size in the Federation of Bosnia and Herzegovina

Criteria	Small	Medium-sized
Total assets (EUR[3])	511,292	2,045,167
Total revenues (EUR)	1,022,584	4,090,335
Average number of employees in the year	50	250

Source: Article 4 of the Law on Accounting and Auditing, Official Gazette of the Federation of Bosnia and Herzegovina, No. 83/09

Large legal entities are banks, micro-credit organisations, credit unions, insurance companies, leasing companies, investment fund management companies, mandatory and voluntary pension funds, broker companies and other financial organisations, as well as all companies that exceed two of the three criteria for medium-sized legal entities.

Financial statements and consolidated financial statements of the entities classified as large or medium-sized are subject to a statutory audit, and so are financial statements of the entities that have their securities traded or are preparing for their issue.

b) Republic of Srpska

The Law on Accounting and Auditing of the Republic of Srpska regulates the issues of financial reporting and auditing, and the classification of legal entities according to the criteria given below (Table 3).

Table 3 Criteria for classification of entities by size in the Republic of Srpska

Criteria	Micro	Small	Medium-sized
Total assets (EUR)	127,823	511,292	2,045,167
Total revenues (EUR)	255,646	1,022,584	4,090,335
Average number of employees in the year	5	50	250

Source: Article 5 of the Law on Accounting of the Republic of Srpska, Official Gazette of the Republic of Srpska 94/15-78/20

[2] The new Law on Accounting and Auditing in the Federation of Bosnia and Herzegovina is in the process of publication. Namely, it has been adopted but is yet to be published in the Official Gazette. The new Law includes a new classification rule and introduces micro entities.

[3] Exchange rate 1.95583 BAM/EUR.

Banks, micro-credit companies, credit unions, insurance companies, leasing companies, investment funds management companies, compulsory and voluntary pension funds, stock exchanges and other financial organisations are considered large legal entities. Financial statements are audited in accordance with the International Standards on Auditing, whilst financial statements of public-interest entities and large legal entities, and consolidated financial statements are subject to a statutory audit. Public-interest entities include legal entities that have their securities traded or are preparing for their issue on the organised securities market, and all legal entities of special importance to the Republic of Srpska, irrespective of their legal status and form of organisation.

According to the Law on the Securities Market, listed companies are required to submit an audit report to the stock exchange no later than the end of June of the current year for the financial statements of the previous year.

4. Research methodology

To answer the research questions, we conducted secondary data analysis, i.e. audit reports disclosed on the websites of the Zagreb Stock Exchange (ZSE), as the only stock exchange in Croatia, and of the two stock exchanges in Bosnia and Herzegovina, namely the Banja Luka Stock Exchange (BLSE) and the Sarajevo Stock Exchange (SASE). We reviewed the reports prepared by either one of the Big Four or by another audit firm to confirm if there is a section on KAMs, and if so, which issues were considered as KAMs, and how many of them were identified as such.

As aforementioned, both observed countries have accepted IASs as a normative basis for conducting audits. In line with the EU regulations, both Croatia and the Federation of Bosnia and Herzegovina already started to apply the "new" IAS 701 to the audit of financial statements for the year ending 31 December 2017. In the Republic of Srpska, the application of the standard was moved forward and will only affect the financial statements for the year ending 31 December 2018. In this light, we reviewed the audit opinions for the financial statements for 2018 and 2019.

The research sample for ZSE includes companies from both financial and from non-financial sectors. In 2020, 102 companies were listed on ZSE. We have analysed the 2018 and 2019 audit reports for 97 and 98 companies, respectively. Other companies did not attach audit reports to their annual accounts or did not disclose their financial statements publicly at all.

In 2020, 251 issuers were listed on SASE. Out of that number, 137 issuers were involved in at least one transaction. We have analysed the 2018 audit report for 86 companies, and the 2019 reports for 65 of them. Other companies did not attach audit reports to their annual accounts or did not disclose their financial statements publicity at all.

In 2020, 471 issuers were listed on BLSE. Out of that number, 76 were undergoing bankruptcy and 11 were in the process of liquidation, i.e. only 384 joint stock companies are still active. Audit reports for 2018 and 2019 were published by 194 issuers. A random sample of 60 audit reports for each year for both financial and non-financial sectors was reviewed. The sample covers 31% of the population, i.e. publicly disclosed audit reports.

5. Research results and discussion

The firms which audited the financial statements of the selected listed companies are given in Table 4. They are divided into two groups, namely the 'Big Four' and 'Other audit firms.' In Croatia, the Big Four audited over 50% of the financial statements of listed companies, whilst in both Bosnia and Herzegovina entities combined that percentage amounted to less than 20% (except in the Federation of Bosnia and Herzegovina in 2018, when the percentage was 24%.). Analysis of concentration of audit service providers for listed companies gave us varying results. Specifically, in Croatia, a total of 29 audit firms audited listed companies, in the Republic of Srpska, that number was 16, and in the Federation of Bosnia and Herzegovina, as many as 41 audit firms. We found that in comparison to Croatia, in Bosnia and Herzegovina, significantly more listed companies were audited by other audit firms. The group includes companies whose parent company is not based in the observed countries but requires that its subsidies are audited by the Big Four. The number of companies listed on ZSE, whose parent company is not in Croatia is much higher than in the case of companies listed on BLSE and SASE.

Table 4 Audit firms that performed an audit of financial statements

Audit firm	Croatia				Republic of Srpska				Federation of B&H			
	2018		2019		2018		2019		2018		2019	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Deloitte	22	23%	19	20%	4	7%	3	5%	11	13%	7	11%
Ernst & Young	9	9%	8	8%	3	5%	2	3%	2	2%	3	4%
KPMG	10	10%	12	12%	2	3%	2	3%	2	2%	1	2%
PwC	15	16%	12	12%	0	0%	0	0%	6	7%	2	3%
Other audit firms	41	42%	47	48%	51	85%	53	89%	65	76%	52	80%
Total	*97*	*100%*	*98*	*100%*	*60*	*100%*	*60*	*100%*	*86*	*100%*	*65*	*100%*

Source: Research done by the authors

In line with the research goal, we have analysed the disclosure of KAMs in the audit reports (Table 5). In Croatia, only 5 (5.15%) audit reports in 2018 and 8 (8.16%) in 2019 showed no KAMs. Most audit reports included one (60.83% in 2018, 55.11% in 2019) or two (20.62% in 2018, 26.53% in 2019) KAMs. Audit reports with three or more KAMs take up a very small portion of the total number (13.40% in 2018, 10.20% in 2019). In Bosnia and Herzegovina, the situation was quite different. In the Republic of Srpska, 45% of the audit reports in 2018 and 43% in 2019 stated that there were no KAMs to report, whilst in the Federation of Bosnia and Herzegovina, that percent was 60% in 2018 and 52% in 2019. Most of the audit reports for both Bosnia and Herzegovina entities that include KAMs were those with one KAM, and less than 20% of them showed more than one. At the same time, only a few reports communicated more than three KAMs. However, the number of audit reports in Bosnia and Herzegovina that did not disclose any KAMs in 2019 dropped compared to 2018.

Here, one should mention that Moroney et al. (2020) found that the inclusion of KAMs improves perceived value and credibility for stakeholders only when a non-Big Four firm conducts an audit. Conversely, perceived value and credibility of the audits performed by a Big Four firm are high regardless of whether KAMs are included or not. Although IAS 701 requires the inclusion of at least one KAM for listed companies, our research shows that most audit reports in Bosnia and Herzegovina contain none, and that, therefore, the goal to improve audit reports by providing additional information and better transparency has not been achieved.

Table 5 Number of disclosed KAMs per an auditor's report

Number of KAMs	Croatia				Republic of Srpska				Federation of B&H			
	2018		2019		2018		2019		2018		2019	
	n	%	n	%	N	%	n	%	n	%	n	%
0	5	5.15%	8	8.16%	27	45.00%	26	43.34%	51	59.31%	34	52.31%
1	59	60.83%	54	55.11%	23	38.33%	24	40.00%	18	20.93%	22	33.85%
2	20	20.62%	26	26.53%	7	11.67%	8	13.33%	12	13.95%	8	12.31%
3	12	12.37%	9	9.18%	3	5.00%	2	3.33%	4	4.65%	1	1.53%
4	1	1.03%	1	1.02%	0	0.00%	0	0.00%	1	1.16%	0	0.00%
Total	*97*	*100%*	*98*	*100%*	*60*	*100%*	*60*	*100%*	*86*	*100%*	*65*	*100%*

Source: Research done by the authors

Table 6 provides descriptive statistics on the number of disclosed KAMs. The results for Croatia show no major discrepancies in the number of KAMs communicated in the audit reports prepared by the Big Four and the number of KAMs in the reports done by other audit firms.

Table 6 Descriptive statistics on the number of KAMs included

Number of KAMs	Mode	Median	Mean	Standard deviation	Count
Croatia					
Deloitte	1	1	1.07	0.65	44
Ernst & Young	1	1	1.53	0.80	26
KPMG	1	1	1.50	0.80	33
PwC	1	1	1.52	0.80	41
Other audit firms	1	1	1.50	0.86	132
Federation of Bosnia and Herzegovina					
Deloitte	1	1	1	0.53	17
Ernst & Young	1	1	1.2	0,4	6
KPMG	1	1	1.33	0.47	4
PwC	1	1	0.63	0.48	5
Other audit firms	0	0	0.58	0.79	67
Republic of Srpska					
Deloitte	1	1	1	0	7
Ernst & Young	1	1	1	0	5
KPMG	2	2	2	0	8
PwC	0	0	0	0	0
Other audit firms	0	0	0.70	1.09	72

Source: Research done by the authors

In the Republic of Srpska, we can see that the Big Four audit firms included at least one KAM in all their reports (*Deloitte* and *Ernst & Young* include one KAM per an auditor's report and *KPMG* two), whilst other audit firms usually did not disclose any. If we exclude from other audit firms both *BDO* and *Grant Thornton* as international audit firms that audit a significant number of listed companies, this leaves 65 audits in total. Sixteen (16) of them have included some KAMs, which gives 0.25 KAMs per an audit. In the Federation of Bosnia and Herzegovina, the Big Four firms included at least one KAM in each audit report, whilst the average number of KAMs for other audit firms was 0.58, i.e. they included 67 KAMs in 116 audit reports.

Therefore, the above results for Croatia show no big difference in the number of KAMs included in the audit reports by the Big Four and the number of KAMs found in the reports made by other audit firms, but the difference does exist in Bosnia and Herzegovina.

Table 7 Structure of the disclosed KAMs

Key audit matters	Croatia		RS		FB&H	
	2018	2019	2018	2019	2018	2019
Inventories	20	10	4	2	6	1
Receivables	2	2	1	2	7	1
Property, plant and equipment	3	8	1	3	6	2
Investment property	5	6	2	3	2	2
Financial instruments and fair value	3	6	0	0	0	0
Capitalization of costs	4	3	2	2	0	0
Liabilities valuation	7	6	0	0	0	0
Contingent liabilities and litigation settlements	7	3	0	0	0	0
Provisions	4	3	0	1	4	3
Business combinations	4	10	0	0	0	0
Revenue recognition	26	25	19	19	12	13
Impairments	29	26	3	4	5	2
Estimates	8	12	0	0	0	0
Going concern assumption	3	3	1	0	5	4
Leases	0	9	1	0	0	2
Expected credit losses	0	0	5	6	8	9
Biological assets	0	0	1	1	0	0
Other	14	5	6	3	3	2
Total	*139*	*137*	*46*	*46*	*58*	*41*

Source: Research done by the authors

As seen in Table 7, the most common KAMs in Croatia have to do with impairment (20.86% in 2018, 18.98% in 2019) and in the Republic of Srpska (41%) and the Federation Bosnia and Herzegovina, with revenue recognition (21% in 2018, 31% in 2019). Revenue recognition also takes up a significant percentage in Croatia (19%), as well as inventories (14.39% in 2018, 7.30% in 2019). Other notable mention for Bosnia and Herzegovina are expected credit losses. Impairments include the impairments of brands, goodwill, intangible assets, loans granted to subsidiaries, investments in subsidiaries, receivables, property, plant and equipment, tourist facilities, and others.

6. Conclusions

The purpose of implementing IAS 701 is to make the work of auditors more transparent by addressing KAMs. In this way, the users of an audit report obtain additional information on the matters that the auditor found to be the most important in an audit of the financial statements of a reporting period.

In our paper, we investigated whether the audit reports for listed companies in Croatia and Bosnia and Herzegovina, as countries obliged to apply IASs, include a section on KAMs, given that the IASs require disclosure of at least one KAM for listed companies. The analysis of audit reports for list-

ed companies in Croatia showed that only a small percentage (5.15% in 2018 and 8.16% in 2019) of the reports do not have a section on KAMs, whilst that percentage exceeded 40% for the stock exchanges in the two Bosnia and Herzegovina entities. According to research by Tušek & Ježovita (2018), in the first year of applying IAS 701 in Croatia, the percentage was 18%, but it dropped over time. Although a slight decrease in the number of audit reports without KAMs may be observed in Bosnia and Herzegovina as well, it is still a very high number. Based on our research, one can conclude that audit firms for the two observed stock exchanges in Bosnia and Herzegovina do not enhance transparency of their reports by reporting KAMs, as explained in Alves Júnior & Galdi (2020). The lack of KAMs in audit reports of listed companies also casts doubt on the quality of those reports (Ittonen, 2012).

One should also point out that in Croatia 95% of the listed companies have publicly disclosed their financial statements and audit reports, whilst in the Republic of Srpska 50% and in the Federation of Bosnia and Herzegovina 34% of them have done so. Local laws in Bosnia and Herzegovina require public disclosure of financial statements and audit reports but many listed companies still do not fulfil the obligation. This deprives report users of the information they need to make the necessary business decisions and assess the management's responsibility for the resources allocated thereto. Denied important information make the users, primarily creditors and investors, make poor quality decisions.

A comparison of the ratio between the audit reports prepared by the Big Four and the reports made by other audit firms reveals that most audits in Croatia fall within the first category, whilst 75% of all audits in Bosnia and Herzegovina have been performed by other audit firms. The difference made us curious as to whether there is also a discrepancy in the number of KAMs included in audit reports between the two countries. All audit firms in Croatia have disclosed at least one KAM, as shown by the *Deloitte* survey (2017), and both the Big Four and other audit firms present the same number of KAMs. By contrast, in Bosnia and Herzegovina, the Big Four also published at least one KAM but other audit firms disclosed less than one, on average, which was confirmed by the Ferreira & Morais research (2020). Hence, in the case of Bosnia and Herzegovina, there are notable differences between the two groups of audit firms. Additionally, there are discrepancies in the number of KAMs disclosed by other audit firms in Croatia as opposed to Bosnia and Herzegovina, but no such differences exist between the two countries when it comes to the number of KAMs disclosed by the Big Four. Other studies point to, on average, a higher number of KAMs per an audit report than found in our research. For example, the study conducted by Li (2020) shows an average of two KAMs disclosed per an auditor's report.

The most common KAMs have to do with impairment, revenue recognition, inventory valuation, and expected credit losses for financial institutions. These KAMs have also been identified as most common in the study by Li (2020). However, one can also see some differences in the prominent types of KAMs between the two observed countries. In Croatia, KAMs related to business combinations, liabilities and estimates also stand out, whilst KAMs related to credit losses rank highly in Bosnia and Herzegovina.

Having analysed the two developing countries that share a past but one of them is an EU Member State today and the other is not, we obtained different results. Based on audit reports, a significant contribution of this paper is reflected in the analysis of the application of IASs 701 in the countries where IASs make a mandatory audit framework, the behaviour of the Big Four and other audit firms, and transparency of listed companies and transparency of the work of auditors.

As a limitation of the paper, one should mention the sample structure for the Republic of Srpska and the fact that only the audit reports for the last two years were considered since IAS 701 has been in force since 2018. It would be highly useful to further explore the types of opinions given for financial statements and how many KAMs are disclosed in modified opinions.

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DIGITAL ECONOMY – A BIBLIOMETRIC ADDITION TO UNDERSTANDING AN "UNDEFINED" DOMAIN OF THE ECONOMY

Abstract

Purpose: The definition of the digital economy changes depending on the time period the definition comes from and the prevailing technology of that period, from the Internet to advanced robotics or artificial intelligence. The purpose of this paper is to identify the core terms, give a definition of the digital economy, identify the most influential journals, authors and documents that deal with the topic and provide an overview of the development of academic literature over the years.

Methodology: 293 documents related to the term "digital economy" were retrieved from the Scopus database. By using citation, co-citation, bibliographic coupling analysis and co-occurrence of the keywords, this paper identifies a list of the most influential journals, authors and documents in the field of digital economy. The analysis was conducted by using the VOSviewer tool. An in-depth analysis of the documents was used to prepare an overview of the definitions of the digital economy.

Results: The research proves inconsistency of the definition and context of the digital economy as well as a significant impact of a small number of authors and journals in the area under study. Keyword analysis shows that the term digital economy is related not to macroeconomic terms but to more specific industrial terms.

Conclusion: Guidelines are provided for future scientific research to fill the gaps in the definition and scope of the digital economy.

Keywords: Digital economy, bibliographic analysis

1. Introduction

The digital age is transforming every aspect of business. We communicate with images, produce by advanced robotics and 3D printers, transport by drones, pay by means of mobile payment applications, etc. The speed of information flow and its availability through the application of, among other things, the Internet of Things and cloud computing, enable companies to access new ideas. In the fast-paced world of innovations, digital technologies create many benefits that affect economic growth creating the digital economy. According to Chen (2020), the digital economy has "substantially reduced market friction but also posed new challenges for the efficient functioning of markets".

There are a large number of definitions of the digital economy that are not harmonized in practice, the scope and method of measurement. Digital Croatia (2014) defines the digital economy as a "newer form of economy based on digital technologies and as such represents one of the most attractive trends and opportunities for growth". According to Spremić (2017), "the concept of digital economy serves as an umbrella term for new business models, products and services based on digital technologies as the basic business infrastructure". Chen (2020) defines the digital economy as all the economic activities based on information and communication technologies, but Kupenova et al. (2020) narrow it down to "conducting business through markets based on the Internet and the WWW". A broader definition is given by Miethlich et al. (2020), who explained the digital economy as a set of social relations that "arise in connection with the production, sale and consumption of digital goods and services or with the use of digital infrastructure". By analyzing documents included in the research, we realized that in recent documents the term "digital economy" is often used to define the field in which the documents are published, although the term digital economy is generally not elaborated in the documents. According to Rustamof et al. (2021), "the lack of definition of the digital economy is the obstacle to discussing many issues", so this research has two goals: to systematize academic contributions and knowledge about the observed field of digital economy and by using bibliometric analysis to identify the most influential authors, journals and documents in the analyzed area. The initial hypotheses of the paper are:

1. Research of keywords related to the term "digital economy" will show a strong connection between the digital economy and macroeconomic concepts such as GDP, macroeconomics, economic development, economy growth, etc.
2. The field of the digital economy is not defined clearly and unambiguously.

2. Literature overview

Since the digital economy still has an insufficient share in GDP, Ajeti (2003) emphasizes that at the same time two different economies adapt and change according to the needs of society: "mass economy (the economy of the industrial age that still exists due to mass consumption of material goods, accumulation of wealth and economies of scale and mass exploitation of raw materials and energy)" and the so-called information economy that "uses much less energy, raw materials and labor, and achieves better effects due to knowledge".

Ajeti (2003) stresses that although certain countries have significantly advanced in the development of the digital society, in some countries, and even within these countries and/or societies, there is an "old" economy which a certain part of the population relies on and which must not be neglected but gradually developed in line with the availability of technology and education of the workforce. Nitescu (2016) also distinguishes between the traditional and digital economies and further explains that the digital economy differs from the traditional economy in a wide range of features. Although the opinion that most frequently appears in the literature (Huggins, 2008; Nguyen & Pham, 2011) is that richer countries have already reached a mature stage of the digital economy, this is usually not the case in practice. Ojanpera et al. (2018) argue that countries basically have an economy affected by various variations of natural resources, material factors, and the level and application of knowledge, and that the degree of the digital economy

does not depend solely on a country's wealth. The measurement framework, the accuracy of statistics and their availability in certain regions can give the wrong impression of the level of development of the digital economy (Bukht & Heeks, 2017). Some research studies (Dewan & Kraemar, 2000; Pohjola, 2002; Yousefi, 2011) even show a negative impact of digital technology on the economic development of the country. Digital technologies have a significant impact on all areas of the "old" economy and create a basis for future faster growth of the digital economy. Barmuta et al. (2020) researched the main difficulties for the organizational restructuring process in digital format and identified the main functional area of changes. Rrustemi et al. (2020) argued that development of crypto-currencies has brought new opportunities in "efficient, borderless and secure flows of capital". Novikov (2020) analyzed the use of data science and big data technology in reducing downtime to reduce costs.

Nesterenko et al. (2020) discussed the possibility of using cloud computing and a large database in agricultural production, Resznik et al. (2020) explored the ways to "improve the fight against money laundering in the digital economy", and the Shibata (2020) explored "gig work", autonomous nature of this kind of employment and the benefits that "gig workers" can provide when solving specific issues.

Some authors list the basic characteristics or concepts which the digital economy relies on (Tapscott, 1996; Nitescu, 2016; Spremić, 2017; Ergunova et al., 2019) based upon which it can be concluded that the digital economy is characterized by knowledge, globalization, digital business models, the speed of change, supporting infrastructure, integration of independently developed technologies and the use of digital platforms. In addition to the benefits, the digital economy also carries certain challenges. Risks associated with information technology are technical errors, obsolescence, disloyal partners, business process downtime and a negative impact on reputation, with inadequate investments stressed as one of the biggest risks.

Friedrich et al. (2011) researched Eurostat data and tried to define the extent to which digitization changes certain industries, and created the Industry Digitization Index, which consists of the following four factors: input, production, output and infrastructure. The authors concluded that sectors that are the leaders in the process of digitization have a unique opportunity to build a lasting market advantage. "Digital Darwinism" (Solis & Szymanski, 2016) favors companies that invest in change. Although such transformations require large resources and time, those who treat this process as long-term will have the expected return on investment, as opposed to those who expect immediate results.

3. Research methodology

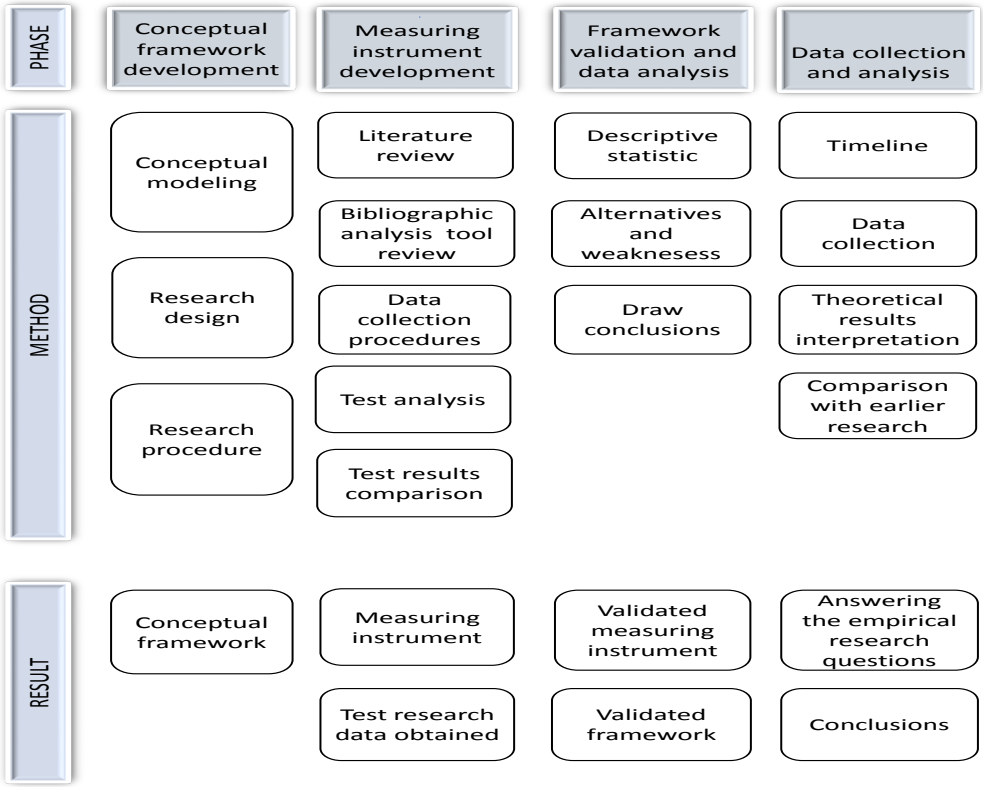
The research was conducted by using author keywords and abstracts in the Scopus database. Although a certain bias of the author in the use of author keywords is possible, it was considered that these are the terms that best describe the content of the document. The term "digital economy" was used as a search keyword (Negroponte, 1995; Šonje, 2001; Nitescu, 2016).

Additional emphasis was placed on Scopus categories (Economy, Business, Management, Operations Research and Management Science). It is considered that the contextualization of the term "digital economy" should refer as a broader term to the concepts of economy, state, industry, etc., so we wanted to exclude documents that deal with specific categories under the digital economy topics. We obtained data on 293 documents included in the analysis.

Figure 1 shows the methodology process. Data retrieved from the Scopus database was refined according to the following command:

(KEY ("digital economy") AND ABS ("digital economy")) AND (LIMIT-TO (DOCTYPE, "ar")) AND (LIMIT-TO (SUBJAREA, "BUSI") OR LIMIT-TO (SUBJAREA, "SOCI") OR LIMIT-TO (SUBJAREA, "ECON")) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, "j"))

Figure 1 Research protocol review



Source: Author, March 2021

In addition to the analysis of representation by years and countries, the VOSviewer program was used for the analysis of data obtained from the Scopus database (Van Eck & Waltman, 2010).

Bibliometric analysis of journals, documents, authors, co-authorship of countries and co-occurrence of author keywords, index keywords and total keywords was performed. The aim was to determine the difference between author and index keywords as well as to identify the terms that are most frequently associated with the term digital economy. Additional data on these analyses can be found in Van Eck & Waltman (2010).

The results presented in this paper were obtained by using citation, co-citation, bibliographic coupling and co-occurrence analysis. According to Surwase et al. (2011), co-citation analysis "involves tracking pair of papers that are cited together in the source articles". The mutual connection between two documents is stronger when more documents cite both documents at the same time. According to Caputo et al. (2021), this connection provides an insight into the documents that are considered to be the foundations of the field under study.

Kessler (1963) first introduced the term bibliographic coupling. The analysis determines the relationship between two members that cited the same document (Ajibade & Mutula, 2018).

According to Kessler (1963), bibliographic coupling occurs when two documents reference a common third document in their bibliographies. The bibliographic coupling strength increases with an increase in the number of references they have in common (Surwase et al., 2011). In the sum of strengths, this analysis represents the importance of the document network because the document with the highest strength is placed in the center of the network and it has the largest number of cita-

tions related to other documents. The information shows the network of documents, authors or journals.

The co-authorship network defines organizations, authors or countries that establish cooperation, while according to Callon et al. (1983), co-occurrence is a form of keyword analysis that investigates their connection and the conceptual structure of the field.

The research is presented in overview tables. Overlay visualization enabled by the program is used in one case. Network visualization is determined by the circles representing the analyzed members connected by links of certain strength and in certain clusters. The size of the circle depends on the importance of the observed element and the distance referring to their connection - the closer they are, the stronger their connection. Overlay visualization shows the analyzed members in the same position, but the colors (from blue to yellow) of the member itself are determined depending on the period of time in which the document was published. The later the analyzed document is published, the closer its color is to yellow. An in-depth analysis of the content of specific documents was used to determine a different definition of the term digital transformation.

4. Results

4.1 Source analysis

Journals were analyzed from three perspectives, i.e. analysis of the most cited journals, analysis of the journals considered to be the basis of the analyzed field, and analysis of the journals with the largest network. For citation analysis, we selected journals that published at least two documents (Ferreira, 2018) and a set of 48 journals with 162 documents was obtained.

Fifty documents (30.8%) were published in the ten most cited journals. Out of the total number of citations (979), 412 (42%) and 600 (61.2%) citations refer to the 5 and 10 most important journals, respectively. This clearly shows a strong impact of a small number of journals on the field under study. The average number of citations per journal is 20.

The largest number of citations is related to MIS Quarterly (113), Entrepreneurship and Sustainability Issues (98), Management Science (82), Computer Law and Security Review (64) and the European Research Studies Journal (55).

Co-citation analysis shows a slightly different order. As a condition for analysis, 10 citations per journal were defined, so out of the total number of sources (6,554), only 73 met the said condition. Only 5 journals have more than 30 citations and the first 10 according to citations (0.15% of the total number of analyzed journals) account for 30.8% of all citations. The first 30 journals according to citations (0.45% of the total number of analyzed journals) account for 60.37% of all citations. The journals that have the highest link strength and thus the most significant impact on the digital economy concept are MIS Quarterly (1187), Information Systems Research (584), Social Psychology Quarterly (564), Computers in Human Behavior (495), and the European Research Studies Journal (490).

Bibliographic coupling analysis was defined on a minimum of two documents per journal (Ferreira, 2018) and out of the 187 sources, 48 met this condition. This analysis shows that the following journals were at the core of the problem with the strongest network referring to the topic: the European Research Studies Journal, Technological Forecasting and Social Change, Technology in Society, Entrepreneurship and Sustainability Issues and Espacios.

It can be seen in the table below that the theoretical basis for the digital economy concept is most frequently found in journals covering the fields of business and management. Exceptionally important journals for researching the topic can be noticed in citation analysis, with 0.45% of journals having a 60.37% share in citations.

The only journal ranked in the top five journals by all criteria is the European Research Studies Journal, with 9 published documents (6.11 citations per document). At the same time, MIS Quarterly has 2 published documents and 56.5 citations per document. Therefore, when analyzing the field of the digital economy, special attention should be paid to the documents published in these journals. To understand the impact of an individual journal on the observed topic, it is extremely important to conduct all three analyzes.

Although some journals are not among the most cited journals, bibliographic coupling analysis can show that the importance of documents within such journals in the community dealing with the same topic is extremely high.

Table 1 Comparison of citation, co-citation and bibliographic coupling of journals

	Citation analysis			Co-citation analysis		Bibliographic coupling	
	Source	**Documents**	**Citations**	**Source**	**Total links strength**	**Source**	**Total links strength**
1.	Mis Quarterly	2	113	Mis Quarterly	1,187	European research studies journal	63
2.	Entrepreneurship and Sustainability Issues	6	98	Information systems research	584	Technological forecasting and social change	59
3.	Management science	2	82	Social psychology quarterly	564	Technology in society	52
4.	Computer law and security review	5	64	Computers in human behavior	495	Entrepreneurship and sustainability issues	50
5.	European research studies journal	9	55	European research studies journal	490	Espacios	36
6.	International journal of economics and business administration	3	52	Telecommunications policy	480	Quality - access to success	12
7.	Technovation	2	36	International journal of information management	327	International journal of economics and business administration	11
8.	Decision support systems	2	35	Management science	313	Journal of environmental management and tourism	8
9.	Espacios	15	34	Government information quarterly	295	Big data and society	6
10.	Technology in society	4	31	Communications of the acm	283	Economic analisys	6
11.	Technological forecasting and social change	5	30	Harvard business review	274	International journal of supply chain management	6
12.	Telecommunications policy	2	30	Journal of entrepreneurship education	273	Journal of entrepreneurship education	6
13.	Foundations of management	2	29	Espacios	248	Polish journal of management studies	6
14.	Computers and security	2	28	Journal of business research	245	Technovation	5
15.	European journal of social theory	2	27	Management science	240	Business informatics	4

Source: Author, March 2021

4.2 Author analysis

In citation analysis, the authors are presented individually, separately from the group of authors with whom they share the specific document included in the analysis. One author can publish several documents together with various authors, so each of their documents is counted as one document by a specific author, and quotations from a specific document are added there.

A criterion of at least one document and ten citations per author was selected for citation analysis, which amounted to 133 out of the 760 authors fulfilling the condition. These authors were cited 3,273 times, while only 59 authors were cited more than 20 times.

The most cited 10 authors (7.51%) were mentioned in 24.2% of all citations, whereas 30 authors (i.e. 22.5% of all authors) in the analysis accounted for 47.14% of all citations.

Co-citation analysis defines authors who represent the foundations of the topic under study. A minimum threshold of 10 citations per author was defined (Ferreira, 2018). Using a limit of 20 citations, out of the total number of authors (12,828) only 12 were selected, so the citation limit was adjusted to a smaller number (10) to conduct deeper analysis of the list. Forty-three authors, of whom Watanabe and Neittaanmaki are the most significant ones dealing with the analyzed topic (Table 2), defined such a limitation. The fact that by limiting the citations to 20 only 12 authors are obtained, shows that although the topic was accepted and developed by a large number of authors (12,828), several of them represent the foundation to which most of the later documents are connected.

In order to conduct bibliographic coupling analysis, the limit is set to a minimum of one document and one citation per author. Based on this limit of 760 authors, 440 authors met the condition. According to the analysis, although Gordon and Loeb are the most cited authors, Neittaanmaki, Tou, and Watanabe are the authors who are at the center of the citation network and are most frequently embedded in conversation.

Table 2 Bibliographic analysis of authors

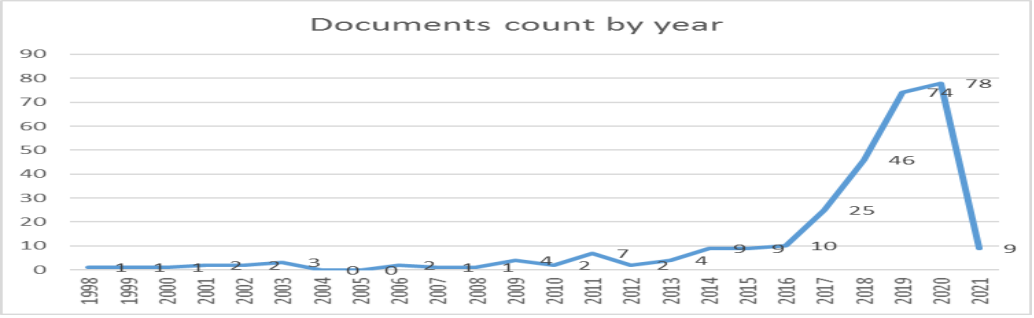
	Citation		Co-citation		Bibliographic coupling	
	Author	**No. of citations**	**Author**	**Total link strength**	**Author**	**Total link strength**
1.	Gordon, L.A.	112	Watanabe, C.	1,748	Neittaanmaki, P.	942
2.	Loeb, M.P.	112	Neittaanmaki, P.	1,409	Tou, Y.	942
3.	Sohail, T.	112	Naveed, K.	1,217	Watanabe, C.	942
4.	Geoffrion, A.M.	91	Tou, Y.	748	Kauffman, R. J.	778
5.	Krishnan, R.	82	Brynjolfsson, E.	647	Kim ,D.J.	778
6.	Polyakova, A. G.	65	Akhmetshin, E.M.	387	Lang, K.R.	778
7.	Grimes, S.	64	Mcafee, A.	343	Li, R.	778
8.	Kierkegaard, P.	57	Tapscott, D.	224	Naldi, M.	778
9.	Loginov, M.P.	50	Polyakova, A. G.	217	Boychenko, O.V.	510
10.	Serebrennikova, A.I.	50	Goloshchapova, I.V.	207	Burkaltseva, D.D.	510
11.	Thalassinos, E.I.	50	Vornokova, O.Y.	194	Sivash, O.S.	510
12.	Akyuz, G.A.	47	Kamolov, S.G.	166	Zotova, S.A.	510
13.	Rehan, M.	47	Zhang, I.	130	Carter, M.	478
14.	Neittaanmaki, P.	41	Heeks, R.	112	Grover, V.	478
15.	Tou, Y.	41	Venkatesh, V.	110	Petter, S.	478
16.	Watanabe, C.	41	Fountain, J.E.	106	Thacher, J.B.	478
17.	De Cock, C.	38	Davis, F.D.	99	Naveed, K.	473
18.	Pogodina, T.V.	38	Perez, C.	95	Bakhvalov, S.Y.	414
19.	Graham,G.	36	Mykland, P.A.	90	Kuznetsova, I.G.	414
20.	Li, F.	36	Fuchs, C.	86	Levichev, V.E.	414

Source: Author, March 2021

4.3 Document analysis

Document analysis shows that the concept of the digital economy has been written about since 1998, and the peak was reached in 2019 and 2020. In the last 5 years, 82% of all documents included in this analysis have been published, which shows how interesting the topic has become.

Figure 2 Documents per year



Source: Scopus, March 2021

The requirement for citation and bibliographic coupling analysis of documents is set at a minimum of five citations per author. Of 293 authors, 78 met the requirement in citation analysis. In bibliographic coupling analysis of 293 documents, 78 met the condition.

The most important documents according to citations are the following:

1. Gordon, L. A. et al. (2010). Market value of voluntary disclosures concerning information security.
2. Grimes, S. (2003). The digital economy challenge facing peripheral rural areas.
3. Kierkegaard, P. (2011). Electronic health record: Wiring Europe's healthcare.
4. Polyakova, A. G. et al. (2019). Design of a socio-economic processes monitoring system based on network analysis and big days.
5. Geoffrion, A. M. & Krishnan, R. (2003). E-business and management science: Mutual impacts (Part 1 of 2).

A document comparison table shows that the most cited documents are not the documents that are most networked within the topic. Documents with the highest link strength according to bibliographic coupling analysis are as follows:

1. Ali, M. A. et al. (2018). An empirical investigation of the relationship between e-government development and the digital economy: the case study of Asian countries.
2. Zhao, F. et al. (2015). E-government development and the digital economy: a reciprocal relationship.
3. Watanabe, C. et al. (2018). Measuring GDP in the digital economy: Increasing dependence on uncaptured GDP.
4. Watanabe, C. et al. (2018). A new paradox of the digital economy - Structural sources of the limitation of GDP statistic.
5. Geoffrion, A. M. & Krishnan, R. (2003). E-business and management science: Mutual impacts (Part 1 of 2).

The 20 most significant authors by citation and bibliographic coupling are presented in Table 3, where the difference can be noticed. Although the document by Ali et al. (2018) is not the most cited one, it is the most networked document in the discussion. The differences in the documents confirm the importance of comparative bibliometric analysis when it comes to establishing an understanding of the impact on the field under study.

Furthermore, the publication year of the document has an impact on the number of citations, so it is extremely important to either normalize citations that balance the impact of the publication year of the document or look at bibliographic coupling analysis to search for more recent, interesting documents.

Table 3 Comparison of citation and bibliographic coupling of documents

	Citation		Bibliographic coupling	
	Document	**No. of citations**	**Document**	**Total links strength**
1.	Gordon, L.A. (2010)	112	Ali, M.A. (2018)	44
2.	Grimes, S. (2003)	64	Zhao, F. (2015)	39
3.	Kierkegaard, P. (2011)	57	Watanabe, C. (2018a)	35
4.	Polyakova A.G. (2019)	50	Watanabe, C. (2018b)	33
5.	Geiffrion, A,M. (2003b)	50	Geoffrion, A.M. (2003a)	19
6.	Akyuz, G.A. (2009)	47	Geoffrion, A.M. (2003b)	19
7.	De Cock, C. (2000)	38	Kuznetsova, I.G. (2018)	16
8.	Li, F. (2016)	36	Ivanova, V. (2019)	14
9.	Cronin, B. (2001)	35	Oumlir, R. (2018)	13
10.	Geoffrion, A.M. (2003a)	32	Burkaltseva, D.D. (2017a)	11
11.	Afonosova, M.A. (2019)	26	Burkaltseva, D.D. (2017b)	11
12.	Kostakis, V. (2016)	25	Olleros, X. (2008)	9
13.	Ivanova, V. (2019)	24	Kologlugil, S. (2015)	7
14.	Watanabe, C. (2018a)	24	Polyakova A.G. (2019)	6
15.	Veselovsky, M.Y. (2018)	22	Lee, S.M. (2011)	6
16.	Burkaltseva, D.D. (2017b)	22	Geoffrion, A.M. (2002)	6
17.	Zhao, F. (2015)	22	Glotko, A.V. (2020)	5
18.	Vlasov, A.I. (2019)	21	Curran, D. (2018)	5
19.	Spiekermann, S. (2017)	21	Mueller, S.C. (2017)	5
20.	Kim, B. (2002)	21	Teng, C.I. (2006)	5

Source: Author, March 2021

4.4 Keyword analysis

Co-occurrence refers to the case where two keywords appear together in the analyzed documents and it enables researchers to define the focus of the analyzed topic. In this way, a cluster is formed by the words that best describe it and the connections between them. The research was conducted on three levels. The author, index, and total keywords were used to single out terms that are in all cases associated with synonyms for the digital economy. For all three variants of keyword research, a minimum condition of five occurrences was set, with 21 author keywords excluded from 1,176 keywords. Of the 490 indexed keywords, only 10 meet the condition. Out of the 1,531 total keywords, 33 meet the condition. The keywords are shown in Table 4.

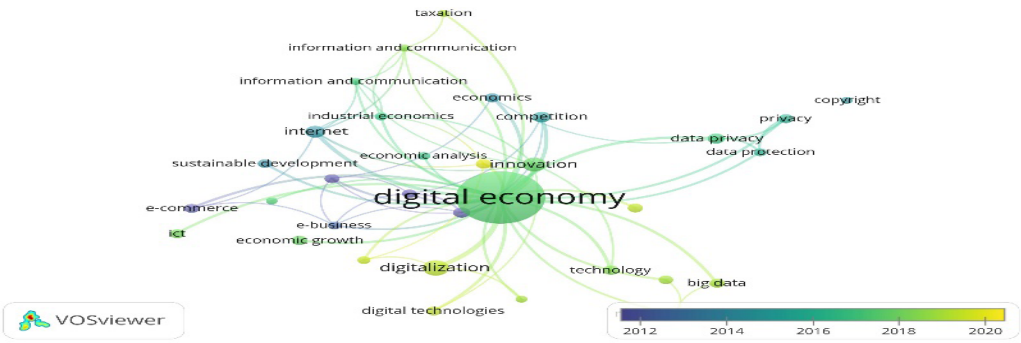
Table 4 Keyword comparison

	Author keywords	No. of occurences	Total link strength	Index keywords	No. of occurences	Total link strength	Total keywords	No. of occurences	Total link strength
1.	Digital Economy	242	132	Digital Economy	41	45	Digital Economy	271	243
2.	Digitalization	23	32	Electronic Commerce	9	17	Innovation	19	46
3.	Innovation	15	24	Marketing	7	15	Digitalization	23	41
4.	Internet	10	16	Economics	7	14	Internet	14	36
5.	Digitization	7	15	Industrial Economics	6	13	Electronic Commerce	10	29
6.	Big Data	8	14	Data Privacy	8	10	Data Privacy	10	28
7.	E-commerce	8	14	Competititon	5	10	Digitization	9	26
8.	Economic Growth	8	14	Innovation	5	10	Marketing	7	24
9.	Technology	8	14	Economic Analysis	6	7	Economic Growth	9	23
10.	Artificial Intelligence	6	13	Sustainable Development	6	5	Privacy	8	23
11.	Information Tecnologies	6	13				Industrial economics	6	23

Source: Author, March 2021

Overlay visualization of total keywords shows that in recent years, depending on the focus of the authors, the words digitization, big data, innovation or digital technologies are used more frequently compared to e-commerce and e-business that were used in earlier documents. Figure 3 also shows great interest that prevailed 4-6 years ago in the field of data privacy and data protection. This shows that the focus of researchers is shifting to new digital technologies and research into the elements and development of the digital economy.

Figure 3. Total keyword overlay visualization



Source: VOSviewer analysis, 2021

It can be noted that most keywords could not be defined as a macroeconomic term, but the digital economy is associated with digital terms such as digitalization, innovation, the Internet and new technologies, which refutes the thesis that the digital economy is associated with macroeconomic terms. At the same time, index keywords focus the area on marketing, economics, data protection, etc. Although this would be expected due to the pronounced impact of the digital economy on society, it can be concluded that it is still unclear what the digital economy encompasses, how it is measured and what its impact is on the overall economy. If we also look at the titles of articles obtained by keyword research in the Scopus database, we can see that most articles deal with a specific field of industry instead of the notion of the digital economy and its impact on the economy as a whole. It is also interesting to note that the keywords have no synonyms for the digital economy: Industry 4.0, knowledge economy, etc.

5. Results and discussion

The topic of the digital economy has been present in research for more than 20 years. However, the interest of the research community in the field under study has grown significantly in recent years. Despite the fact that a large number of authors (12,828 cited) deal with this field, bibliographic analysis shows that a very small number of authors (59) were cited more than 20 times (22.5% of all authors in the analysis account for 47.14% of all citations). However, although Gordon, Loeb, and Sohail are the most cited authors, co-citation analysis shows that Watanabe and Neittaanmaki are the authors who are embedded in the very foundations of the topic.

Thereby, MIS Quarterly is the most cited journal in which documents have been published that form the basis for the development of the topic of the digital economy. Abstract analysis shows that a very small number of documents that use the term digital economy in keywords and abstracts actually refer to this field, i.e. define the digital economy and its scope. Of the five most cited documents, only one refers to the digital economy in the title.

According to Škuflić & Dizdarević (2003), there is no single definition of the digital economy. The terms new economy (Šonje, 2001; Mann & Rosen, 2001; Atkinson & Gottlieb, 2001; Tapscott, 1996; Perkov, 2019), information economy (Šonje, 2001; Ajeti, 2003) knowledge society (Atkinson, 2000; Drašković, 2010), and information society (Krajina & Perišin, 2009) are also used. Škuflić & Dizdarević (2003) reduce different definitions of the digital economy under the common denominator of economic growth with "intensive involvement of information and communication technology (ICT sector) in all areas of the economy and society which causes changes on the supply and demand side".

It is important to note that the definition of the digital economy changes with time it is given in and the prevailing technology of that time, from the Internet to advanced robotics and artificial intelligence. We are witnessing the rapid development of technology, so today's definitions will become obsolete in the future due to the emergence of some new technologies that will mark the time in which the digital economy will be defined. Earlier definitions (Tapscott, 1995) focused mainly on the Internet explaining its importance during the 1990s. With the development of digital technologies, the digital economy is later explained by means of computers and mobile communications (Šonje, 2001), IOT, social networks, sensors (Digital Croatia, 2014), big data, cloud computing, robotics, artificial intelligence - depending on the time the definition is given in.

Definitions of the digital economy can be divided into three groups. The first group (Atkinson, 2000; Ajeti, 2003; Drašković, 2010) describes knowledge as one of the key factors, i.e. in the current phase of digital technology development, it puts people and their knowledge in the foreground. The digital economy has emerged based on knowledge and due to the development of knowledge, it will continue to develop. According to Atkinson (2000), the digital economy is "an economy based on knowledge and ideas about where the key to improving living standards and creating new jobs is, to the extent that innovative ideas and technological changes are incorporated into products, services and production processes".

Ajeti (2003) concludes that "education is becoming crucial for the functioning of modern knowledge-based information societies and that the knowledge economy uses knowledge as the best quality goods/assets, as a means of production and guarantees of competitive advantages in the market".

Drašković (2010) also puts people at the center of the definition and believes that the knowledge economy "is formed and expanded on the basis of knowledge as a factor that is impossible to replace with other factors. This knowledge is transformed into goods and income in most economic activities, not only in those related to advanced technologies" (Drašković, 2010).

The second and largest group (Lane, 1999; Šonje, 2001; Mann & Rosen, 2001; Digital Croatia, 2014; Knickrehm et al., 2016) includes definitions that are based on technology as a key driver of development with the aim of achieving growth and profit. Such "technological" definitions do not speak of a human as the initiator and user of the values of the digital economy.

Šonje (2001) considers that "new economy (e-economy or information economy) terms are terms that describe new products, services and markets related to the use of computers and mobile communications and especially the Internet".

Mann & Rosen (2001) define the new economy as "an economic model based on interrelated policies aimed at achieving sustainable long-term growth, with related information technologies drastically increasing the amount and value of information available to individuals, businesses, markets and governments, enabling them to make a more efficient choice and achieve superior results". Knickrehm et al. (2016) consider that "the digital economy is the share of the total economic product that arises from a certain number of digital inputs. Digital inputs include digital skills, digital equipment (hardware, software, and communication equipment), digital goods and services used in the production system. Such broad measures reflect the foundations of the digital economy." Table 5 shows the development and inconsistency in relation to the focus of the definition of the digital economy over time.

Table 5 Digital economy definitions

Source	Definition	Focus
Tapscott (1995)	Economy based on digital computer technologies	Technology
Lane (1999)	Convergence of computer and communication technology to the Internet and the resulting flow of information and technology that stimulates all e-commerce and huge organizational changes	Technology
Atkinson (2000)	A knowledge-based economy and ideas about where the key to improving living standards and job creation to the extent that innovative ideas and technological changes are incorporated into products, services and production processes	Knowledge and people
Šonje (2001)	New economy (e-economy or information economy) terms that describe new products, services and markets related to the use of computers and mobile communications, and especially the Internet	Technology
Mann and Rosen (2001)	An economic model based on interrelated policies aimed at achieving sustainable long-term growth, with connected information technologies drastically increasing the amount and value of information available to individuals, companies, markets and governments, enabling them to make more efficient choices and achieve superior results	Technology
Škuflić and Dizarević (2003)	Economic growth with intensive involvement of information and communication technology (ICT sector) in all areas of the economy and society, which causes changes on the supply and demand side	Technology
Ajeti (2003)	Education is becoming crucial for the functioning of modern information societies based on knowledge. Knowledge economy uses knowledge as the best quality goods / assets, as a means of production and a guarantee of competitive advantages in the market	Knowledge and people
Digital Croatia (2014)	A newer form of economy based on digital technologies, and as such represents one of the most attractive trends and opportunities for growth	Technology

Source	Definition	Focus
European Parliament (2015)	The digital economy is a complex structure of several levels interconnected by an almost infinite and ever-growing number of nodes. Interconnected platforms provide access to end users through a number of routes, which makes it difficult to exclude certain players, i.e. competitors	Connectivity
Hržica (2016)	The digital economy is based on the added value generated by new technologies	Technology
Rouse (2016)	World Network of Economic Activities Enabled by Information and Communication Technologies (ICT)	Connectivity
Knichrem et al. (2016)	The digital economy is the share of the total economic product that results from a certain number of digital inputs. Digital inputs include digital skills, digital equipment (hardware, software and communication equipment) and digital goods and services used in the production system. Such broad measures reflect the foundations of the digital economy	Technology
Dahlman et al. (2016)	The digital economy is a combination of several general technologies and a range of economic and social activities carried out by people over the Internet and related technologies	Technology
Spremić (2017)	The term digital economy serves as an umbrella term to denote new business models, products and services based on digital technologies as the basic business infrastructure	Technology

Source: Author, March 2021

The main difference between the definitions of the first and the second group of authors is that the first group assumes knowledge (people) as a basis for the development of the digital economy that should improve the living standards of the population. Educated and creative, people are the ones who make a difference. In contrast, the second group explains the digital economy by focusing on technology as the main feature and business performance as the target output.

The third group of definitions consists of definitions (European Parliament, 2015; Rouse, 2016) that put connectivity at the center or as a basic characteristic of the digital economy. According to the definition of the European Parliament (2015), "the digital economy is a complex structure of several levels interconnected by an almost infinite and ever-increasing number of nodes.

Interconnected platforms allow access to end-users through a number of routes, which makes it difficult to exclude certain players, i.e. competitors". Rouse (2016) defines the digital economy as a global network of economic activities enabled by information and communication technologies (ICT). According to these definitions, it can be concluded that the backbone of the digital economy is hyperconnectivity, which implies the growth of interconnectedness of people, organizations and devices through the Internet, mobile technologies and the Internet of Things.

In order to determine the definition of the digital economy, it is also important to discuss the social character of the digital economy, which is still largely described by the development of digital technologies and very little by the role of people in such an economy. How is the digital economy defined, what are its key elements and how does it differ from the "old economy"? Most of these authors use the terms knowledge, technological change, education, long-term growth, and connectivity. However, the same terms were used during the industrial revolutions in both earlier definitions of the economy and for the non-digital economy. Knowledge, education and technological change have been key characteristics at every stage of economic development. The digital economy is characterized by something else. Industrialization has brought machines to humanity that have been used to advance society but were controlled by people. The digital economy brings, among other things, big data, artificial intelligence, advanced robotics, and the role of man is still un-

defined at this stage of development of such a society. Today, people still live in a divided economy between the "outdated" and the "digital" economy and use the benefits of both. However, could one really imagine what the world would look like at the time when the concept of the "old" economy would be completely abandoned?

Could one imagine a fully digitalized world governed by artificial intelligence in which, due to advanced robotics, the role of man would become secondary? Would we become unnecessary or provide a way to manage systems?

These are the questions that were not asked during the industrial revolutions because we had man-controlled machines. Although it seems that we have come a long way in the development of digital technologies, we should be aware that we are at the very beginning. Therefore, it is especially important to emphasize once again that the previously analyzed definitions of the digital economy are based on what is known today and not on what will be known tomorrow.

6. Conclusion

The digital economy has become an unavoidable topic in recent literature, which has been reflected in the significant growth in the number of documents that analyze the impact of the digital economy on a wide range of thematic clusters. This document significantly contributes to the understanding of the term digital economy, systematizing and analyzing various definitions of the digital economy, including the time impact of technology development on the definitions.

Bibliographic analysis shows a significant influence of a small number of journals, documents and authors on the field under study. The importance of bibliographic analysis is especially reflected in determining the foundations of the field under study. Although some authors are top-cited authors, co-citation and bibliographic coupling analyses show that some other authors are embedded in the very foundations of the field or, that they are much more networked in the discussion. A similar conclusion can be drawn for journals and documents.

However, although certain journals are on the list of the most cited, analysis of the number of documents published in journals largely shows both the quality of the document itself and the rigor of the selection of documents by the journal. In specific cases, by using a comparison of the number of documents in the journal and the number of citations of the journal, it can be concluded that the quantity of papers does not necessarily contribute to the quality of the journal itself.

Bibliographic analysis did not confirm hypothesis 1. The digital economy in keywords is not related to macroeconomic concepts but to certain professional concepts of information technology. Despite a general understanding of the digital economy as a macroeconomic concept, it is not explained in the literature on such principles.

It can be concluded that, despite the fact that it is often referred to in recent documents as the economy of the future, the digital economy is still limited to a certain set of activities using information technology and as such is still not determined by the composition, scope and contribution to global trends. Literature analysis also identified key features of the digital economy such as knowledge, globalization, digital business models, the speed of change, supporting infrastructure, integration of independently developed technologies and the use of digital platforms, inequality of development by country, the need for education and the duality of economy – simultaneous existence of "old" and new "digital" economies.

Based on the discussion, certain questions arise that future research should address:

1. What does the digital economy encompass?
2. How is the size of the digital economy measured?
3. How is the impact of the digital economy on the economy measured?
4. What is the supreme body where the answers to the above questions will be agreed upon?

It has been proven that different authors understand the concept of the digital economy differently. This confirms hypothesis 2 that there is still no consensus on the question as to what the digital economy is and what its scope and area are. Therefore, it is extremely important that future research answers these questions as soon as possible in order to uniquely define, develop and measure the digital economy as a clearly defined field that is justifiably considered the basis of future economic trends. Al-

though a large number of definitions of the digital economy are present in the literature, very few documents attempt to define the boundaries of the digital economy as well as the mode of measurement. Will we consider and measure the digital economy only as the benefit that digital technologies create to the traditional economy? Will we consider the digital economy as products and services that are created exclusively through the application of digital technologies, or will we attribute the complete value of these products and services to the digital economy, regardless of the fact that only one part depends on digital technologies? The lack of measurement of the digital economy could be explained by the fact that the digital economy is an integral part of the global economy. It is still developing through the rapid development of digital technologies that become either part of "old technology" or independent technology that creates products and services. With the further development of digital technology and further taking over of the functions of "old" technology, the digital economy will grow to the point where it will be possible to establish a clear boundary between products and services created by the application of old or new technology.

At this point, arguments can be found that explain the attitudes of both "parties" - why a product and/or service could be considered and measured as part of the digital or the traditional economy.

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Professional paper

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New product development: From idea to market launch – evidence from Kosovo banking sector

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NEW PRODUCT DEVELOPMENT: FROM IDEA TO MARKET LAUNCH – EVIDENCE FROM KOSOVO BANKING SECTOR

Abstract

Purpose: New products are vital to the success of firms and represent opportunities for business growth and development. The transition from the idea to the launch of a new product represents a process as complex as it is interesting for a firm. This is especially true for banking products. The purpose of this paper is to analyze how much a bank strategy influences the development of new banking products and whether customer preferences have an impact on the launch of new products by commercial banks.

Methodology: Regression model, correlation, KMO and Bartlett's test will be used to analyze the impact of independent variables on the launch of new products on the market.

Results: The results of this research show that the strategy of Kosovo commercial banks influences the creation and development of new products.

Conclusion: Therefore, it can be said that commercial banks do not lack strategies which have the launch and creation of new products as their element. Banks also take into account customer and society requirements regarding the development of new products.

Keywords: New product development, business, marketing, technology, bank

1. Introduction

Most firms in all sectors constantly strive to develop innovations with the aim of developing new products and perfecting existing ones. Although it is a difficult and risky process, new product development has the potential to bring huge benefits to the company, such as gaining market share, improving sales of existing products, retaining customers and providing services that the company must provide to increase funding and keep its doors open. This is especially important for sectors such as banking, pharmaceuticals, and medicine. Companies consider that close to half of all sales come from new products commercialized in the last three years; then it will be necessarily understood that the development of another winning product or service cannot be left to chance (Goldsmith, 2012; Jusufi et al., 2020).

Only a few decades ago the focus was totally on the development of tangible products, but nowadays it is about the development of ideas, plans, strategies and the creation of solutions instead. At the same time, there is a growing emphasis on the contribution of products and services to the realization of global sustainability. This means that new prod-

ucts should not be "new and improved", but "new to improve" the society in which they function (Joore, 2010). New products are central to the success of a modern company. For example, in 1986, it was estimated that 40% of manufacturers' sales in the U.S. came from products that firms did not have five years before. Further, a study of senior executives reveals that, by an eight-to-one majority, they believed their firms would be more dependent on new products in the future. A Coopers and Lybrand survey reported that most companies are counting heavily on new product development for growth and profitability in the years ahead (Cooper & Kleinschmidt, 2011).

Developing and launching a new product on the market requires not only great effort but also sophisticated tools and methods to reach the customer or client. New product development is among the key achievements for companies and an excellent opportunity to gain market share in return. Simply, not only an idea is enough to come up with a new product but also sophisticated plans and methods that enable the success of the product in question. The stages from the initial idea to the final process (i.e. a product launch) are almost the same in different business operations. The stages of new product development need to be followed wisely because the process can make the difference between new product success and failure.

When company develops a new product or service, there is a process that is common to this development, and it can help ensure that you make the best product or service for your target audience. The challenge, however, is that some entrepreneurs or companies are tempted to skip one of these steps, hoping that this would shorten the process, but that usually ends up short-changing the quality of the product or service they are developing. Understanding the necessity of each phase of new product development can give the confidence to stick with it, even during the most frustrating moments (Quain, 2019, p.12).

The research goals of the paper are as follows:

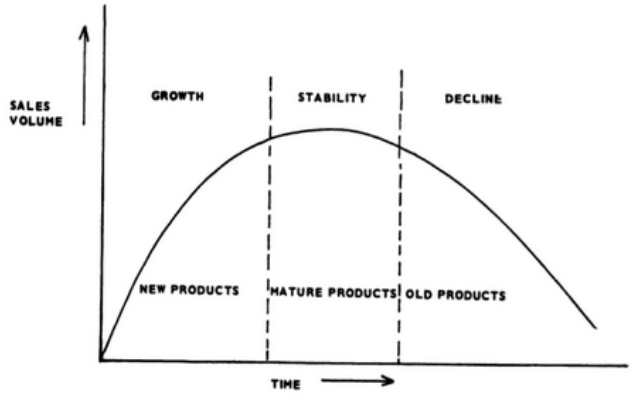
1) Review the literature on new product development, marketing and a new product development strategy, social media and new product development, and the impact of technology on new product development;
2) Analyze the impact of a banking strategy on the development of new banking products;
3) Analyze the impact of customer preferences on new product development.

2. Theoretical and conceptual framework

2.1 New product development processes

According to James and Woelfel (2000), new products represent business opportunities for the future, just as existing firm products represent business opportunities for the current or past period. The product life cycle in Figure 1 describes a phenomenon that most products go through - from birth, through an initial growth stage of a new product, then a relatively stable maturity stage, and finally, to the declining stages related to old age leading to eventual death. Creating and launching new products is a high-risk process, but despite this, there is an essential need to create new products so that the company is in step with current developments and future processes.

Figure 1 The product life cycle



Source: James & Woelfel (2000)

Whenever the decision is made to develop and launch new products, this decision can be seen as the tip of the iceberg in terms of the company's long journey in a harsh and highly competitive global market environment. Regardless of their size, companies are aware that the frequency of market failure after the launch of new products is really high. Clancy et al. (2006) share their experiences saying that with both consumer services and business products and business services the failure rate of new products is at least 90%. They also add that no more than 10% of all new products or services are successful. So even after 3 years their success is very limited.

This is true for product categories such as medical, pharmaceutical, consumer, financial services, etc. Marketing executives know that companies need to maintain a steady flow of new product growth or keep pace with competitors. Technological advances, changing consumer tastes and competition all mean that companies must continue to innovate to avoid being hit by the wheels of change. Loch and Kavadias (2008) and Jusufi and Ramaj (2020) claim that new product development in a common context encompasses a large number of topics and challenges in a company such as strategy formulation, deployment, resource allocation, and coordinated collaboration among people of different professions and nationalities, as well as systematic planning, monitoring and control. New product development has been an important topic for several business research disciplines, certainly economics, marketing, organizational theory, operations management and strategy.

In order to be successful as new products mature, companies need to develop new strategies and working methods. But according to Claessens (2015), out of thousands of products entering the process, only a small portion reach the market. Therefore, it is essential to understand consumers, markets and competitors in order to develop products that offer superior value to customers. In other words, the consumer should not be overlooked, who is the reference point for new products both in the field of business and in the field of medicine and pharmacy.

An idea is conceived and qualified in terms of the opportunity and overall business sense. There are costs associated with these activities, such as market planning cost, surveys, customer visits, and demographics data analysis. There are also opportunity costs and costs referring to market data feedback and their coalescence into a product opportunity. The scope of the target market is accounted for in this stage and the product platform must be laid out to enable the product to reach the market as cost-effective (Annacchino, 2007; Qorraj & Jusufi, 2019, p. 23). Major steps commonly used in the new product development processes are: *the idea generation phase*, *idea screening*, *the research phase*, *the concept development phase, the concept testing phase, marketing strategy development, commercialization or the release phase.*

Idea generation is the first phase of new product development. It refers to a systematic search for new product ideas. The idea generation phase helps a company go through a number of different iterations of a product or service to determine which one has the unique characteristics that will make it stand out in the industry in which the company competes (Quain, 2019). Typically, a company generates hundreds of ideas, maybe even thousands, to find a handful of good ones in the end. Two sources of new ideas can be identified:

- Internal idea sources: the company finds new ideas internally. This implies R&D, but also contributions from employees.
- External idea sources: the company finds new ideas externally. This refers to all kinds of external sources, e.g. distributors and suppliers, but also competitors. The most important external source are customers, because the new product development process should focus on creating customer value (Claessens, 2015).

It is important to remember that a product or service must be something that can improve the image of a company, enhance its sales and revenues, and upgrade to account for changes in the wants and needs of the target audience (Quain, 2019; Beqaj et al., 2019).

Idea screening is a process of filtering the ideas to pick out good ones suitable for the overall company objectives. All ideas generated are screened to spot good ones and drop poor ones as soon as possible. While the purpose of idea generation was to create a large number of ideas, the purpose of the succeeding stages is to narrow and reduce the number of ideas. The reason is that product development costs rise greatly in later stages. Therefore, the company would like to go ahead only with those product ideas that will turn into profitable products (Claessens, 2015).

The *research phase* should in a way be the first one because it is the step in which companies research their market and determine whether the idea will appeal to the target audience - costumers or clients. Some of the questions a company needs to ask include the following:

a. Which problem will the product solve?
b. What want or need will the product satisfy?
c. Does the product satisfy the need that competitors do not meet?

The research phase can also provide the qualities and characteristics that the audience/target wants to see in your product or service (Quain, 2019; Rrustemi et al., 2020).

The *concept development* phase takes a product concept into consideration and creates intellectual property required to develop a concept and reduce the costs of material and manufacturing processes for service provider companies or banks. Technical, labor, development, tool, appliances, and other capital equipment costs are included in this phase (Annacchino, 2007). Quain (2019) states that development is the phase in which a company begins to build a product or service. It may sometimes be a frustrating process as a company will most likely go through a few prototypes before landing the one that is the most viable. In some cases, it may learn that a competitor has already launched the same product or service, which will require the company to make last-minute changes which make it spend more than previously planned. According to Claessens (2015), the marketer's task is to develop this new product into alternative product concepts. Then, the company can find out how attractive each concept is to customers and choose the best one. As given above, these concepts need to be quite precise in order to be meaningful. Each concept is tested in the sub-stages.

The *concept testing phase* is the next phase in the new product development process when attractive ideas must be developed into a product concept. A product concept is a detailed version of the new product idea stated in meaningful consumer terms. A company should distinguish between:

- a product idea, i.e. an idea for a possible product,
- a product concept, i.e. a detailed version of the idea stated in meaningful consumer terms, and
- a product image, i.e. the way consumers perceive an actual or potential product (Claessens, 2015).

The best way for a company to find out if a product or service is attractive to the market is to test it. At this stage of testing, it is necessary to select a focus group in the selected target audience, and then use this target group to test the new product or service. After initial testing, the company analyzes important factors such as ease of use, product or service traction and operation, as well as whether the target customers will purchase a new product or service (Quain, 2019).

In the *marketing strategy development* phase, the product and its proposed marketing program are tested in realistic market settings. Therefore, test marketing gives the market experience with product marketing before going into huge costs of full presentation. In fact, it allows the company to test the product and its entire marketing program, including a targeting and positioning strategy, advertising, distribution, and packaging before starting to fully invest in the product. The amount of marketing needed varies with each new product. A lot of test marketing can be performed especially when a new product is introduced that requires a huge investment, when the risks are high, or when the firm is unsure about its product or marketing program (Claessens, 2015).

The *commercialization or release phase* - After all months or years spent developing an idea, it is the right time to introduce the product or service to the market. The launch of the product is essential to its long-term success. The biggest mistake companies make is that they do not continue to market their product or service after it has been launched (Quain, 2019). Commercialization means nothing else than introducing a new product into the market. Large amounts may be spent on advertising, sales promotion and other marketing efforts in the first year (Claessens, 2015). Without a strong marketing strategy, the product life cycle curve will be short (Quain, 2019). Important factors such as timing and place should be considered before the product is launched or commercialized in the market.

Introduction timing has to do with the fact that in the period of a decline in economic activity, it would be wise to wait until next year to launch the product. However, if competitors are willing to introduce their products, the company should demand that the new product be introduced sooner. ***Introduction place*** has to do with where a new product should be launched and whether it should be released in a single country, a region, the national

market or the international market. Normally, companies do not have the confidence, capital and capacity to launch new products into full national or international distribution from the outset. Instead, they usually develop a market plan over time. Very few products actually have a chance to become a success, so in all of these steps of the new product development process, the most important focus is placed on creating superior customer value. Only then can the product become a success in the market. The risks and costs are simply too high to allow every product to go through every stage of the new product development process (Claessens, 2015).

Finally, according to Annacchino (2007), the product is in the customer. The company can start enjoying profits. These gains come when commercialization is done properly at the right time and the right place. In addition, funds should also be channeled back to product planning and market planning to allow for the necessary costs to verify product viability, market program viability, and future improvements and products that make the company strong and competitive in the market.

2.2 Marketing and strategies for new products

Marketing is extremely important for any product, therefore, given that new products need special initial support in the early stages after being placed on the market, this means that without a proper and appropriate marketing strategy, the product can hardly enter the market or even survive (Rrustemi et al., 2021). Nowadays, marketing channels are many, so companies can easily reach their target not only in the local or state-operated market, but it is very possible to reach customers globally through these channels. Advances in technology, more precisely the Internet, are connecting the world and its market like never before. This makes it easy for many businesses to cross borders and sell their products, widely in the market without being physically there, so with a good marketing plan and strategy, companies increase their chances for a prosperous future.

According to the American Marketing Association (AMA) Board of Directors, marketing is the activity, set of institutions, and processes for creating, communicating, delivering, and exchanging offerings that have value for customers, clients, partners, and society at large. When done brilliantly, marketing is driven by a small, disciplined subgroup, and is immersed in a culture (Cohen, 2011). Marketing strategies have a substantial impact on new product development. A business strategy has always relied heavily on marketing ideas, but in recent years the influence of marketing on strategy has grown greatly. Today, more than ever, strategy is dominated by ideas that sink their roots deeply into the discipline of marketing. Customer satisfaction, the idea of getting close to customers, creating a customer-driven company, the profit impact of new product introductions, and explosion of product variety are among the ideas that now dominate strategic thinking. They supplement market share, market growth, and myriad other ideas that have previously been mainstays in strategy.

Marketing bywords such as "customer," "product," and "market" reverberate loudly throughout the study of strategy. Knowing your business, your customers, your markets, and your products are essential ingredients for strategic success (Schnaars, 1998). Commonly, marketing strategies are broad and can differ in terms of the field and market products they refer to. Therefore, strategies can be narrowed down to fit the products and the market targeted by the producers or companies. According to Moschis (1994), the strategic marketing management process includes analysis of business growth opportunities, market segmentation and targeting (positioning), and the development of a marketing program.

Growth opportunities

Intensive growth opportunities refer to opportunities attractive to companies that have not fully exploited opportunities associated with their current products and markets. They include market penetration, market development, and product development. Integrative growth is desirable for firms in industries that have growth potential and in situations where a company can increase its profitability, control, or overall efficiency by integrating with other companies at the same or different levels of distribution in the same industry. A company may seek backward, forward, or horizontal integration.

Market segmentation

Market segmentation involves breaking down the entire market into smaller submarkets or subgroups that can be reached more effectively with different marketing programs. The question of market segmentation is a managerial one, i.e. should the market be segmented? The answer to this question relies on the managers since they are the ones who can examine and scrutinize the benefits of market segmentation vis-à-vis its costs. Market targeting distinguishes among many market segments, selects one or more of these segments and develops products in marketing mixes tailored to each segment.

Developing marketing programs

After choosing a target market or markets, marketing programs or plans for action must be designed to reach these markets. This process involves tactical strategic decisions on specific marketing activities, including decisions on the levels of marketing expenditures and dozens of elements of the marketing mix such are pricing, distribution and promotion decisions. Pricing strategies include decisions on whether the product should be priced at competitive levels, a skimming strategy should be used where high introductory prices are set, or the company should use penetration pricing, where the company sets a relatively low price in an effort to quickly penetrate the market. Distribution strategies deal with decisions on the types and numbers of distribution outlets that should provide incentives to distributors to promote the product ("push" strategy) or to create consumer demand ("pull" strategy). Promotion decisions vary with respect to the types of promotion that should be used (i.e. advertising and sales promotions) as well decisions on specific promotional strategies such as media and message strategies.

2.3 Social media and new product development

Yip and Blaclard (2019) emphasize that in today's fast-paced life, the majority of people rely heavily on the electronic devices such are smart phones, tablets, laptops and the like. In addition to the opportunity to be in touch with everyone and to be informed in real time, every owner of those intelligent electronic devices is the target market of many companies in the world. Since those devices have become an individual mobile virtual "market place" and a liaison tool between sellers and buyers, they are simply used as potential buyers by almost any company that intends to inform about and sell their products and services. This trend is used by companies as an easy gateway to reach customers and clients through social media and to inform, educate, sell and in some cases also seek help regarding new product ideas.

According to Smith (2016), social media is so beneficial to new product development that a company has achieved success in product development through customer feedback on social media. Every day, billions of people talk on social media about where they have been, what they have bought, and express their feelings and opinion about products and services. This information is a gold mine for the industries facing consumers, including retail, consumer goods, banks, insurance, the pharmaceutical industry and healthcare. But few companies have developed plans and strategies regarding these valuable data. Social media is changing the way consumer product companies develop, market and package their products. Consumers and companies are beginning to discover a range of opportunities offered by social media. This new approach, driven by social platforms, is increasingly informing about new product development, marketing, operations, and the international expansion of consumer product companies.

Bazhanov (2017) claims that Parmalat Canada Inc. is an example of how this corporation used social media to help consumers with the idea of a new product. Social media and various online customer search forms are playing an increasingly important role in identifying new trends and generating product ideas for Parmalat Canada Inc. One example of using social media to generate new product ideas is the "New Ideas" portal that has recently been added to the company Intranet. Employees have been very enthusiastic about delivering their new product ideas, as well as reviewing and voting the best ideas online. The most popular ideas are then further investigated by the respective marketing teams and presented to the Innovation Committee. The program is supported by the Human Resources Department, which helps to administer the contributions of the participants and advance them to the presentation phase.

Many advertisements are offered and broadcast online in an effort to inform customers and clients firsthand about new products and services, news, changes and other attractive activities of the company. Today, almost every company, including banks, various corporations, small and medium businesses, utility companies, public companies, insurance, healthcare companies, pharmaceutical companies and an infinite number of other businesses, has its official website on various social media such as Facebook, Twitter, LinkedIn, Pinterest, YouTube, Tumblr, Skype, Google+, Flickr and Instagram. Undoubtedly, social media serves as a platform not only to inform existing virtual communities, but also to attract and engage potential buyers in free marketing with various campaigns aiming at profitable productivity while generating higher revenue.

2.4 Technology impact on new product development: Focus on the banking system in Kosovo

Technology innovation has assumed considerable importance in the contemporary business world. In most industries, the very survival of firms is increasingly dependent on their ability to rapidly develop and introduce innovative products and services (Cooper, 2001; Schilling & Hill, 1998). Throughout modern history, technology has progressed through many business cycles and profoundly impacted economic activities. Business information technology (IT) and the Internet are linchpins of contemporary high technology that provided the opportunities and enabled new products to be created, developed and commercialized. High technology (IT, electronics and biotechnology) has changed markets, products, services and marketing systems. The pace of technology development and application has "globalized" communication, commercialization and changed the industrial infrastructure through software applications such as enterprise resource planning (ERP). It has created new industrial products and Internet services that have replaced traditional banking services, e.g. ATMs and online capability (Rafinejad, 2007).

Kosovo has experienced an immense revolution in the banking sector since 2000. The banking sector has played a vital role in Kosovo's economy serving businesses and individuals with present-day products and services. In addition to its proven efficient functioning, over a relatively short period of time, the banking industry in Kosovo was able to implement international standardization frameworks, modernize banking services, and deliver highly attractive and innovative products, by creating new opportunities for improvement in the overall business environment in the country and boosting competition (Lumezi, 2019). Just like its counterparts in the developed countries, Kosovo's banking sector is adjusting to the increasingly dynamic nature of information technology leading to innovation in the field of digital financial services (Mehmeti, 2019). Banks are pushed to transform by leaving the typical traditional model and gradually transitioning to a model that provides advanced electronic technology based products and services (Gashi, 2019).

With the support of technology, banks in Kosovo have improved and aligned their services via advanced and viable secure products through which they gained business and customer trust. Increased reliability of banks caused companies and individuals to increase their use of almost every new banking product. The latest technology advancements have made many customers shift from PCs to smartphones to enjoy financial services provided by banks. Laptops, smartphones and tablets are new tools used by customers for banking services because they want to obtain a faster and more efficient response in daily communication. That is why self-service digital channels are an important gateway to stimulate customers to engage more in the use of digital services and obtain banking products faster and safer (Batalli, 2015, p. 23). It is worth mentioning that new products that have recently been launched by banks in Kosovo are almost state-of-the-art products that could be found at most prominent banks in the world, e.g. Private Business Bank (originally BPB) is the first bank in Kosovo that launched contactless cash withdrawal technology, a fully digital, secure and fast option of withdrawal (BPB, 2020). NLB Bank LLC Prishtina introduced the newest product in the Kosovo banking market, the NLB Pay mobile wallet - a digital wallet mobile payment application, which supports all MasterCard brand cards (NLB Bank, 2019), to name but a few.

This unique product in the Kosovan market allows NLB Bank clients to execute their payments at POS terminals at home and abroad through a mobile phone application, which replaces the use of physical cards. ProCredit Bank Kosovo has recently launched a new product called a contactless sticker (ProCredit Bank, 2019). It is a debit MasterCard sticker that allows customers to make contactless payments at each and every POS terminal everywhere in the world where MasterCard logos are exposed along with a contactless payment sign. Raiffeisen Bank Kosovo has also launched a new product called STICK 'N' PAY (Raiffeisen Bank Kosovo, 2019). It is a sticker card on a cell phone or any other piece of equipment. Clients can pay at all merchants equipped with a POS terminal that accepts contactless card payments or whenever you see a contactless payment sign. A sticker card and POS terminals use an advanced technology protected with a chip. All codes are unique for each transaction. Moreover, the bank offers to its clients the same security levels as those applicable to regular cards.

According to Bibolli (2015), the banking sector in Kosovo has been dedicated to enhancing the quality of services for clients, and has intensified investments in banking technology. Through the

adoption of new technologies, commercial banks in Kosovo have enabled access to businesses and customers in the global financial markets and have aligned Kosovo's economy with the global economy. So far, we have witnessed a swift response to technology innovation and conversion into suitable contemporary products and services from operating commercial banks in Kosovo. The pace of technology advances will surely be likely to continue in the future with enduring enhancement of innovative products; meanwhile, a global competitive race to expand into a new market is going to lure many international banks into regional markets which Kosovo is part of, with attractive, creative, premium and competitive product inventions. We are convinced that the operation of the banking system will continue to be bonded with up-to-date technology advances, shaping in that way jointly a bright future and fulfilling the needs and desires aimed at facilitating business activities and the daily life of citizens. Modern and cutting-edge technology adopted and applied by banks in Kosovo mark them valuable treasury anchors that foster economic growth and overall sustainability for the future of our country.

3. Methodology

Our sample consists of 100 respondents, who were interviewed by the authors of the paper related to the banking products offered by commercial banks in the period January 2021 - March 2021. These respondents come from the capital of Kosovo, Prishtina, and from the third largest city of Kosovo, Gjilan. The research questions are as follows:

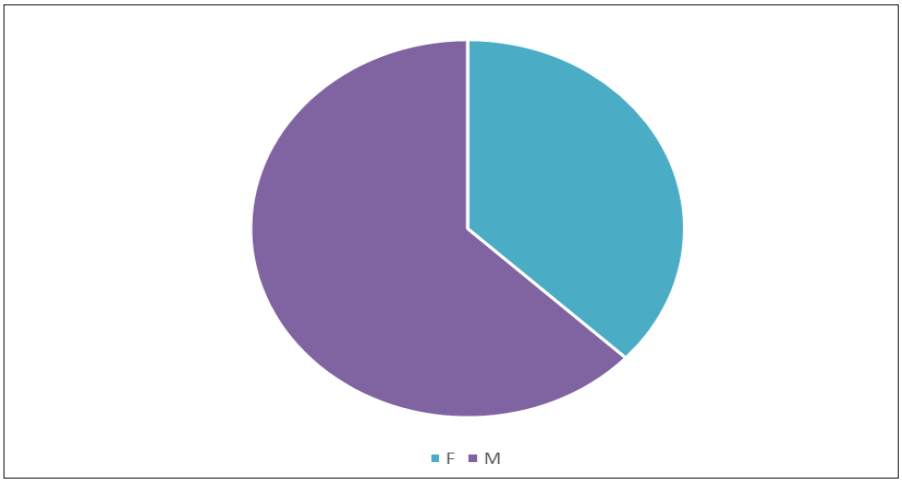
- *How much has the strategy influenced the development of new banking products?*
- *Do customer preferences have an impact on the launch of new products?*

The results achieved by these respondents will be processed in the SPSS software package. The regression model and correlation will be used for data analysis. New banking products are our dependent variable, while the independent variables are the information system, a creative idea, innovation, the efficiency strategy, and customer preferences. All of these have an impact on the launch of new products.

4. Results

Initially, descriptive statistics, which provide information about the gender, age and place of residence of respondents, will be presented in this section. As already mentioned, these respondents come from the cities of Prishtina and Gjilan as well as from the surroundings of these cities. The first figure shows that there are 37% female and 63% are male respondents.

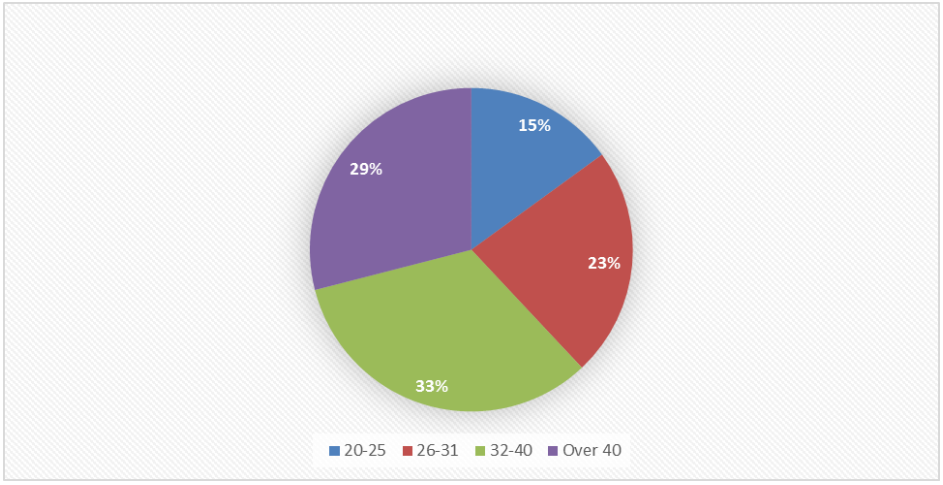
Figure 1 Respondents by gender



Source: Authors' own calculation

Figure 2 shows the distribution of respondents by the following age groups: ages 20 to 25 years (15%), 26 to 31 (23%), 32 to 40 (33%) and over 40 years of age (29%).

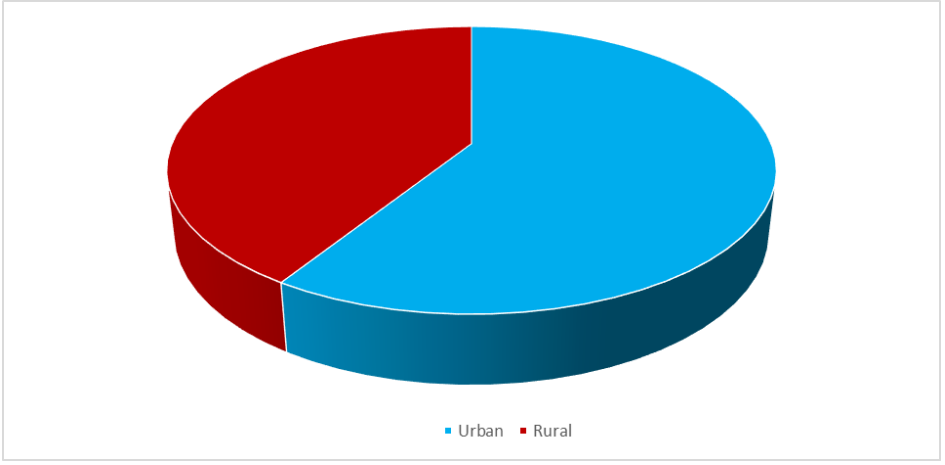
Figure 2 Respondents by age



Source: Authors' own calculation

Figure 3 shows the distribution of respondents by the area the respondents come from (i.e. 41% and 59% of respondents come from the rural and the urban area, respectively).

Figure 3 Areas respondents come from



Source: Authors' own calculation

The dependent variable which represents the level of development of new products is a categorical variable. Respondents were asked whether the bank, whose clients they are, has developed any new products. After that, they were asked if their bank has a sophisticated information system, i.e. how much banks inform these respondents as their clients about innovations. Respondents were also asked if their bank is creative and innovative, if their bank officials have ever talked to them about their prefer-

ences and eventually taken into account their preferences for developing new banking products. The strategy of a commercial bank plays an important role in the development of banking products, so respondents were asked if they think that their bank really has an effective strategy. Coefficients of the regression model will be presented in the table below.

Table 1 Coefficients of new banking products

Coefficients					
Model	**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	.705	.041		19.957	.000
Information system	.142	.056	.116	4.738	.023
Creative idea	.023	.065	.059	4.354	.025
Innovation	.101	.064	.203	5.583	.001
Efficiency strategy	.342	.073	1.688	6.205	.000
Customer preference	.530	.054	.775	8.803	.000
a. Dependent Variable: New banking products					

Source: Authors' own calculation

Table 1 shows coefficients and their significance for the new banking products, with the analyses done for the banking market in Kosovo. The table shows that independent variables consist of the information system, a creative idea, innovation, an efficiency strategy, and customer preferences, which all together have an impact on the dependent variable (i.e. new banking products).

Based on the research question *How much has the strategy influenced the development of new banking products?*, we came to the conclusion that *the strategy influenced the development of new banking products.* Independent variables are significant, therefore according to customers or clients of commercial banks, the strategy has an extraordinary impact on the launch and development of new banking products in Kosovo. In addition to regression, correlation analysis was used in this paper.

Table 2 Correlations estimation

Correlations			
		New banking products	**Customer preference**
New banking products	Pearson Correlation	1	.984**
	Sig. (2-tailed)		.000
	N	100	100
Customer preference	Pearson Correlation	.984**	1
	Sig. (2-tailed)	.000	
	N	100	100
** Correlation is significant at the 0.01 level (2-tailed).			

Source: Authors' own calculation

Correlation is a mutual connection between two or more variables that affect each other. The results in Table 2 show that the correlation coefficient between new banking products and customer preference (0.984) is positive and that there is a significant correlation at the level of significance 0.05 (0.000).

As to the research question*: Do customer preferences have an impact on the launch of new products?*, it can be concluded that the preferences of banking customers have an impact on the development of new products.

Table 3 Reliability Statistics

Cronbach's alpha	Number of items
0.821	100

Source: Authors' own calculation

The Cronbach's alpha value of 0.821 shows that our model is a high reliability model. It also explains quite well the researched problems.

Table 4 KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy		.938
Bartlett's test of sphericity	chi-square approx.	254.955
	Df	67
	Sig.	.000

Source: Authors' own calculation

Bartlett's test can be seen in Table 4. It shows that the data given above are 93.8% suitable for analysis and the significance level is 0.000. This shows that our data, i.e. our model, have the value and are important for considering certain issues.

5. Discussion and conclusions

Banks in Kosovo need to create a cross-structural communication plan consisting of up-to-date and accurate information about customer preferences, and at the same time they must develop modern innovative techniques in terms of launching contemporary banking products. In addition, these banks need to develop global thinking approaches to pursuing strategies for launching new products driven by technology, globalization, trade liberalization and homogeneity of customer demands. Based on the literature review and empirical evidence, the following recommendations can be made:

- Banks in Kosovo should be oriented towards the development of the information system.
- Banks in Kosovo should develop creative and innovative ideas.
- Commercial banks should create a strategy compatible with customer preferences.
- Banks in Kosovo should be oriented towards new products as competitive advantages in the market.
- Banks in Kosovo should create an efficient strategy oriented towards digital marketing as a promotional instrument of new products.

Our research results show that a strategy influences the creation of new products. Therefore, it can be said that commercial banks do not lack strategies which have the launch and creation of new products as their element. Despite this, banks in Kosovo must make use of the experiences of various banks in North Macedonia, Croatia, Slovenia, and Greece, which have gone through different stages of new product development. 90% of Kosovo commercial banks are banks with foreign capital. Therefore, these banks should not find it difficult to obtain information and experience from the banks in the countries of the Western Balkans region. Evidence confirms that consumer preferences in the banking market have an impact on the creation and launch of new products. Based on this evidence, it can be said that consumers are satisfied with banking products in Kosovo.

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Book review

Predrag Bejaković:
Book review "The future of pension plans in the EU internal market"

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BOOK REVIEW "THE FUTURE OF PENSION PLANS IN THE EU INTERNAL MARKET"

Editors: da Costa Cabral, N. & Cunha Rodrigues, N.

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Pension systems in many countries face serious problems regarding financial sustainability of the pension insurance scheme and adequate protection of old-age citizens. A new book edited by Costa Cabral and Cunha Rodrigues titled *The Future of Pension Plans in the EU Internal Market* gives a new view on the possible solutions how to ameliorate an unfavourable situation. The book is divided into the following three main parts: Section 1 - Pay-as-you-go versus funded pension plans: Which way to better address common challenges in the EU?, Section 2 - The Capital Markets Union (CMU) and the future of pension plans: opportunities, risks and drawbacks, and Section 3 - Pension plans and the European pillar of social rights: a new scope for EU social policy?. The publication consists of 18 chapters, the authors are mostly university professors from the fields of economics and law, and one of the co-authors is a Nobel Prize winner Robert C. Merton.

In the introduction, the editors explain the aim of the publication and contributions by particular authors. Pension systems around the world should simultaneously go for the development of the inner capital market and the search for new social policy. This is particularly important having in mind the soft nature of social policy in the EU that can provide needed flexibility in response to different trends and the national influences by the EU Member States on the pension insurance schemes.

The first section consists of 5 chapters and begins with the contribution of Miguel Coelho dedicated to the characterization and comparability of old-age pension systems. On p. 32, the author presents an easily comprehensible table with the advantages and disadvantages of various pension models, i.e. (a) funded (capitalised) against unfunded systems (pay-as-you-go - PAYGO), (b) actuarial versus non-actuarial systems, and (c) defined benefit (DB) versus defined contribution (DC) systems, with the aim of better resolving complex challenges in the EU in this regard. He believes that a capitalised (funded) system, with defined contributions and actuarial fairness, has advantages over a public PAYGO system because it enables improved protection from demographic changes, has limited financial liabilities, allows the development and establishment of the capital market and better prevents politicization of the pension system.

Hervé Boulhol and Marius Lüske analyse in their contribution what is new in the discussion about the PAYGO system (how much and where a transfer is from current employees to today's pensioners) versus funded pensions (where current workers save

part of their contributions which are invested in the financial market and then used to finance pensions when people retire). The authors explicate the actuarial similarity between PAYGO and capitalised systems, stressing that the relative benefits and costs of a shift from the former to the latter mostly depend on whether the observed economy is sufficiently dynamically efficient. Boulhol and Lüske underline that this shift creates winners and losers and therefore causes some new arrangement of redistribution. Although under certain circumstances the rate of return on capitalised pensions may be higher than that of PAYGO systems and potentially enable an increase in pensions, the authors believe that funded systems should be implemented only if the change can be sufficiently sustained in the long run.

Yves Stevens analyses the role of government regulation in providing access to funded or unfunded pension systems. He evaluates the models of funded and PAYGO systems not only from the standpoint of risk sharing, but also from the historical and ideological basis of different notions of pension models and their causal meaning and significance. The government is obliged to limit various risks. *This spreading of risks is naturally linked with how a given country sees the different pension forms and the concepts it has historically envisaged and embedded in its national welfare state or social policies* (p. 59). National pension identity schemes reflect an identity that has been moulded historically and ideologically. This is also the reason why pension reforms are more successful when they are parametric instead of fundamental and/or structural changes of the entire pension approach.

Maria Teresa Garcia examines trends in both occupational and personal pension insurance, stressing an important move from defined benefit (DB) to defined contribution (DC) plans. Garcia recognises the main causes of this modification. The shift is a phenomenon spread throughout most of the developed countries, and therefore retirement and financial risks are increasingly being shifted to individuals. The reasons for the aforementioned change can be divided into two categories: changes in the economy (primarily changes in the traits of workers and employers, as well as macroeconomic changes), and regulatory changes that include changes in laws and changes in accounting requirements.

Due to ageing populations, many OECD countries have a seriously negative demographic trend. Fallilou Fall draws attention to the central question of sustainability and adequacy of various pension systems across the OECD members. Intending to improve sustainability, many countries have introduced different policy measures into their pension systems. Most countries increased the legal retirement age, introduced automatic adjustment of key parameters, primarily changes in life expectancy, and/or increased the contribution rate. On average, 12% of the population aged 65 years or over in OECD countries live in poverty, so the adequacy of pensions is already a serious problem. Pension adequacy can be enhanced by better indexation and adjustment of revaluation rules of pensions. However, there is always a need to balance sustainability and adequacy because too high indexation and revaluation rates increase pension spending, while too low indexation of pensions will cause dangerous adequacy problems.

An analysis of the capital markets union and its role in saving for retirement is the introduction chapter in the second part of the book. The authors Ansgar Belke and Philipp Allroggen explain that the capital markets union (CMU) has two main goals: to improve investment prospects across Europe and to improve financing possibilities for businesses. The CMU aims for a more stable and robust financial sector through deeper integration creating a single market for capital by eliminating barriers to cross-border investments and improving access to financing for all businesses around the EU. In this process, special focus is directed towards SMEs and start-ups as well as to the promotion of retail and institutional investments. The authors remind that although the responsibility for retirement has been shifted towards the individual, *policymakers should at least provide better access, stability, capability and information to savers and investors* (p. 113). Europeans save for retirement but only a few of them invest in stocks or bonds, so the CMU could motivate them to invest in the financial market, particularly out of their home country. That can promote more investments and enable stronger economic growth as well as contribute to bigger pensions.

Gabriel Bernardino analyses the growing financial gap between what people deem they will obtain as retirement income and what they will actually receive. The author writes about the role of improved regulation and the importance of supervisory authorities in regaining trust in pension plans and products. Bernardino uses valuable and nice exam-

ples from Behavioural Economics - procrastination or inertia, loss aversion, and a rule of thumb - that help to understand how human behaviour may affect a financial decision and could influence choices regarding private retirement saving. Private pension products and schemes have to be cost-efficient, which can be obtained by achieving economies of scale and providing adequate smart default solutions, where a group of quality standardised features is accompanied by flexible components and innovation in service provision.

In their text under the title *Welfare gains from a capital market union with capital-funded pensions*, Thomas Davoine and Susanne Forstner scrutinise the long-term effects on the pension system of separate and integrated capital markets. The latter, obtained through a capital market union, is more beneficial if other countries in the market union have PAYGO systems. Households in a country that accepted a capitalised pension system would enjoy long-term benefits ranging between 0.3% and 0.5% of lifetime consumption if the country is in a capital market union, compared to separated capital markets. The main cause is that a capital-funded pension system increases national savings since contributions are saved for future consumption, instead of being immediately consumed by pensioners in a country with a PAYGO system. If capital markets are integrated, households can invest part of their savings in other countries that have PAYGO pension systems and benefit from a relatively higher interest rate that is present there.

Due to a rapidly ageing population, Portugal is exposed to serious problems of the pension system, while the pension benefits are low. Such conditions require the introduction of a supplement to social security with private savings. Portugal is also characterised by a low level of financial literacy. Thus, transferring the responsibility of retirement insurance to the general population could cause many future pensioners to retire poor. As a measure for improving the situation, Merton, Muralidhar and Pinto Ferreira propose introducing a new innovative type of a sovereign contingent debt instrument, i.e. Standard-of-Living indexed, Forward starting Income-only Securities – SeLFIES. Such instrument can simplify retirement planning, ensure retirement security, and also improve the government possibilities for debt financing and infrastructure construction funding. Unlike Treasury Inflation-Protected Securities that are focused mostly on inflation, SeLFIES would also include the living standard risk improvements. This model would be optimal for those who judge *their economic well-being on the basis of their standard of living relative to those around them* (p. 170).

One of the main hindrances to the free movement of people and workers in the EU is that pension rights are not portable across the EU borders. Therefore, Nuno Cunha Rodrigues studies the role of the pan-European pension product (PEPP) and the capital markets union (CMU) as measures to overcome this obstacle. The most important aim of the PEPP is to boost cross-border mobility by providing a simpler pension product for people who have worked or intend to work in various EU Member States. Several measures have already been taken towards stronger coordination of national economic and monetary policies aimed at mitigating the impact of factors that hinder mobility. Attention has been directed towards structural reforms that can improve the functioning of the internal market, particularly regarding the freedom of capital movement. The PEPP has already been approved, while there is also a need to make legislative proposals for an EU framework on covered bonds and securities to increase legal certainty on securities ownership in the cross-border context.

Although the PEPP should help to enhance the functioning of the internal market, improve labour mobility within the EU, strengthen trust in the EU institutions among EU citizens and ensure liquidity of long-term investments, Karel Lannoo is not fully convinced of its final success. The reason is that the blurred, unappealing and inappropriate text agreed between the European Parliament (EP) and the EU Council would not be useful in practice. Due to heavy pressure from the Member States and certain organisations, the text was fragmented, watered down or replaced, so the final version of the PEPP was disappointing. The final form of the text has become applicable only to individual voluntary pension savings in the third pillar, not for any type of professional (occupational) pension insurance. While the PEPP was originally designed as an insurance or savings product, it has become only an insurance product and therefore it has lost its initial intent in significant part. The author concludes that the PEPP *as adopted leaves the impression that it is impossible to construct a truly EU-wide long-term savings product* (p. 196).

Publicized as an instrument to boost the portability of pension rights, the PEPP did not solve the problems related to the deepening financialisation within the EU and adverse consequences for pension regimes linked thereto. In his contribution, José Castro Caldas explains the most important aspects of financialised capitalism: (i) an increasing activity of non-financial enterprises in financial processes, (ii) the shift of bank activities from borrowing and lending to transactions and profit in open financial markets, and (iii) increased reliance of citizens on the formal financial system to improve access to vital goods and services. In 2014, the European Commission wanted to establish a Capital Markets Union (CMU) to improve economic growth and enhance the Eurozone's resilience. However, due to various factors (primarily because of a complex, non-transparent and non-standardised decision-making process), the aforementioned measures did not achieve the desired results and the EU is still actively searching for an optimal model for reviving the role of financial markets in the EU, the development of the CMU and the implementation of the PEPP as its important instrument.

Five contributions presented in the last section of the book are dedicated to a new opportunity for EU social policy. Nazaré da Costa Cabral underlines that optimal development of pension systems should choose between respecting social rights more or becoming more oriented towards financial markets. There is increasing tension between social rights and financial markets that may eventually lead to the prevalence of one over the other. There are two hypothetical alternatives for the future proposal of pension systems, i.e. the individual insurance model and the universal tax-financed model. Although caused by common factors, primarily an ageing society and widespread and fast technological changes, the responses and incentives are substantially or philosophically different. Both PAYGO and capitalised systems face multiple risks, which is almost impossible to predict. These are primarily economic, demographic and political risks, but also various additional risks, like management risks (related to incompetence or fraud and/or imperfectly informed consumers in funded systems), investment risk, longevity risk and annuity market risk. The situation is particularly dire having in mind the new forms of work, like insecure or temporary jobs, which would seriously reduce tax and contribution revenues and cause additional problems for pension system funding. Therefore, the author reminds of the demanding challenge *to find new sources of justification and legitimacy for the role of the markets in pension provision* (p. 243).

The idea of the European social model has been quite often publicly discussed, but with several political meanings. The constantly changing European social policy is a theme of interest for Pedro Adão e Silva and Patrícia Cadeiras. The authors offer an interesting historical overview of social policy in the EU, from the original treaties to the present circumstances. After more than a half-century after integration, the main parts of social policies are still under the control of nation-states. Such national policies are characterised by a variety of institutional organisations and different political principles. Therefore, it should not come as a surprise that European social policy has had the 'Cinderella' status for a longer period, where good purposes and great principles were followed with little action. However, the soft nature of such policy may prove to be a major asset to ensure the required flexibility in response to the differentiated national impacts of the most important trends in European societies, from demography changes to the new form and future of work.

Spasova, Louvaris Fasois and Vanhercke discuss the main trends of pension reforms in the EU Member States (MS) in the period 2014-2019, dealing with the question of pension adequacy. As adequacy and sustainability in pension systems are closely intertwined, the authors analyse reforms related to prolonging working life, measures for the protection of pension adequacy, and actions for preserving retirement income. Even though pension insurance systems mostly remain within national competence, one should not neglect the impact of various proposals by the World Bank and the International Monetary Fund. In the last 20 years, the EU has also become an important factor that contributes to pension policy mostly through the Open Method of Coordination and the European Semester. Pension policies in the EU Member States have passed through great socio-economic transformations in an attempt to improve pension benefit adequacy and protect financial sustainability of pension expenditures to achieve fiscal stabilisation of national budgets.

Josef Wöss and Erik Türk contest a conservative view on the sustainability of pension systems, believing that the best solution for pension adequacy

and financial sustainability is an increase in employment rates. They remind how the old-age dependency ratio, i.e. the number of older persons to the number of the working-age population, is quite often misrepresented as the ratio of the number of workers to the number of pensioners. As a positive example, Wöss and Türk present the 'dependency ratio calculator' developed by the Austrian Chamber of Labour. The instrument uses graphs of the age structure and economic status of the population to calculate demographic and economic dependency ratios. Successful integration into the labour market of all working-age persons would significantly improve the future economic dependency ratios and therefore improve pension adequacy and financial sustainability. Mobilising the full employment potential in all age groups and enhanced labour market integration of vulnerable groups such as women, the immigrant population and the elderly could contribute to the achievement of adequate pensions and lessen the problem of financial sustainability of a pension system.

Ivana Vukorepa, Yves Joren and Grega Strban clarify how ageing societies and society fluidity can impact pension schemes and coordination rules at the EU level in terms of both pillars of pension insurance. Fluidity in this context means new patterns of (organising) work and mobility, or in other words, non-standard or unstable forms of employment (like temporary agency work, fixed-term contracts, part-time work, telework, traineeships and student work), which are often not adequately covered by pension insurance. The authors direct their attention to the following three mutually related aspects: (a) changes required in pension insurance schemes because of new working arrangements, (b) the relevance of EU legislation regarding free movement and social security coordination in relation to public and occupational pension insurance, and (c) the importance of persistent and efficient measures for combating fraud and error.

It is almost impossible to sum up all the praiseworthy messages from this excellent book. Briefly, there are no perfect pension systems and the reform process should consider the context in which the respective reforms are being realised. Depending on the setting, accepting a particular approach may have different outcomes. The economic crisis that started in 2007 had a strong impact on the process of reforming pension systems in Europe leading to a reduction in social protection levels of public systems. The goal of adopted measures and numerous reforms was to lower public expenditure. To address such complex and demanding challenges, a number of policy ideas have been developed and various proposals prepared. First and foremost, there is an obvious need to design transparent, well-governed and cost-efficient pension products and schemes. To obtain consumer trust and allow consumers to make informed decisions there is a need for transparency in relation to characteristics, cost and charges as well as sustainability of the private pension solution and its provider. The EU had an influential role in this field, insisting on the promotion of complementary private retirement savings to ensure satisfactory income for the elderly population.

To optimise future retirement benefits, the authors in the book emphasise that pension assets and risks should be diversified. A good mix of public and private pension models would allow better diversification of these risks between various pension fund investment risks and macroeconomic risks to national pension schemes. The way in which defined contribution pension plans are organised puts a high level of responsibility on individuals to manage their retirement savings. This includes various decisions such as how much to save annually, which investments to choose, when they should retire, how long they are likely to live, and how to withdraw their savings when they decide to retire. Public measures to improve financial literacy and information campaigns on various specifics of pension insurance can be significantly helpful and of great value.

Various pension reforms, reduced early retirement possibilities and tighter eligibility criteria for other social transfer programmes operating as existing early retirement schemes have had an impact on retirement decisions. When improving the sustainability of the pension system, one of the successful measures has been an increase in the effective retirement age. Finally, an important challenge to current pension systems is the inclusion of non-standard forms of employment and self-employment in contribution-related pension schemes.

Conference review

Jerko Glavaš, Ivana Unukić:
Interdisciplinary Management Research Conference – IMR 2021

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INTERDISCIPLINARY MANAGEMENT RESEARCH CONFERENCE – IMR 2021

The aim of the IMR 2021: 17th International Conference on Interdisciplinary Management Research is to bring together academics, researchers, and practitioners to exchange and share their research findings and (business) experiences in all aspects of management and related fields. IMR is an interdisciplinary platform for academics, practitioners, and educators to present and discuss the latest trends and issues as well as practical challenges encountered and solutions adopted in the field of management, but also in areas such as Business, Financial Economics, Industrial Organization, Law and Economics, etc. The IMR 2021 conference is specially designed for postgraduate students to allow them to present and discuss their research and get feedback on their work from fellow postgraduate students, academics, and practitioners. The environment of the conference is friendly and relaxed, offering Ph.D. students the opportunity to network with academics and practitioners and develop their professional relationships. The 17th conference was held this year, which, just like the 16th, had a special significance due to the COVID-19 pandemic.

1st day of the IMR Conference

The conference started on Thursday (May 13, 2021) at 5 p.m. with the Doctoral Workshop. This workshop allowed our Ph.D. students to present their dissertation topics (as they do every year) as well as to cooperate with mentors related to the dissertation itself.

2nd day of the IMR Conference

The second day of the conference (May 14, 2021) started at 10 a.m. with the Interdisciplinary Management Research XVII opening ceremony. The program was moderated by Ivana Unukić from the Faculty of Economics in Osijek. The speakers were distinguished leaders of the Ph.D. study and the conference, Boris Crnković, Ph.D., Full Professor, Dean, Faculty of Economics in Osijek, Josip Juraj Strossmayer University of Osijek, and Aleksandar Erceg, Ph.D., Associate Professor, Faculty of Economics in Osijek, Josip Juraj Strossmayer University of Osijek, one of the editors of the conference proceedings. Also, a European Union project CROVIZONE - ADAPTATION OF VITICULTURAL ZONES OF THE REPUBLIC OF CROATIA TO CLIMATE CHANGES was presented by Domagoj Karačić, Ph.D., Faculty of Economics in Osijek. Parallel sessions were held from 11 a.m. to 4 p.m. on different platforms, i.e. four sessions were held online via the Zoom platform and two sessions were held live in the conference hall. 90 and 53 participants delivered their presentations via the Zoom platform and live in the conference hall, respectively.

3rd day of the IMR Conference

The third day of the conference (May 15, 2021) was dedicated to the closing ceremony, which took place at 10 a.m. in the conference hall.

The conference was supported by the Ministry of Science and Education of the Republic of Croatia, the Ministry of Regional Development and EU Funds of the Republic of Croatia, the Ministry of Economy, Entrepreneurship and Crafts, and the Ministry of Foreign and European Affairs. In addition, the conference was supported by various donors that, due to the epidemiological situation this year, provided mainly moral support for this scientific meeting.

The latest issue of the conference proceedings, i.e. "Interdisciplinary Management Research XVII" (ISSN 1847-0408), includes 84 papers written by 210 authors from different countries. The sections of the proceedings and the papers are divided into the following six topics: Management (33 papers), Finance Management (14 papers), Economic Development and Growth Management (8 papers), Marketing Management (11 papers), Health, Education and Welfare Management (12 papers), Law and Economics Management (6 papers), and it was divided into two parts (i.e. two books). The Proceedings were published by Josip Juraj Strossmayer University of Osijek, Faculty of Economics in Osijek, Croatia, the Postgraduate Doctoral Study Program in Management, Pforzheim University, Business School, Germany, and the Croatian Academy of Sciences and Arts; with the publishers: Boris Crnković, Ph.D. (Dean, Josip Juraj Strossmayer University of Osijek, Faculty of Economics in Osijek, Croatia), and Thomas Cleff, Ph.D. (Dean, Hochschule Pforzheim University, Germany) and the editors: Dražen Barković, Ph.D. (Faculty of Economics in Osijek), Karl-Heinz Dernoscheg, Ph.D. (International Business School Styria, Austria), Aleksandar Erceg, PhD (Faculty of Economics in Osijek), Jerko Glavaš, Ph.D. (Faculty of Economics in Osijek), Norbert Pap, Ph.D. (University of Pecs, Hungary), Bodo Runzheimer, Ph.D. (Pforzheim University, Business School, Germany), and Dirk Wentzel, Ph.D. (Hochschule Pforzheim University, Germany). The IMR conference proceedings can be found in the following databases: EconPapers, Clarivate Analytics, the National and University Library in Zagreb, EconLit, and EconBiz. This makes the IMR conference even more important and exciting for a large number of academics, entrepreneurs, business people, researchers and visitors. Publication of the conference proceedings is partially funded by the Ministry of Science and Education of the Republic of Croatia.

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Papers must be formatted so as to allow printing on paper size 210 X 297 mm. Times New Roman or Arial font, size 12 (unless otherwise stated herein) should be used, and line spacing should be 1.5.

The margins (left, right, top and bottom) should be 25mm wide. The text should be aligned with both the right and left margins (justified). The paper should have between 4500 and 6500 words. Above the title, in the upper right corner, the authors state JEL classification of the article.

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