Sixth International Scientific Conference
on Economics and Management

EMAN 2022



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EMAN 2022

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How to Cope with Disrupted Times

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Preface

The purpose of the annual EMAN conference is to support the power of scientific research and dissemination of the research results with the objective to enhance society by advancing knowledge; policy-making change, lives, and ultimately, the world. Our objective is to continue to be the foremost annual conference on cutting-edge theory and practice of economics, management, law, tourism, environment, technology through encouraging advancement via excellence, and interaction.

EMAN conference aims to bring together the international academic community (experts, scientists, engineers, researchers, students, and others) and enable interactive discussions and other forms of interpersonal exchange of experiences and popularization of science and personal and collective affirmation.

The annual EMAN conference is committed to the highest standards of publishing integrity and academic honesty ensuring ethics in all its publications. Conformance to standards of ethical behavior is therefore expected of all parties involved: authors, editors, reviewers, and the publisher. The conference organizer follows the Committee on Publication Ethics (COPE) guidelines on how to deal with potential acts of misconduct.

All received full papers prior peer review process are subject to plagiarism check with iThenticate by Turnitin software. Any identified plagiarism automatically disqualifies a paper. Afterward, all full papers are double-blind peer-reviewed by the reviewers drawn from the editorial committee or external reviewers depending on the topic, title, and the subject matter of the paper. Peer reviewers provide a critical assessment of the paper and may recommend improvements. Although the author may choose not to take this advice, editors highly recommend that the author address any issues, explaining why their research process or conclusions are correct.

Association of Economists and Managers of the Balkans headquartered in Belgrade – Serbia along with the partner institutions, namely Faculty of Management Koper – Koper, Slovenia; DOBA Business School - Maribor, Slovenia; Integrated Business Faculty - Skopje, North Macedonia and Faculty of Management - Zajecar, Serbia organized Sixth International Scientific Conference on Economics and Management: *How to Cope with Disrupted Times* - EMAN 2022. Conference was held in Ljubljana, Slovenia (online/virtually).

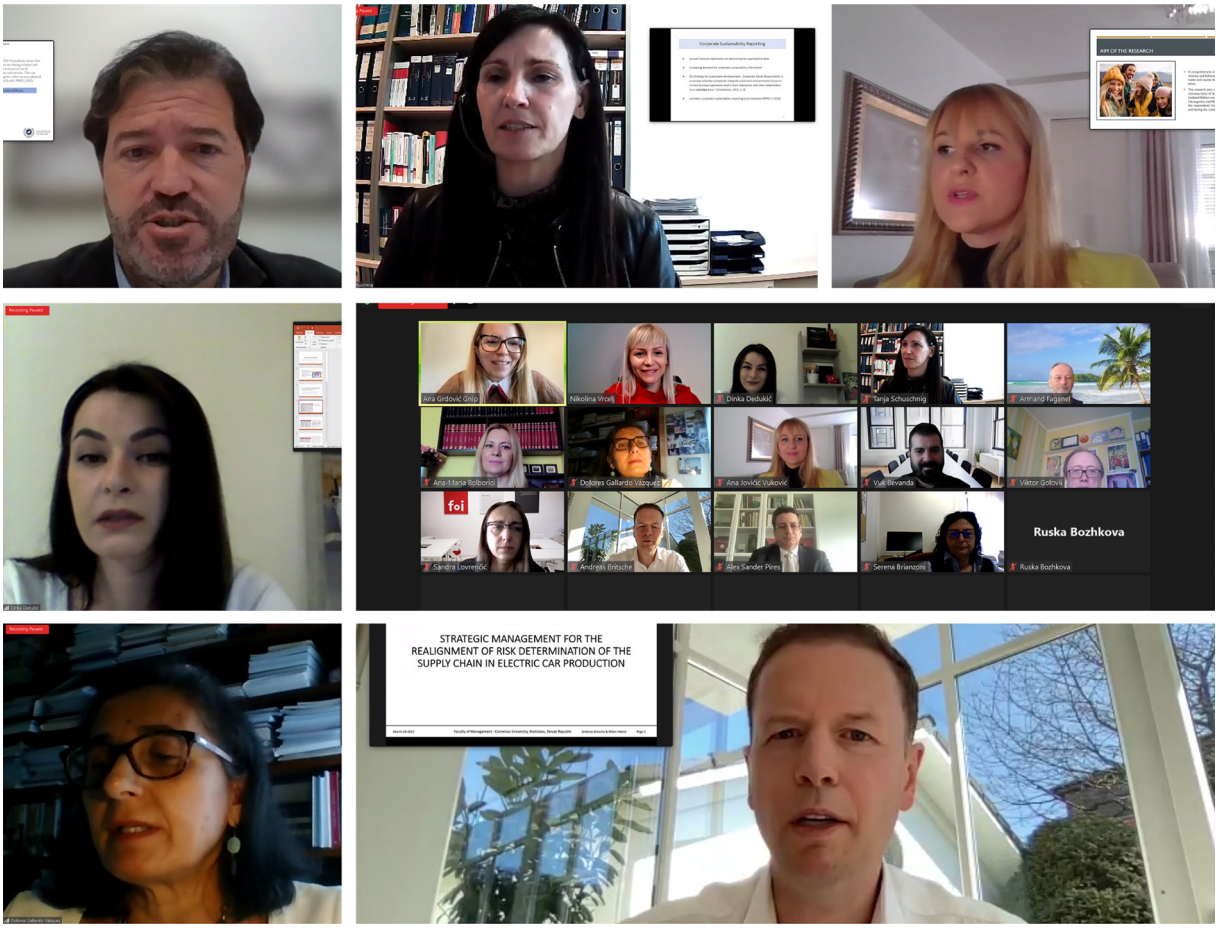
EMAN 2022 keynote speakers were professor Tanja Schuschnig from the University of Klagenfurt, Department for Finance & Accounting, Institute for Financial Management, Austria with the topic: "*Corporate sustainability reporting: current developments and empirical findings from Austria*" and professor Ana Jovičić Vuković from the Novi Sad School of Business, Novi Sad, Serbia with the topic: "*Tourism and COVID-19: case of the Balkan region*".

Within publications from the EMAN 2022 conference:

- **13 double peer reviewed papers** have been published in the *EMAN 2022 – Economics & Management: How to Cope with Disrupted Times - Selected Papers,*
- **36 double peer reviewed papers** have been published in the *EMAN 2022 – Economics & Management: How to Cope with Disrupted Times - Conference Proceedings* and
- **76 abstracts** have been published in the *EMAN 2022 Book of Abstracts.*

Altogether EMAN 2022 publications have more than **600 pages**. All full papers have DOI numbers and ORCID iD integration.

Participation in the conference took nearly **140 researchers** representing **23 different countries** from different universities, eminent faculties, scientific institutes, colleges, various ministries, local governments, public and private enterprises, multinational companies, associations, etc.



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Lockdown Policies and Fiscal Policy Stimulus Packages: Cross-Country Evidence from COVID-19 Era

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Abstract: *Lockdown policies, at the forefront to mitigate the spread of the coronavirus, have led governments to face a trade-off between health and recessionary impacts. To deal with the devastating economic impacts of the pandemic, governments around the world have announced stimulus packages. Given the fiscal burden of health-oriented policies, this study investigates the impact of lockdown policies on fiscal policy stimulus packages. Using simple cross-country OLS regression for 162 countries, this study finds that a stricter lockdown policy requires a higher stimulus package. In addition, threshold regression results indicate that a stringent policy is associated with a higher stimulus package for the countries where income distribution is relatively unequal and institutional quality is relatively lower.*

1. INTRODUCTION

The COVID-19 outbreak has led to an economic downturn all around the world. As a post-crisis fiscal policy response, governments should target to increase the employment level, and living standards of their citizens and contribute the economic development by maintaining social equity (Cottarelli et al., 2014). In line with this argument, governments have adopted a wide range of policies to offset the negative impact of the lockdown on economic activity during the sparking fear caused by the coronavirus disease (Topcu and Gulal, 2020).

Given the closest nexus between the strictness of lockdown policies and decreasing economic activity, a great number of studies[2] attempt to provide different perspectives on how lockdown policies affect the macro economy (see, for example, Busato et al., 2021; Inoue et al., 2021; Konig and Winkler, 2021; among others) as well as financial markets (see, for example, Topcu et al., 2021; Deng et al., 2022; Scherf et al., 2022; among others). In particular, Faria-e-Castro (2021) finds that unemployment insurance is the most effective tool to stabilize borrowers' income among the fiscal policies. Clements and Stam (2020) also discuss that tax measures, as a part of fiscal packages, have played a crucial role in providing crisis relief for firms as well as households. Apart from this literature, this study examines the relation between lockdown policies and fiscal policy stimulus packages using a cross-country analysis. In addition, this study attempts to investigate whether income distribution and/or institutional structure play a significant role in this relationship.

The rest of the study is structured as follows: Section 2 provides the empirical model, data, methods and findings, and Section 3 gives concluding remarks.

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[2] See Brodeur et al. (2021), for comprehensive literature review.

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2. EMPIRICAL SETUP

This study empirically examines the impact of lockdown policies on fiscal policy stimulus packages in 162 countries. Lockdown policies are measured using the recently reported stringency index proposed by Hale et al. (2021). The stringency index is a composite score based on nine response indicators including school closures, workplace closures, and travel bans, rescaled to a value from 0 to 100. Note that a higher score indicates a stricter response. The fiscal package is measured by the fiscal policy stimulus package index proposed by Elgin et al. (2020) and includes all the adopted fiscal measures[3].

We conduct simple cross-country ordinary least squares regressions to estimate the impact that the lockdown policy has on the fiscal package. Regression results reported in Table 1 indicate that a 1-unit increase in lockdown policy increases the size of the fiscal package by around 0,1 units.

Table 1. Regression Results

Variable	**stringency**	**constant**
Coefficient	0.098***	1.886

Observation: 162
*** p<0.01.

Source: Own research

Due to the heterogeneity in the sample, one can assert that the relationship is likely to vary across income levels. We, therefore, use cross-country threshold regression to see whether if there is a threshold income[4]. Regression results reported in Table 2 reveal that a stricter policy requires a higher stimulus package in the countries with less than 1600 US dollars per capita income whereas no significant relationship is detected for the countries above the threshold per capita income. This result addresses that the fiscal burden of lockdown policies in developing countries is higher than in advanced countries.

Table 2. Threshold Regression Results (Income)

Panel	**Lower Income**		**Higher Income**	
Variable	stringency	constant	stringency	constant
Coefficient	0.045***	2.400***	0.055	11.842

Threshold Income Value: 16800.21; Observation: 160
*** p<0.01.

Source: Own research

Birdsall (2001) asserts that inequality often triggers bad economic policies - with ill effects on growth, human development, and poverty reduction. In addition, Samanta and Cerf (2009) show that an increase in income inequality leads to a need for higher government spending. Therefore, one may expect lockdown policies to require the announcement of higher stimulus packages in countries where income distribution[5] is relatively unequal. Cross-country threshold regression results, reported in Table 3, indicate that a stricter lockdown policy is associated with a higher stimulus package in the countries where income inequality is relatively higher than those of the rest where Gini score is slightly less than 33.

[3] See Elgin et al. (2020), for information in detail about dataset.

[4] Income is represented by real GDP per capita measured in constant 2005 US dollars and obtained from the World Bank World Development Indicators Database (2021).

[5] Income distribution is represented by Gini coefficient and obtained from the Standardized World Income Inequality Database (SWIID v.6.0) released by Solt (2016).

Table 3. Threshold Regression Results (Income Inequality)

Panel	**Equal Income**		**Unequal Income**	
Variable	stringency	constant	stringency	constant
Coefficient	0.085	8.336	0.056**	2.296**

Threshold Gini Value: 32.9; Observation: 162
** p<0.05.

Source: Own research

Arvin et al. (2021) find that effective fiscal policies and strong institutions are mutually related, and they are both playing a major role in procuring sustained long-term economic growth. Keefer and Knack (2007) address that public investment is dramatically higher in countries low-quality governance. Cross-country threshold regression results, shown in Table 4, reveal that a stricter lockdown policy leads to an increase in fiscal stimulus package in the countries with relatively lower institutional quality[6] whereas no significant impact is detected for the countries with an average institutional quality score of slightly higher than 76.

Table 4. Threshold Regression Results (Institutional Quality)

Panel	**Lower Institutional Quality**		**Higher Institutional Quality**	
Variable	stringency	constant	stringency	constant
Coefficient	0.050***	2.163**	-0.025	19.368*

Threshold Institutional Quality Value: 74.26; Observation: 161
*** p<0.01; ** p<0.05; * p<0.10.

Source: Own research

3. CONCLUSION

The coronavirus outbreak has created significant fiscal policy challenges given the fact that government revenues have fallen sharply due to declining economic activity caused by the COVID-19 pandemic. Given the tradeoff between health and recessionary impacts governments faced, this study examines the impact that lockdown policies have on fiscal policy stimulus packages using cross-country OLS estimations. Empirical results reveal that a stricter lockdown policy requires a higher stimulus package. Threshold regression results further indicate that a stringent policy is associated with a higher stimulus package for the countries with relatively unequal income distribution as well as lower institutional quality.

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Can Fiscal Decentralization Reduce the Public Sector Size in Europe: An Empirical Study

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Abstract: *The main aim of this paper is to test the Leviathan hypothesis; namely, that fiscal decentralization reduces the size of public sector, using panel data analysis, and employing data for twenty European countries over the period 1999-2016. The Leviathan hypothesis suggests a negative relationship between the public sector size and fiscal decentralization. In the empirical literature, however, there is no clear consensus on whether fiscal decentralization actually reduces the public sector size. Some authors suggest that the effects of fiscal decentralization are quite the opposite - given that the sub-national authorities are better informed about their citizens' preferences, the decentralized provision of public goods might be more efficient and better tailored to the citizens' preferences, which can actually increase the local demand for public services, and hence, the size of the public sector. This research finds no evidence that fiscal decentralization has any effect on the size of the government.*

1. INTRODUCTION

The relationship between fiscal decentralization and the size of the public sector has been widely explored in the literature. However, a conclusive agreement on the sign of the influence of fiscal decentralization on the public sector size has not been reached yet. Different authors use different methodologies and different indicators in their empirical approach and point to different conclusions.

Prohl and Schneider (2009) argue that the growth in public sector size in the most developed economies, especially during the 1980s and 2000s, has motivated both theoretical and empirical studies of the long-term determinants of the public sector size. Oates's decentralization hypothesis (1972, in Prohl and Schneider, 2009) suggests that fiscal decentralization may have a reducing effect on the size of government, implying that government size in the economy may be smaller if government responsibilities for taxes and expenditures are decentralized. Along those lines, Brennan and Buchanan (1980) developed the Leviathan hypothesis where governments, with a monopolistic power of taxation, are seen as leviathans aiming to maximize their size. They argue that the main role of fiscal decentralization is to limit the tax powers of the Leviathan. They further suggested that taxpayers' mobility (i.e., voting with the feet) encourages competitive pressure on local governments to provide public good at the optimal level according to the wishes of the citizens/voters, replacing the explicit fiscal constraints. As a result, Brennan and Buchanan (1980, p. 184) define their leviathan hypothesis, suggesting that "... the total government intrusion into the economy is smaller, the greater the extent to which taxes and expenditures are decentralized". Fiscal decentralization should bring about a smaller and more efficient government because local governments tend to have a comparative advantage in

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resource allocation when compared to the central level of government. In other words, by bringing the government "closer to the people", fiscal decentralization allows for a better match between local preferences and local policies.

As summarized by Kim (2008), there are three main types of decentralization; namely, administrative, fiscal and political decentralization. In this study we focus only on the fiscal decentralization and examine its influence on the public sector size.

Litvack et al. (1998) emphasize that successful fiscal decentralization depends on the institutional design, which can change the impact of decentralization on equity and macroeconomic stability. They particularly emphasize the importance of institutional context in developing countries because their institutions, information and capacities are very weak and that can have an influence on the decentralization process in those countries. Letelier (2005) uses a panel of 64 countries, for the period 1973-1997, to empirically test different hypotheses about the determinants of decentralization. The findings suggest that there is a negative impact of urbanization on the decentralization level. In general, higher per capita income stimulates decentralization, especially in high-income countries. However, the results change when the total government expenditures are divided into different functions.

Makreshanska and Petrevski (2016) empirically investigate the impact of fiscal decentralization on government size using a panel of 28 European countries. The main findings suggest a significant effect of expenditure decentralization on the size of government, especially in former transition economies. However, when they used income decentralization as an explanatory variable, they could not find the evidence to support the Leviathan hypothesis. They also included two measures of vertical fiscal imbalance and provided empirical support for the "common pool" hypothesis only for former transition countries where they rely on tax sharing, central government grants and other forms of intergovernmental fiscal transfers that indeed lead to larger governments. As for the effects of control variables, their results showed that higher public debt leads to larger government, while trade openness is associated with smaller government size. They also found that the effects of population density and dependent population differ between developed and former transition countries (CEE countries), while a higher degree of urbanization reduces government size only in a subset of developed countries. Finally, they confirmed that the global financial crisis has had a strong effect on the level of government spending in Europe.

Fiva (2006) uses data on the decentralization of tax revenues to estimate the relationship between fiscal decentralization and government size, employing panel data from 18 OECD countries from 1970 to 2000. Fiva (2006) differentiates between the revenue measure and the expenditure measure used to calculate the scope of fiscal decentralization, and points to the advantages of the new improved tax revenue decentralization indicator (Stegarescu, 2005).

Jin and Zou (2001) investigate the relationship between fiscal decentralization and the size of government (both total government and different levels of government) using panel data for 17 industrial and 15 developing countries, from 1980 to 1994. They conclude that: (1) decentralization leads to smaller central governments, larger sub-national governments and larger total governments; (2) income decentralization increases sub-national governments less than central governments, leading to smaller aggregate governments; and (3) vertical imbalances tend to increase the size of sub-national, national and aggregate governments.

Cassette and Paty (2009) used panel data for the EU-15 and examine the effect of fiscal decentralization on the aggregate, national and sub-national size of government, separating the long-term effects of decentralization from its short-term dynamics over a 33-year period (1972-2004). They find that in the long run, tax autonomy reduces central-level spending, but increases, to a large extent, sub-national spending, leading to more spending by aggregate levels of government. They also find that vertical imbalances tend to increase the size of sub-national, national and aggregate governments.

2. METHODOLOGY

In order to test the previously stated hypotheses, we employ data for twenty European Union countries in the period 1999-2016[3]. The dependent variable in the estimated model is the public sector size, measured as a share of general government final consumption expenditures in GDP. The independent variable of interest is the extent of fiscal decentralization, measured as the share of sub-national government expenditures in total government expenditures. The control variables used in this model refer only to the economic aspects, and include: economic welfare (measured by GDP per capita), trade openness (measured as the share of imports and exports in GDP) and inflation (measured as the annual change of consumer prices). The choice of control variables is based on the relevant literature on the public sector size determinants. By means of the GDP variable, it is possible to account for the so-called Wagner's law. Wagner's law implies that the size of the government is related positively to the degree of economic development. Since the income elasticity of demand for public goods is greater than one, a higher level of economic development leads to a larger public sector, in absolute and relative terms. In addition, process of urbanization and socio-economic progress in general increases the complexity of the whole system and consequently calls for the expansion of state activities (new laws, institutions, regulations, urban public services). The second control variable; namely, the share of the sum value of imports and exports in GDP, controls for Rodrik's compensation hypothesis. In his seminal paper, Rodrik (1996) suggests that the exposure of an economy to international trade increases the size of its government and demonstrates empirically the robustness of the relationship; namely, it holds for different measures of government expenditures, for both low- and high-income countries, and for a wide range of control variables. The rationale for this finding is that government expenditures play an important role in reducing the external risk that open economies are exposed to.

Using an appropriate econometric strategy and the sample of twenty EU countries in the period 1990-2016, we aim to test the following hypothesis:

H_1 – Fiscal decentralization has an effect on the size of government.

Panel fixed effect model is a simple linear model where the constant term changes with each unit of observation, but is constant over time. The fixed effect model is defined by:

$$y_{it} = \alpha_i + \beta_1 x_{it,1} + \beta_2 x_{it,2} + ... + \beta_k x_{it,k} + \varepsilon_{it} \quad (1)$$

where $i = 1, \ldots, N$ and $t = 1, \ldots, T$

where N denotes the number of observation units, T denotes the number of periods, x_{itk}, $k = 1, \ldots K$ denotes the value of the k-th independent variable, the i-th unit of observation in the period t. Parameter α_i is a constant term different for each observation unit, $\beta_1, \ldots, \beta_k$ are the parameters

[3] The choice of EU countries included in the sample was led by the data availability.

to be estimate. Furthermore, ε_{it} is the error of estimation of i-th observation unit at time t and it is assumed that ε_{it} are randomly and identically distributed random variables by observation units and time, with mean 0 and variance $\sigma_{\varepsilon}{}^{2}$. It is also assumed that all $x_{it,}$ are independent with ε_{it} for all i, t, k.

Random effect model is a simple linear model where it is assumed that the observation units are randomly selected and that the differences between the units of observation are random. Random effect model has the following form:

$$y_{it} = \mu + \beta_1 x_{it,1} + \beta_2 x_{it,2} + ... + \beta_k x_{it,k} + \varepsilon_{it} \quad (2)$$

where μ is a common constant member for all observation units.

The expected impact of independent variables on the dependent variable is given in Table 1.

Table 1. Variables in the model and their expected impact

Variable	Name	Source	Expected effect
Public sector size	*exp*	World Bank Data	
Fiscal decentralization	*sub*	OECD Fiscal Decentralization Database	- or +
GDP per capita	*gdpc*	World Bank Data	+
Trade openness	*medt*	World Bank Data	- or +
Inflation	*infl*	World Bank Data	- or +

Source: Author's calculation

In what follows we estimate first the fixed effect model:

$$\exp_{it} = \alpha_i + \beta_1 sub_{it,1} + \beta_2 gdpc_{it,2} + \beta_3 medt_{it,2} + \beta_4 \inf_{it,2} + \varepsilon_{it}$$

The results of estimation are presented in Table 2. It is shown that a statistically significant effect was found for the control variables used; namely, GDP per capita, trade openness and inflation, but our independent variable of interest; namely, fiscal decentralization appears to be statistically insignificant.

Table 2. Fixed effects model: estimation results

Variable	estimated coefficient	t-value
Fiscal decentralization	.0235211	1.31
GDP per capita	.0000356	3.88
Trade openness	-.0172209	-3.62
Inflation	-.0789251	-2.28
constant	20.04915	31.76

Source: Author's calculation

We then proceed with the estimation of the random effect model and the obtained results are listed in the second column in Table 3. The results are quite comparable to the results obtained in the fixed effects model; namely, GDP per capita, trade openness and inflation are statistically significant. In this model, however, the fiscal decentralization variable proves to be statistically significant, suggesting a positive effect of fiscal decentralization on the size of government.

Table 3. Radom effects model: estimation results

Variable	estimated coefficient	z-value
Fiscal decentralization	.0329468	2.03
GDP per capita	.00000323	3.61
Trade openness	-.0154417	-3.47
Inflation	-.0822643	-2.39
constant	19.75228	24.90

Source: Author's calculation

3. RESULTS AND DISCUSSION

In order to decide which of the two models, fixed effects or random effects, is more appropriate, Hausman test is employed. The results suggest that fixed effects model is preferred compared to random effects model; hence, we focus on the obtained results from the fixed effects model estimation.

As shown in Figure 2, all variables, except for the fiscal decentralization, are statistically significant. In other words, we accept the hypothesis that fiscal decentralization has no real effect on the size of government. The rationale for this finding lies in the possibility that the two opposing effects of fiscal decentralization on public sector size cancel each other out, rendering the overall effect insignificant. As for other significant effects, GDP per capita exerts a small, but positive effect on the size of government, which is in line with Wagner's Law. The negative sign of the trade openness variable indicates that more open economies seem to have smaller governments, which is opposite to Rodrik's compensation hypothesis, but supports the idea that countries are competitors in the international market and by reducing the government size, they attempt to become more attractive in the international market. The effect of inflation is also negative, suggesting that countries with a higher level of inflation have smaller governments.

4. CONCLUSION

This research is an essential empirical study of the relationship between fiscal decentralization and the size of the public sector. The countries investigated are the following EU-20: Belgium, France, Italy, Luxembourg, the Netherlands, Germany, Denmark, Ireland, the United Kingdom, Greece, Portugal, Spain, Austria, Sweden, the Czech Republic, Estonia, Latvia, Hungary, Slovakia and Slovenia, and the time coverage is 1999- 2016. The advantage of this research is that our panel data are balanced, that is, data are available for each observation unit in each period and for all selected variables. After estimating the specified model using both the fixed and random effects model, the preferred model proved to be the fixed-effects. The obtained fixed effect estimates indicate fiscal decentralization has no impact on the size of the public sector in the selected European countries. In other words, this study finds no evidence for the Leviathan hypothesis which suggests that countries with higher degree of fiscal decentralization have smaller governments.

Within the empirical literature on the size of government and fiscal decentralization, there is still much room for improvement. One of the issues particularly important is the problem of measurement for both fiscal decentralization and public sector size.

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Debt Financing during COVID-19 in Albania: Businesses by Activity

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Abstract: *The first months of 2020 changed life dynamics, both individually and globally. Concern about physical health was soon followed by concern about financial health. Companies, as the main contributors to society, faced a multitude of liabilities and costs, which they were not prepared for. The paralysis of economic activity inevitably led to a money supply deficit. This compelled governments, in cooperation with financial system agents, to alternate mechanisms that would hopefully curb the 'domino' effect but also inhibit a deep economic recession. The lack of liquidity to survive and operate throughout the pandemic was a prevailing problem of the time. This article, quite distinct from others, aims at analysing how businesses, by nature of the activity, used debt as an instrument to survive Covid-2019. In addition to the analysis of the use of financial resources by third parties (in this period mainly bank loans), the authors study also their trend, before Covid-19, in the first wave and a year later under the presence of coronavirus.*

1. INTRODUCTION

This century, in addition to the intensive development of technology, innovation and globalization, has also been marked by the presence of respiratory epidemics (SARS in 2002/2003, MERS in 2012 and Covid-19 in 2019) which threaten to restrain the life and development of global society. SARS-CoV-2 (Li et al, 2020), otherwise known as Covid-19, was rated as one of the harshest of all time with a rapid spread and severe socio-economic consequences. It all started in a Chinese province and then spread to 114 countries with the same intensity as the disease itself. The idea of the danger posed to health and socio-economic well-being was far-fetched for everyone until WHO (World Health Organization) declared Covid-19 a global pandemic (WHO, 2020). The first official patient in Albania was registered on March 9, 2020, alerting society to the presence of an unknown disease. Despite the restriction measures, in April of the same year, the country had the highest case fatality rate in Southeast Europe (Puca et al, 2020). The poor quality healthcare system brought the country to its knees. In addition to healthcare, society immediately felt the first risks threatening the economy. Many businesses closed their doors, shutting down their operations and drastically reducing their liquidity. This closure gave rise to difficulties for both the non-financial and financial sectors.

Developing countries have a high rate of debt dependency on the banking system, making businesses and individuals more vulnerable to macroeconomic factors and tight credit conditions (OECD, 2021). However, Albanian businesses, except large ones, are inclined towards internal financing or borrowing funds from family and friends to finance their operations (Kacollja et al., 2021). About 60% of businesses in Albania operate by using debts (Cani&Cani, 2020), but

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it is not enough. Access to financial resources is ranked as one of the most problematic factors for Albanian businesses, along with taxation and corruption (Kacollja et al., 2021). The pandemic inevitably aggravated their situation, but there is still no data referring to the present day, in particular, regarding businesses going back towards financial stability. Therefore, the purpose of this paper is to analyse whether debt levels for these businesses went back to normal a year after the onset of this severe virulence. For the purpose of carrying out this study, the authors have collected data from businesses for the period: before the pandemic; during lockdown due to the pandemic; after reopening, and in the presence of pandemics.

2. LITERATURE REVIEW

For both advanced economies and developing countries, the COVID-19 pandemic has reinforced the importance of business continuity planning for cash and debt management (Balibek, & Storkey, 2021). Nguyen & Dinh (2021) state that debt management is the most popular and effective tool to ensure the financial stability of companies during a crisis. In a critical assessment of banking theories, Stefano Sgambati (2019) provides some general criteria for distinguishing debt from leverage. According to his scheme, debt comprises borrowing to pay off expenses and pay off liabilities, while leverage stands for borrowing to invest in assets with the intent to make profits in the future. These definitions have intuitive appeal and can be illustrated with simple examples.

The decline in liquidity prompted the need to increase debt to cover costs and liabilities. However, this situation is fluid and uncertain making even short-term projections about the aftermath of the pandemic difficult (Baines & Hager 2021). Chiu et al (2021) go further by stating that excessive debt burdens may negatively affect the well-being of companies in the long-term perspective. At the same time, businesses, already desperate before the onset of the pandemic, now find themselves caught between a rock and a hard place, which is not good enough either to access debt markets nor to receive emergency financing (Baines & Hager 2021).

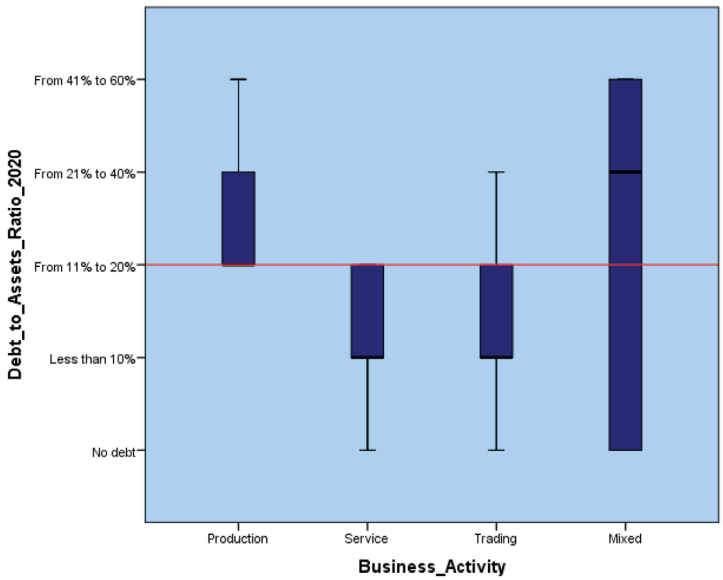
3. METHODOLOGY

Research methodology is a collective term for the structured process of conducting research. There are different methodologies used in different types of research and the term usually encompasses research design, data collection and analysis. Research methodologies are classified into qualitative and quantitative, thus establishing a great division among researchers (Onwuegbuzie and Leech, 2005). Miles and Huberman (1994) argue that qualitative research focuses on an in-depth examination of research issues while Harrison (2001) argues that quantitative design provides a broader understanding of the issues being researched. This paper makes use of the quantitative method of inferential statistics, the cross-quadratic distribution of variables and their comparison.

4. ANALYSIS OF RESULTS

The paper aims to analyse how businesses, by nature of the activity, used debt as an instrument to survive Covid-19. In order for the purpose, the focus of study, results and findings to be sequential in this paper, the analysis of exploratory data using statistical programs and techniques have been employed. During the analysis of the results and findings, the “Boxplot” graphical representation was applied, which is used to summarize and visually compare the data sets. The use of boxplots is intended to improve the interpretation of the data provided. Boxplots serve as a tool that can improve our reasoning for the quantitative information provided in this paper.

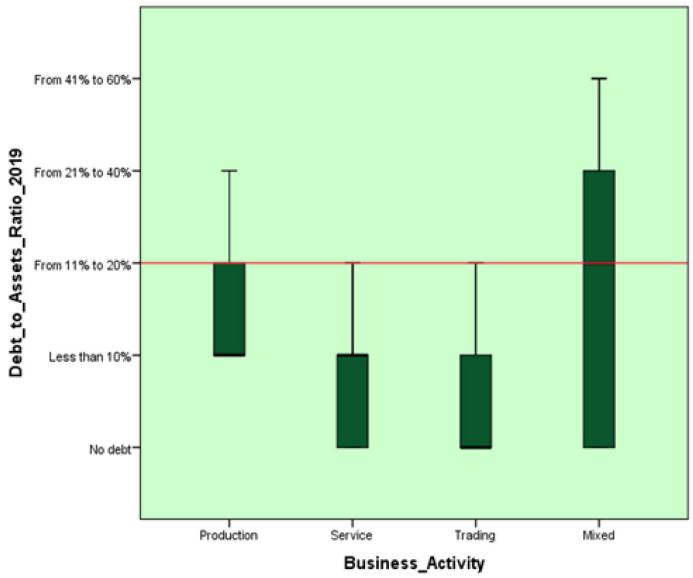
For 2019, 75% of the total number of production businesses showed a debt ratio of up to 20%, while only 25% of them had a debt ratio of 20%-40%. The service and trading businesses at an extent of 100% had a debt ratio of 0%-20%, where 75% of them have a debt ratio of less than 10%. Mixed businesses, given their very nature, extend into a wider range of debt ratio values. 75% of them have a debt ratio of 0%-40%, while only 25% of them have a debt ratio ranging from 41%-60%.



Graph 1. Cross-sectional distribution of debt ratio for businesses by activity, 2019

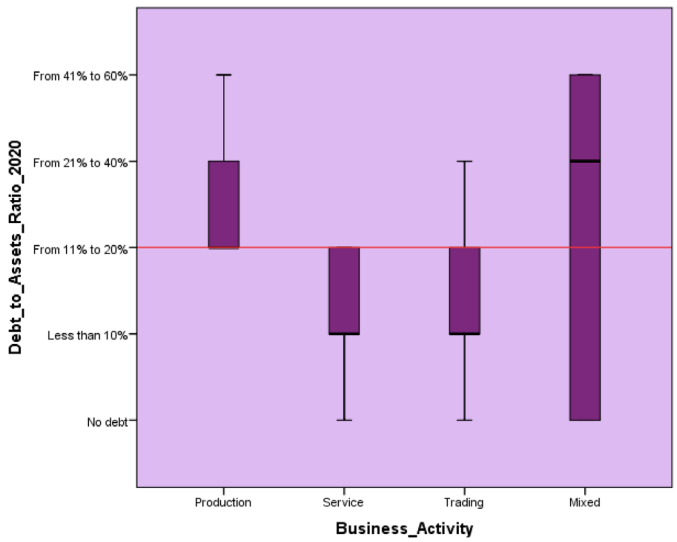
Based on the graph of the cross-sectional distribution of debt ratio for 2020 as a pandemic year, it is evident that all types of businesses have experienced an increase in the debt ratio. Hence, the debt level in the production business has a significant increase, for all businesses of its kind. 100% of these businesses have a debt ratio of over 10%, while 75% of the debt ratio varies from 10% to 40%. 75% out of the total number of service and trade businesses have a debt ratio of 10%-20%.

Concerning mixed businesses, it was noted that while 25% of them had a debt ratio at the extent of 21%-60% in 2019, their number doubled to 50% in 2020.



Graph 2. Cross-sectional distribution of debt ratio for businesses by activity, 2020

For 2021, known as the year after the 'closure' due to Covid-2019, businesses attempt going towards the debt ratio equilibrium back to pre-pandemic debt levels. 50% of the production businesses managed to reduce the level of debt in the parameters of 2019.



Graph 3. Cross-sectional distribution of debt ratio for businesses by activity, 2021

Moreover, 25% of the service business stabilized the debt ratio (less than 10%) by joining 25% of businesses of this type, which maintained this level of debt even during the 2020 pandemic year. The trade business stands out as it stabilizes the debt ratio at the extent of less than 10%, with some negligible exceptions for statistical evaluation (4 outliers). Mixed businesses likewise are inclined towards balancing the debt ratio with the levels of 2019.

5. CONCLUSION

The damage caused by a crisis such as Covid-19 continues long after its end, for dimensions that vary from employees and their families to countries and around the world as well (Achim et al., 2021).

One of the ultimate goals of any disaster situation is to return to "business as usual" (Reuter et al., 2018). However, cluster analysis may also be useful, grouping companies according to their sectoral sensitivity to the COVID-19 pandemic. From the graphical analysis of the boxplots, it is noted that almost all the analysed sectors maintain the same debt ratios as before the outbreak of the Covid-19 pandemic. This suggests that timely debt management is an effective tool in response to the rotating COVID-19 pandemic (Nguyen & Dinh 2021).

The results of our work are also of interest to policymakers as this pandemic continues to be unpredictable. The financial response of businesses to their recovery during Covid-2019 has been different in different sectors. Moreover, just like the governments of other countries, the government in our country needs to know how businesses react to the pandemic, which sectors of activity are most vulnerable to the effects of the crisis and the key financial management decisions they need to make during the crisis.

The current study has some limitations regarding the short analysis period and the truncated nature of the data. It would be of interest to have a more extensive dispersion of sectors and the use of concrete financial data provided by the financial statements of these businesses.

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Twin Deficits: Apparition or Reality for Albania

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Granger causality;
VECM

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Abstract: *This study examines the validity of the Keynesian Twin Deficits hypotheses (TDH) for Albania, using time series data of the span period from 2008 to 2021. The twin deficit hypothesis implies a long-run positive correlation running from the budget deficit to the current account deficit. For this, the Stationarity test, the Johansen co-integration test, the Granger causality, and VEC model techniques are used to examine the long-run and short-run relationship between budget balance, current account deficit, and real growth rate. The empirical findings suggest that the Keynesian twin deficits hypothesis is not valid in the context of the Albanian economy, the budget deficit has a negative relationship to the current account deficit. The policy implication of the results is that prudent management of the fiscal budget of the government may not prove to be a suitable policy instrument for the evaluation of the current account balance improvement.*

1. INTRODUCTION

Many countries are experiencing negative balances in the budget account in the last decades. Large fiscal deficits can have negative impacts on the current account balance and the real economic growth rate. The analysis of the mechanism of the relationship between budget deficit, current account deficit, and economic growth rate movements became a source of economic debates in the literature. Moreover, the study of their relationships is of great empirical importance for policy purposes.

From a theoretical viewpoint, the link between budget deficit and current account deficit is usually referred to as the *Twin Deficits Hypothesis* (TDH), and it means that the budget deficit will be associated with a current account deficit. It first emerged in the 1980s, when a significant deterioration in the U.S. account balance was accompanied by a sharp rise in the federal budget deficit (Miller & Russek, 1989). Public expenditures which are considered to play a central role in periods of recessions seemed to have an impact on the country's growth rates. The need for expansionary or contractionary fiscal policies to restore long-run economic equilibrium is postulated by the Keynesian, New Keynesian, and Post-Keynesian schools of thought. Fiscal expansion is often used for stimulating economic growth, however, this is followed by revenue shortages, sequenced by the deterioration of the future budget balances within these countries. Government, under debt circumstances, in most cases tends to rely on foreign sources of funds rather than using domestic financial funding (Dornbusch, 1984; Fischer & Easterly, 1990). This has the tendency to adversely affect the overall current account balance of the economy.

The phenomenon of the simultaneous deterioration in budget and current accounts is known as the twin deficits hypothesis (TDH) and supposes that budget deficit is likely to stimulate an increase in the current account balance (CAB) as well (Abell, 1990). There are two main approaches that analyze the relationship or the link between budget deficit and current account deficit. The first is the Keynesian income-expenditure absorption approach and the Mundell- Fleming

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(FM) model, which supports the twin deficits hypothesis. From the Keynesian income-expenditure approach, an increase in the budget deficit will cause the existence of increased disposable income, which will induce higher domestic demand and import expansion resulting in the worsening of the current account balance. According to the Mundell-Fleming model framework, an increase in the budget deficit would put increasing pressure on the domestic interest rate above the world rate, triggering capital inflows and causing the local currency exchange rate appreciation. Thus, deteriorating the net export and current account position, the export become less competitive in foreign markets while the imports become cheaper (Hatemi & Shukur, 2002).

The second model is the Ricardian Equivalence Hypothesis (REH), which rejects the twin deficits hypothesis. In contrast to the Mundell-Fleming model, the REH postulates that expansionary fiscal policies will not have an impact on the current account balance. The higher disposable incomes resulting from the increased government budget deficit will not lead to an increase in aggregate demand, because rational households in the current period have expectations that higher taxes will be imposed in near future. In view of this, households do not consider themselves wealthier; they will save the additional transitory incomes to pay their increased tax liabilities in the future. Consequently, the private savings will increase equivalently to the reduction in public savings, and the demand for both domestic goods and imports will not increase to the extent that the current account will deteriorate (Abbas, Hagbe, Fatas, & Velloso, 2010; Corsetti & Müller, 2006).

Situations of high budget deficits and recurrence of high and long-term current account deficits spurred out from the latest global financial crisis of 2008 in the USA, and many European countries' debt crises of 2010. In the last two decades, Albania has also been experiencing deteriorated records of high budget deficits of up to 7.9% of GDP and current account deficits of up to 15.63% of GDP (Worldbank, 2021; MF, 2021). While the economic growth rate of the country has been moderately high in the last decades, despite the decrease in recent years due to natural disasters such as the earthquake in 2018 and Covid pandemic in 2019 (INSTAT, 2022).

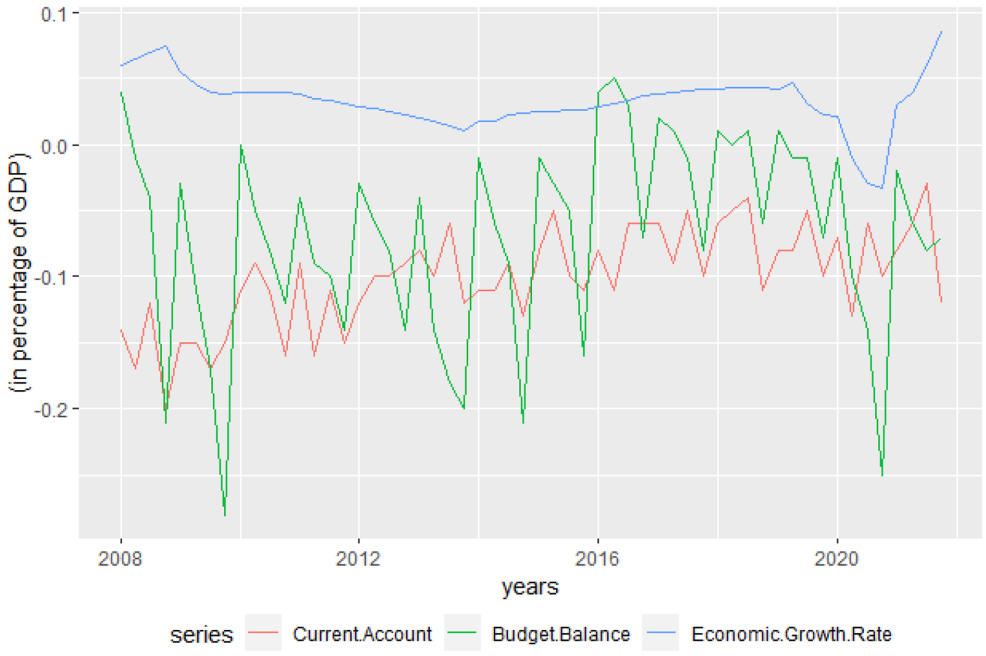

Figure 1. Budget Balance, Current Account Balance, and Economic Growth Rate of Albania 2008-2021.

The empirical investigation of testing the validity of the twin deficit hypothesis for Albania is of special importance from the point of view of the country's macroeconomic stability, especially in the long run. For this purpose, quarterly data on real economic growth rate, the government budget balance and the current account balance in ratio of GDP of the period 2008-2021 are applied in several econometric models and methods including the VEC model. The VEC model consists of VAR model (short-term dynamics) and cointegration (long-term co-movement) that tests for long-run relationship between the variables employed, reflecting the features of a long-run convergence between the budget deficits, the current account deficit, and economic growth rate.

2. LITERATURE REVIEW

2.1 Theoretical Framework

According to the national macroeconomic accounting approach, in the balance of payments, the current account balance equals national savings minus private investments. An increase in budget deficit results in a reduction in public savings as a result of a decrease in national savings and consequently deterioration in the current account balance. The response of the current account balance to an increase in government budget deficit will depend on the behavior of the private sector and the behavior of the households, which can offset or expand the impact of the fiscal expansion on the current account balance. The framework of national account identity defines a clear relationship between budget deficit and current account balance:

$$Y = C + I + G + (X - M) \tag{1}$$

Where Y - gross domestic product (GDP), C – private consumption expenditure I - private investment spending G - total government purchases of goods and services X - total exports of goods and services M - total imports of goods and services, and $(X - M)$ - current account balance (CA).

Referring to the national income identity, the national saving can be written:

$$Y - C - G = I - (X - M) \tag{2}$$

or

$$S = I - CA \tag{3}$$

where $CA = (X - M)$ and $S = Y - C - G$ stands for national saving. Furthermore, the national saving can be decomposed into government savings (Sg) and private savings (Sp):

$$S = Sg + Sp \tag{4}$$

$$Sg = T - G \tag{5}$$

$$Sp = Y - T - C \tag{6}$$

Rearranging the equations,

$$CA = Sp + Sg - I \tag{7}$$

Identity (7) suggests that the current account balance (*CA*) is the sum of private savings and government savings minus private investment spending. It assesses the relationship between current account balance *CA* and government budget balance ($Sg = T - G$) and explores the sustainability of the Keynesian Twin Deficit Hypothesis.

2.2. Empirical Evidence

After the emergence of Keynesian economics, the concept of government deficit financing has been found to be significant. But other mainstream theories, like the neo-classical theory, argued that fiscal deficit will have an adverse impact on the economy. To analyze this relation empirically a lot of studies are presented in the field using different econometrics approaches, and results based on different time-span time series data.

Fiscal deficit & Growth: Fiscal deficit is often discussed to be an important factor to influence the country's output growth. Martin and Fardmanesh (1990) in a study of 76 developed & developing countries, analyzed the impact of a few fiscal variables on economic growth for the span period from 1972 to 1981. Using cross-sectional linear regression, the authors showed that total expenditure has a positive relationship to the economic growth rates, while tax revenue and deficit have negative relations. By categorizing the countries into low, middle, and high-income groups they discovered negative relation between deficit and economic growth rate resulting only for the middle-income countries but not for low and high-income groups of countries. The outcome seemed to be inconsistent as low-income countries show the necessity of more government expenditures in order of employing the existing unutilized resources (Martin & Fardmanesh, 1990). Keynesian theories, emphasizing growth and development, were taken into consideration by researchers who have been testing the expanding public-sector and economic-increase hypothesis. The results showed that the public investment was not of much significance to the growth rate, and the budget balance although negative was insignificant indicating no relationship to the economic growth rate (Nelson & Singh, 1994). Furthermore, government seigniorage financing of deficit was found to be growth deteriorating, as well as limit values of fiscal deficit of more than 1.5% of GDP, while limit values of fiscal deficit less or equal than 1.5% of GDP were found to be growth-enhancing. Categorization of public expenditure into productive expenditure and residual expenditure served as another analysis presenting a significant positive relation of the first category to the growth rate, while a negative relation of the second category (Adam & Bevan, 2005). Many econometric empirical results verified the historical pattern of the Keynesian approach after the great recession in the USA (2007-2009) and further suggested that there was a strong positive effect of the higher deficit on the country's economic growth, even when possible increases in the interest rate were taken into consideration (Taylor, Proano, Carvalho, & Barbosa, 2011).

Fiscal deficit & Current account balance: Studying the twin deficits hypothesis was of great interest since the 1980s because of the increasing phenomenon in many countries in the world. The twin deficit analyses were initiated from the synchronized deterioration of the United States' budget and current account balances in the 1980s. The theory was initially thought to be applicable in the context of only developed economies (Hutchison & Pigot, 1984; Hutchison, Michael & Throop, 1985; Fountas & Tsoukis, 2004). However, empirical research studies in the relevant macroeconomic discourse suggested that the twin deficit hypotheses were prevalent as well within the less developed economies (Fidrmuc, 2003; Baharumshah, Lau & Ahmed, 2006). Persistent budget deficits seem to be a popular characteristic of developing economies around the globe (Klitgaard, 1989). Khalid and Teo (1999) argued that a high correlation between the two

deficits is more likely to appear in less developing countries than in developed ones. This is due to the differences in the composition of the economy and the different macroeconomic dynamics governing the two deficits (Khalid & Teo, 1999).

The theoretical debates over the twin deficits correlation have generated several studies with different investigating techniques. A lot of researchers have empirically examined the causality link between fiscal deficit and current account deficit in various countries. However, the findings of the studies varied within a country and across countries, most likely due to the variation in methodologies, sample sizes, data used, and different periods covered in the econometric analysis. Early empirical studies on the twin deficits hypothesis mostly focused on the United States where was the initial issue awareness. Most of these studies confirmed that in the United States budget deficits contribute to current account deficits (Barro, 1989; Diboo_lu, 1997; Hatemi & Shukur, 2002)

Along the same line, a lot of studies have investigated the connection between the two deficits in developed countries such as Canada, the Group of Seven (G7), the Organization for Economic Cooperation and Development (OECD), and European countries, using various estimation methods (see Ahmed & Ansari, 1994; Aslan, Buyrukoglu, Oz, & Nazlioglu, 2014; Bluedorn & Leigh, 2011; Forte & Magazzino, 2013). The results of these studies validate the twin deficits hypothesis.

The twin deficits hypothesis has also been examined in a group of developing economies or regions, focusing on cross-country studies. Examples include Central Eastern European countries (Aristovnik, 2008), Baltic countries (Sulikova, Sinicakova & Horvath, 2014), African countries (Ahmad, Aworinde, & Martin, 2015), Asian countries (Anoruo & Ramchander, 1998), Southeast Asian countries (Kinza & Kashif, 2016), SEACEN countries (Lau & Baharumshah, 2006), and ASEAN countries (Baharumshah, Lau, & Khalid, 2006). The empirical investigations from these studies indicate that current account deficits are influenced by budget deficits, but also nonsupport evidence is reported on specific case countries.

On the other hand, several studies have investigated this relationship for individual European economies such as Greece, Germany, Portugal, Ireland, Italy, Greece, and Spain (Kalou & Paleologou, 2012; Trachanas & Katrakilidis, 2013). Almost all these studies confirmed the existence of the twin deficits phenomenon in the respective countries. But there are also other contradictory results for the same countries that present the rejection of the twin deficit hypothesis respectively (Algieri, 2013).

In this regard, studies are performed also in developing economies, which are no exemptions from similar analysis. Several authors have presented often contradictory results in the different countries' case studies. In Turkey, China, Pakistan, and Nigeria almost all studies showed results of the validation of twin deficit (Idil, 2010; Banday & Aneja, 2019; Mifukhtar, Zakaria, & Ahmed, 2007; Dayo, 2012). In other economies such as Egypt and Peru, model results failed to support the twin deficits hypothesis (Omneia & Chahir, 2015; Sobrino, 2013). A summary of the empirical literature review on twin deficits is presented in Table 1.

Although there is a considerable number of empirical studies on the twin deficits hypothesis, little has been done to examine the issue in Albania. Results of the Granger causality test, with nominal data of the period 1991-2014 in Albania, show that there is unidirectional causality from budget deficit to current account deficit (Kalaj & Mema, 2015).

Table 1. Summary of Empirical Literature Review on Twin Deficits

Author (s)	Country (ies)	Period	Method	Findings
Diboo_lu, 1994	USA	1970-1993	VAR, VEC	Support of twin hypothesis
Bluedorn & Leigh, 2011	17 OECD European countries	1978-2009	OLS Regression by Delta method, Impulse Responses	1% of fiscal consolidation raises the current account balance to 0.6%/GDP ratio, supporting the twin deficits hypothesis
Forte & Magazzino, 2013	33 European countries	1970-2010	Generalized Least Squares-Fixed Effects	1% increase in the budget deficit, deteriorates the current account/GDP ratio of 0.37%
Aristovnik, 2008	Eastern Europe and former Soviet Union	1992-2003	Parks-Kmenta, PCSE	Validity of twin deficit in the region
Anoruo & Ramchander, 1998	Developing of Economies of Asia	Countries' time span 1957-1993	Granger causality, VAR	Trade deficit causes a fiscal deficit
Kinza & Kashif, 2016	South Asian Countries	1981-2014	Granger causality, VAR ARDL	No evidence of the twin deficit hypothesis in all countries in the long run
Sulikova, Sinicakova, & Horvath, 2014	Baltic countries	1992-2011	Vector Error correction (VEC)	Significant long-run positive relation in most countries
Ahmad, Aworinde & Martin2015	African countries	1980-2009	Vector Error correction (VEC)	Support of twin deficit in six out of the nine countries examined
Magazzino, 2017	**APEC countries**	**1980-2013**	**Panel VAR**	**There is a two-way causality between the two deficits**

Source: *Author's descriptions*

3. METHODOLOGY

A set of econometric methods such as Stationarity test, Johansen test, Granger causality, vector error correction model (VECM), and impulse response functions (IRF) are used to investigate the relationship between the deficits. Time series data are pretested for unit root and cointegration which determine the use of the VEC model as the most appropriate econometric method to use. The VEC model provides a measure of the short-run correlations and long-run equilibrium relationships between the variables. The VEC model is tested for sustainability using diagnostic tests. R software is used for econometric analyses.

Stationarity Test is used to test the stationarity of the time series variables. This in order to avoid a spurious regression model when inserting nonstationary variables in the model in their level forms. There are various stationarity tests used in different economic literature. In this study it is used Augmented Dickey-Fuller Unit Root Test (ADF) which takes the following form:

$$\Delta Yt = \infty + \beta\, t + \rho\, Y\, t - 1 + \sum_{j=0}^{p} \delta\, \Delta\, Yt - j + \varepsilon\, t \qquad (8)$$

It is noticed that the first difference of the variable of concern is regressed on a constant term, linear trend, and the first lag and other lags of the dependent variable, confirm no autocorrelation in the error term.

Cointegration test: It is known that if the variables are nonstationary, then a cointegration test should be performed before being used in order to avoid a spurious regression. Cointegration

test checks if there is a stable long-run equilibrium relationship between them over time. If the variables are cointegrated, then they could be used in the regression model in the level forms. There are various tests used for the cointegration of time series variables; this study uses the Johansen Cointegration test. This test has an advantage over other previously mentioned tests as it takes into consideration the possibility of multiple cointegrating vectors.

Causality test: The regression model indicates only the statistical relationships between the dependent variable of concern and other independent variables, but it does not indicate the direction of the relationship and its causal relationship. There might be independence between the variables, a unidirectional causality relationship, or a bidirectional relationship running from one variable to the other one. The Granger causality test is used to investigate the direction of the causal relationship among the variables in our empirical model. The intuition behind Granger causality tests can be expressed using the following equations:

$$\mathrm{Yt} = c1 + \sum_{j=0}^{p} \alpha 2, \mathrm{j}\, \mathrm{Yt} - \mathrm{j} + \rho\, \mathrm{Y\,t} - 1 + \sum_{j=0}^{p} \beta 2, \mathrm{j}\, \mathrm{xt} - \mathrm{j} + \varepsilon \mathrm{x}, \mathrm{t} \quad (9)$$

If a specific variable (Y) can be forecasted by its own lagged values as well as the current and lagged values of another variable (X), (X) it is Granger-cause (Y). If both βs and s were significant, it means that a feedback causal relationship exists between (Y) and (X); if both βs and θs were insignificant, it means that (Y) and (X) are independent of each other. If only βs in equation (1) was significant and s are insignificant in equation (2), it means that (X) granger causes (Y), and vice versa.

Vector error regressive model (VEC): Vector error correction model (VECM) is used when time series variables are non-stationary and have at least one positive cointegration. VEC consists of a vector autoregressive model (VAR) and error correction equation, and it is used when there is the presence of long-term equilibrium relationships.

In principle, in the context of vector time series modeling, there are three basic pairs of models. Given a vector of endogenous variables Xt = (X1, X2…, Xt): First, a VAR with stationary level variables (Xt) is used when all variables are stationary in level (Xt):

$$\mathrm{Xt} = \mathrm{c} + \beta 1 \mathrm{Xt}{-}1 + \beta 2 \mathrm{Xt}{-}2 + \ldots + \epsilon \mathrm{t} \quad (10)$$

Second, a VAR with stationary growth variables (ΔXt) is used when all variables are non-stationary in level (Xt):

$$\Delta \mathrm{Xt} = \mathrm{c} + \beta 1 \Delta \mathrm{Xt}{-}1 + \beta 2 \Delta \mathrm{Xt}{-}2 + \ldots + \epsilon \mathrm{t} \quad (11)$$

Third, a VEC model is used when all variables are non-stationary in level (Xt) and there are some cointegrations in level (ΠXt) (Johansen & Juselius, 1990). The VEC model consists of a VAR with stationary growth variables (ΔXt) and error correcting equations with non-stationary level variables (Xt).

$$\Delta \mathrm{Xt} = \mathrm{c} + \beta 1 \Delta \mathrm{Xt}{-}1 + \beta 2 \Delta \mathrm{Xt}{-}2 + \ldots + \Pi \mathrm{Xt}{-}1 + \epsilon \mathrm{t} \quad (12)$$

where ΠXt−1 represents long-term relationships among non-stationary level variables and is the first lag of linear combinations of non-stationary level variables or error correction terms.

Since our data results content consists of non-stationarity and cointegration, the VEC model will be analyzed in the long term for the vectors of fiscal budget deficit and current account deficit time series. In the VAR model the lag length (p) is selected by using the information criteria as AIC, HQ, SC, and FPE. In these criteria, the lowest value is chosen since these criteria penalize models that use more parameters. The VECM model consists of VAR model (short-term dynamics) and cointegration (long-term co-movement). The cointegration indicates one or more long-run equilibriums or stationary relationships among non-stationary variables. The following 5 steps are taken:

1. decomposition of quarterly time-series data,
2. testing for non-stationarity,
3. testing for cointegration (r),
4. estimate VECM model (if $r > 0$),
5. test the VEC stability test.

4. RESULTS

Quarterly data series of the budget balance, current account balance, and economic growth rate (in ratio of GDP) spanning from the first quarter of 2008 to the last quarter of 2021 are used. Given the quarterly data and seasonality theoretical considerations, it is investigated the effect of real variables in the ratio of GDP, and nominal variables in levels are not included in the analysis. Data are retrieved from the Institute of Statistics, Ministry of Finance, and World Bank database (2022). The tests and models are performed using the R econometric software.

The econometric analyses start by testing the stationarity of the time-series variables. For this, the Augmented Dickey-Fuller Test (ADF) unit root analysis is performed to test the null hypothesis of non-stationarity. The results in Table 1 show that both budget balance and current account balance time series data are non-stationary at the levels (5% significance level).

Table 2. Augmented Dickey-Fuller (ADF)

	Lag	ADF t-Statistic	Prob.
Budget Balance	3	-1.5403	0.6653
Current Account Balance	3	-2.2164	0.3038
Economic Growth Rate	3	-3.557	0.0719

Source: Author's calculations

After verifying that the sample data are non-stationary, it is proceeded with the Johansen test for cointegration to determine whether there are long-run relationships between the variables. For this procedure, the optimum lag length in the VAR model is chosen from Akaike's information criterion, because in cases of small samples (60 observations and below), it is superior to the other criteria as minimizes the chance of underestimation while maximizing the chance of recovering the true lag length (Liew, 2004). This selection procedure has led us to choose a lag of 3. There are two variants of the Johansen tests, the trace statistics approach, and the maximum eigenvalue approach. In this analysis, it is used the trace statistic approach as the most common approach. The results show that at 5% critical values, the test statistic exceeds the critical value of the null hypothesis H0: $r = 0$, and it is rejected. Therefore, $r > 1$ means that there is at least one cointegrating relationship between the variables in the long run. These findings provide justification for applying the VEC approach rather than the VAR model.

Table 3. The Johansen Test of Cointegration

	Test statistic	Critical values		
		10%	5%	1%
r <= 2	2.44	7.52	9.24	12.97
r <= 1	16.37	17.85	19.96	24.6
r = 0	35.31	32.85	34.96	41.60

Source: Author's calculations

The short and long-run significant coefficients estimated from the VEC model are presented in Table 4. The basic cointegration equation is CAB = β1BB + β2EGR, where β1 and β2 are the regression coefficients that estimate the long-run relationship between the budget balance (BB) and economic growth rate (EGR) to the current account balance (CAB). The cointegration equation shows a negative long-run relationship of the budget balance to the current account balance. This finding is not consistent with the notion of the twin deficits hypothesis which asserts a positive relationship between the two variables. While it shows a positive long-run relationship of the economic growth rate to the account balance. This finding is important because it supports the assumptions that an increase in the country's economic growth rate is likely to affect two categories of firms: first, the category of firms that increase the production of domestic goods and contribute to the reduction of imports; second, the category of firms that increase the production of domestic goods mainly for exports. The long-run estimated coefficient implies that, on average, a 1% increase (decrease) in the budget balance attributes to a 0.47% decrease (increase) in the current account balance, *ceteris paribus*. While a 1% increase in the economic growth rate is estimated to increase the current account balance by 1.766% in Albania.

$$CAB = -0.4702422\ BB + 1.766247\ EGR \quad (13)$$

Table 4. Vector Error Correction Model (VECM)

	ECT	
Equation Current Account	-0.6236 (0.2189) **	
	Budget Balance -1	Economic Growth Rate -1
Equation Current Account	-0.2108 (0.8859) *	0.7415 (0.4076) *
Equation Budget Balance	-0.6717 (1.9315) **	
	Budget Balance -2	Economic Growth Rate -2
Equation Current Account	-0.1523 (0.0762) *	1.2032 (0.4091) **
Equation Budget Balance	-0.7193 (0.1587) ***	
	Budget Balance -3	Economic Growth Rate -3
Equation Current Account	-0.2182 (0.0506) ***	0.1694 (0.4162).
Equation Budget Balance	-0.6827 (0.1258) ***	

Source: Author's calculations

Finally, the statistically significant error correction term (ECT) of the current account implies that any distortion from the equilibrium in the previous lag is corrected at a rate of - 0.6236 % in the current period. In the short run lag 1, lag 2, and lag 3 of the budget balance variable are statistically significant meaning that there are delayed negative effects between present budget balance values and the previous period's budget balance values. This suggests that there is a short-run negative relationship within the budget balance variable. Similarly, the current account balance negatively affects the budget balance variable in the short run. This result presents for the Albania case study an inverse direction compared to the twin deficit hypothesis. Further, in the

short run, the results show a positive effect of the current account balance on the country's economic growth rate. This is important for the economy since the benefits of export growth or import reductions are translated into economic growth in Albania. To this extent, the government's policies might be focused on the context of the export industries, to stimulate the economic growth rates of the country.

The stability of the VEC model is tested using diagnostics tests of the VECM model as serial correlation: (Portmanteau Test), ARCH (multivariate), normality of residuals (JB-Test) is performed. To perform the test, the VECM model is transformed in the VAR model. The results of the Portmanteau test, in Table 5, show that there is no serial correlation between the variables (at 5% significance level). The ARCH (multivariate) test result with p = 1 shows that there is no arch effect, or there is no clustered volatility in the model, and the residuals are normally distributed.

Table 5. Diagnostics Tests

	Chi-squared	**df**	**p-value**
Portmanteau Test (asymptotic)	36.924	21	0.057294
ARCH (multivariate)	222	540	1
Normality of Residuals JB-Test	130	6	0.5734
Skewness only (multivariate)	21.927	3	0.35
Kurtosis only (multivariate)	108.17	3	0.6676

Source: Author's calculations

The results of the Granger causality test show that there are no Granger causalities, or instantaneous causalities between all the three-time series variables, at a 5% significance level.

Table 6. Pairwise Granger Causality Test results

Null Hypothesis	F-Test	Prob.	Type of Causation
CAB does not Granger cause BB	1.6785	0.1514	no causation
BB does not Granger cause CAB	2.2749	0.0549	
BB does not Granger cause EGR	1.3098	0.2682	no causation
EGR does not Granger cause BB	1.4671	0.2090	
CAB does not Granger cause EGR	0.9785	0.4325	no causation
EGR does not Granger cause CAB	2.0676	0.0787	

Source: Author's calculations

The impulse response function (IR) of the VEC model (obtained from its VAR transformation) shows the response of variables after positive shocks of the other variables. The plot of IR functions shows that all the variables' responses to aftershocks of the other variables show indecisive sort of relationships, which is a kind of reference from the Granger causality results (Appendix).

5. CONCLUSION

The relationship between government budget deficit and current account deficit has long been the center of empirical investigations, especially within the last decades when countries experienced large deficit imbalances. Research studies in this regard have been into consideration by policymakers as instruments to foster long-run growth strategies, most likely within less-developed nations. The analysis of the twin deficits seemed to be more appropriate for the developing economies with persistent deficits in their budget balances, not stable economic performance and in most cases with negative current account balances. Thus, it was the purpose of this study to empirically investigate the holding of the twin deficit hypothesis, for Albania case study.

The econometric results of the time series quarterly data in ratio to GDP, of the span period from 2008 to 2021, presented a negative long-run relationship between the budget balance to the current account balances. This evidence for Albania is not consistent with the twin deficits hypothesis of the Keynesian proposition, which supposes a positive relationship between the variables. The study results support the conclusion that efforts focused on improving the current account imbalances through fiscal policy might not be effective in the long run. Prudent government fiscal budget management may not prove to be a suitable policy instrument for the current account balance improvement. The pairwise Granger causality tests show that there are no causal associations or no instantaneous causalities between the concerned variables in the model. This is also confirmed by the variables' responses with no clear trends to aftershocks at the impulse response functions. The short-run results of the VEC model show a positive effect of the current account balance on the country's economic growth rate (differing from the Granger causality). This finding is important since the benefits of the current account balance growth are derived from export growth or import reductions, which are translated into economic growth in Albania. Based on the study findings it was recommended that the government's trade policies might be focused particularly in the context of industries specialized in producing the export goods in order to stimulate the economic growth rate of the country. Furthermore, the government should be more prudent in formulating facilitating fiscal policies for the industries that produce domestic goods that are mostly imported, thus contributing to the reduction of imports.

Data unavailability is the major limitation in this paper; a longer period span of time series data could be included in the econometric analyses generating more accurate results. Moreover, there are data constraints on some other variables that could potentially be added in the model. This might be a future scope of research of this study to be extended, which could provide improved insights on the possible policy implementations.

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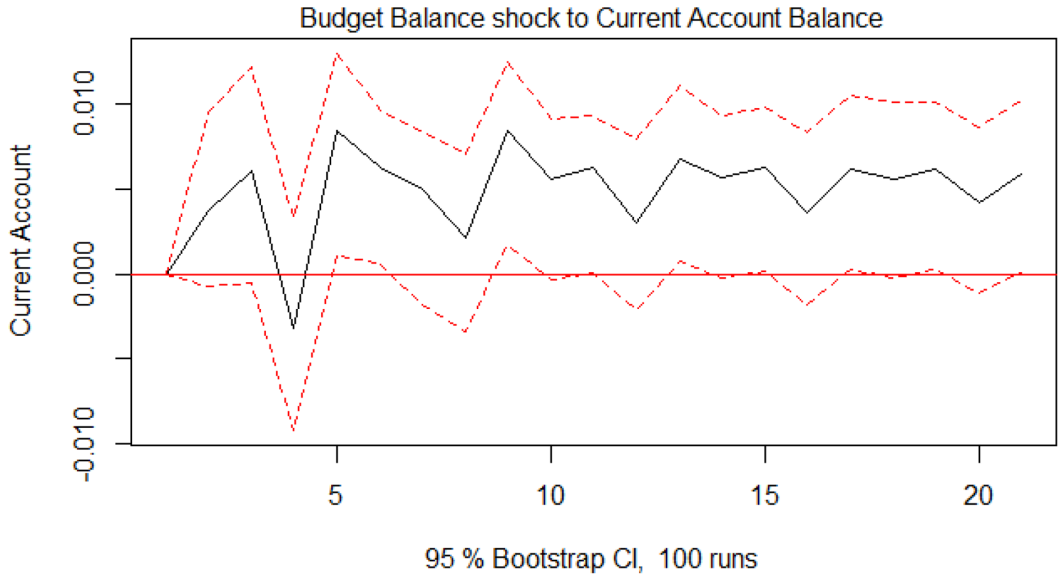
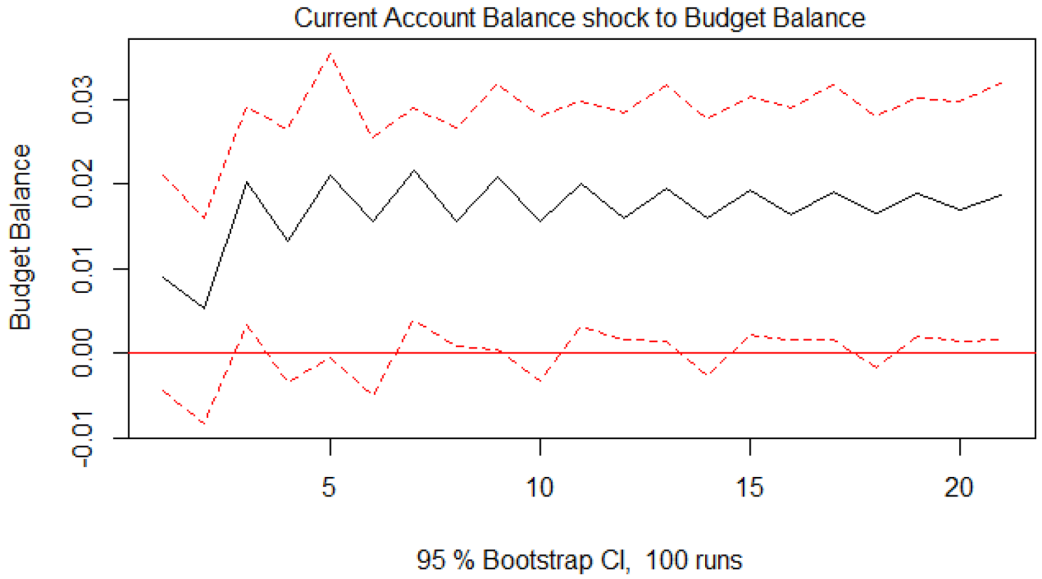
APPENDIX


Budget Balance shock to Current Account Balance
Current Account
0.010
0.000
-0.010
5
10
15
20
95 % Bootstrap CI, 100 runs


Current Account Balance shock to Budget Balance
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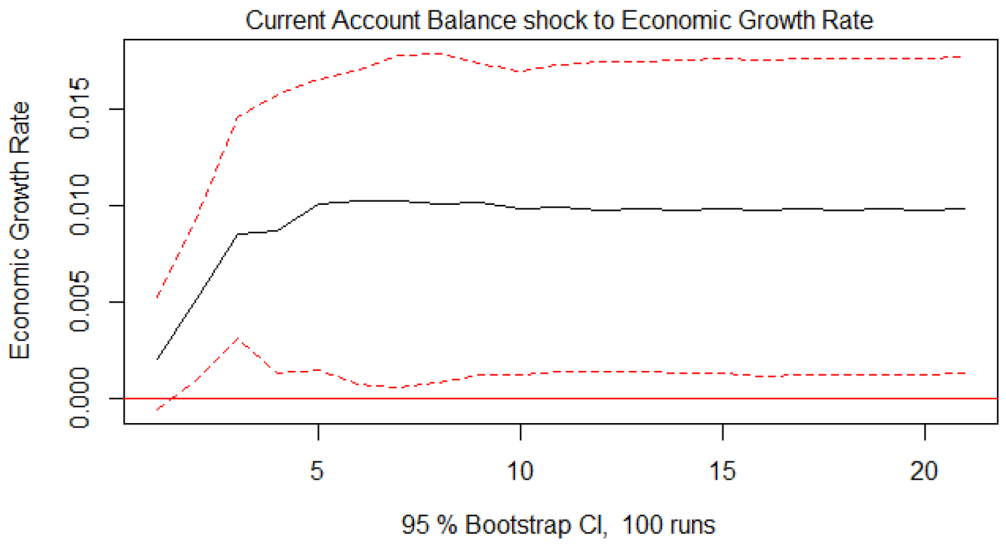
0.00
-0.01
5
10
15
20
95 % Bootstrap CI, 100 runs


Current Account Balance shock to Economic Growth Rate
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0.005
0.000
5
10
15
20
95 % Bootstrap CI, 100 runs

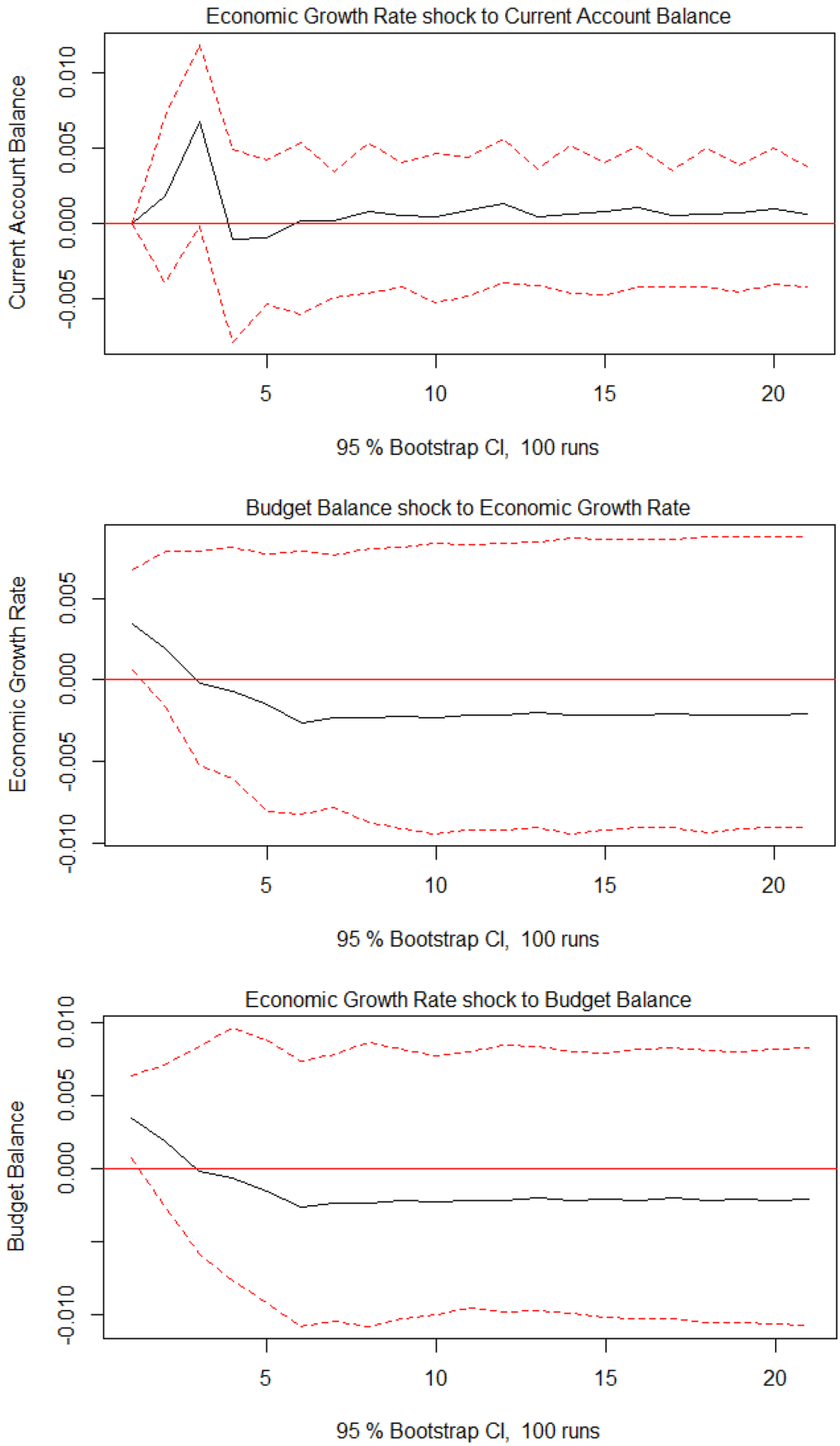

Figure 2. Impulse Response Functions Plots of the Budget Balance, Current Account Balance and Economic Growth Rate.

Source: Author's calculations

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Crude Oil Prices and the Chaotic Growth Model

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Chaos;
Elliot Waves

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Abstract: *The basic aims of this paper are: firstly, to create the simple chaotic crude oil prices growth model that is capable of generating stable equilibrium, cycles, or chaos; secondly, to discover a sequence of Elliot waves in crude oil prices movements in the period 1998-2015; and thirdly, to analyze the local stability of crude oil prices in the period 1998-2015. This paper confirms the existence of the convergent fluctuations of crude oil prices in the observed period.*

1. INTRODUCTION

Roncaglia A. (1983), Aguilera R. F., M. Radetzki, and L. Tekniska (2015) and Carollo (2012) explain the increasingly volatile oil market. Carollo (2012) proposes new models that are capable to explain the oil market and oil prices. It is important for energy market participants, commodity traders, investors, and government policymakers.

Hamilton D. J. (2008) examines the factors responsible for changes in crude oil prices. His paper reviews the statistical behavior of oil prices, relates these to the predictions of the theory. Topics discussed include the role of commodity speculation, OPEC, resource depletion, and key features of petroleum demand and supply.

McNally (2017) shows how oil price volatility prompted government policymakers to undertake extraordinary efforts to stabilize oil prices by controlling production.

Imsirovic (2021) writes about the international oil market. He explains a historical perspective on how the market emerged and developed. Throughout most of its 150-year history, the oil market has been monopolized by companies and governments. Market power is the key to understanding the 'price of oil'. Imsirovic (2021) explores how oil markets grew, and functioned.

Yoshino N. and V. Alekhina (2019) provide a theoretical and empirical examination of the impacts of oil supply and demand factors on Brent crude oil prices by developing an oil aggregate demand–aggregate supply model. They use the autoregressive approach and monthly time series data from 1999 to 2017.

Yoshino N. and V. Alekhina (2019) conclude that the oil demand side has affected oil prices more than the supply side. Namely, OECD and China have more of an impact on oil price change rather than oil suppliers such as OPEC, and the Russian Federation. Yoshino N. and V.

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Alekhina (2019) examine the equilibrium of the oil market during the estimated period and shows that oil prices were adjusted instantly, which confirms the existence of the equilibrium. The authors find that the appreciation of the US dollar has had a negative impact on oil prices.

Chaos theory started with Lorenz's (1963) discovery of complex dynamics arising from three nonlinear differential equations leading to turbulence in the weather system. Li and Yorke (1975) discovered that the simple logistic curve can exhibit very complex behavior. Further, May (1976) described chaos in population biology. Chaos theory has been applied in economics by Benhabib and Day (1981,1982), Day (1982, 1983), Grandmont (1985), Goodwin (1990), Medio (1993), Lorenz (1993), Jablanovic (2016).

2. THE MODEL

The chaotic crude oil price growth model is presented by the following equations:

$$D_t = \alpha - \beta P_t \qquad \alpha > 0, \beta > 0 \tag{1}$$

$$S_t = \gamma P_t \qquad \gamma > 0 \tag{2}$$

$$\frac{P_{t+1} - P_t}{P_t} = \mu(D_t - S_t) \qquad \mu > 0 \tag{3}$$

Where P_t – crude oil price ; S_t – supply function of crude oil; D_t – demand function for crude oil; μ - the adjustment coefficient; α, β – the coefficients of the crude oil demand function; γ – the coefficient of the crude oil supply function.

(1) defines demand function for crude oil; (2) defines supply function of crude oil; (3) determines the relation between crude oil price growth rate and surplus of demand for crude oil.

By substitution one derives:

$$P_{t+1} = (1+\mu\alpha)\, P_t - \mu(\beta+\gamma)\, P_t^2 \qquad \alpha, \beta, \mu, \gamma > 0 \tag{4}$$

Further, it is assumed that the current value of the crude oil price is restricted by its maximal value in its time series. This premise requires a modification of the growth law. Now, the crude oil price growth rate depends on the current size of the crude oil price, P, relative to its maximal size in its time series P^m. We introduce p as $p = P/P^m$. Thus s range between 0 and 1. Again we index p by t, i.e., write p_t to refer to the size at time steps t = 0,1,2,3, ... Now growth rate of the crude oil price is measured as:

$$p_{t+1} = (1+\mu\alpha)\, p_t - \mu(\beta+\gamma)\, p_t^2 \qquad \alpha, \beta, \mu, \gamma > 0 \tag{5}$$

This model given by equation (5) is called the logistic model. For most choices of α, β, γ and μ there is no explicit solution for (5). This is at the heart of the presence of chaos in deterministic feedback processes. Sensitive dependence on initial conditions is one of the central ingredients of what is called deterministic chaos.

The logistic map is often cited as an example of how complex, chaotic behavior can arise from very simple non-linear dynamical equations. The map was popularized by the biologist Robert

May (1976). The logistic model was originally introduced as a demographic model by Pierre François Verhulst.

It is possible to show that iteration process for the logistic equation

$$z_{t+1} = \pi\, z_t (1 - z_t) \qquad \pi \in [0, 4],\ z_t \in [0, 1] \tag{6}$$

is equivalent to the iteration of growth model (5) when we use the identification

$$z_t = \frac{\mu(\beta + \gamma)}{(1 + \mu\,\alpha)} p_t \text{ and } \pi = (1 + \mu\,\alpha) \tag{7}$$

Using (5.) and (7.) we obtain:

$$z_{t+1} = \frac{\mu(\beta + \gamma\ )}{(1 + \mu\alpha)} p_{t+1} = \frac{\mu(\beta + \gamma\ )}{(1 + \mu\alpha)} \{(1 + \mu\alpha)p_t - \mu(\beta + \gamma){p_t}^2\} =$$

$$= \mu(\beta + \gamma)p_t - \left[\frac{\mu^2(\beta + \gamma)^2}{(1 + \mu\alpha)}\right]{p_t}^2$$

On the other hand, using (6.) and (7.) we obtain:

$$z_{t+1} = \pi z_t(1 - z_t) = (1 + \mu\alpha)\left[\frac{\mu(\beta + \gamma)}{(1 + \mu\alpha)}\right]p_t \left\{1 - \left[\frac{\mu(\beta + \gamma)}{(1 + \mu\alpha)}\right]p_t\right\} =$$

$$= \mu(\beta + \gamma)p_t - \left[\frac{\mu^2(\beta + \gamma)^2}{(1 + \mu\alpha)}\right]{p_t}^2$$

Thus we have that iterating (5) is really the same as iterating (6) using (7). It is important because the dynamic properties of the logistic equation (6) have been widely analyzed (Li and Yorke (1975), May (1976)).

It is obtained that:

- For parameter values $0 < \pi < 1$ all solutions will converge to $z = 0$;
- For $1 < \pi < 3{,}57$ there exist fixed points the number of which depends on μ;
- For $1 < \pi < 2$ all solutions monotonically increase to $z = (\pi - 1) / \pi$;
- For $2 < \pi < 3$ fluctuations will converge to $z = (\pi - 1) / \pi$;
- For $3 < \pi < 4$ all solutions will continuously fluctuate;
- For $3{,}57 < \pi < 4$ the solution becomes "chaotic" which means that there exist totally aperiodic solution or periodic solutions with a very large, complicated period. This means that the path of z_t fluctuates in an apparently random fashion over time, not settling down into any regular pattern whatsoever.
- If $3 < \pi < 1+\sqrt{6}$ (approximately 3.45), z may oscillate between two values forever. These two values are dependent on π. In this case, we have a two-point attractor.
- if $3.45 < \pi < 3.54$, then z may oscillate between four values forever.
- If $3.54 < \pi < 3.57$ (approximately), then z will probably oscillate between 8 values, then 16, 32, etc.
- For $3{,}57 < \eta < 4$ the solution become "chaotic" which means that there exist totally aperiodic solution or periodic solutions with a very large, complicated period. This means

that the path of z_t fluctuates in an apparently random fashion over time, not settling down into any regular pattern whatsoever. For example, an increase or decrease in the fifth or sixth decimal place will have a drastically large effect. This is known as sensitivity to initial conditions. It means that a chaotic system, even one determined by a simple rule, is in principle unpredictable. It is unpredictable because in order to predict its behavior in the future we must know its current value *precisely*. Namely, a slight difference, in the decimal place, resulted in prediction failure. For $3{,}57 < \pi < 4$ the solution becomes "chaotic" which means that there exist totally aperiodic solutions or periodic solutions with a very large, complicated period. This means that the path of z_t fluctuates in an apparently random fashion over time, not settling down into any regular pattern whatsoever.

- If $\pi > 4$, then the values eventually leave the interval [0,1] and diverge for almost all initial values.

3. EMPIRICAL EVIDENCE

The main aim of this analysis is to present crude oil price growth stability in the period November 1998 - December 2015, by using the presented non-linear, logistic model (8).

In this sense,

$$p_{t+1} = \pi p_t - \upsilon p_t^2 \qquad \pi, \upsilon > 0 \tag{8}$$

where p - crude oil price, $\pi = (1+\mu\,\alpha)$ and $\upsilon = \mu\,(\beta + \gamma)$

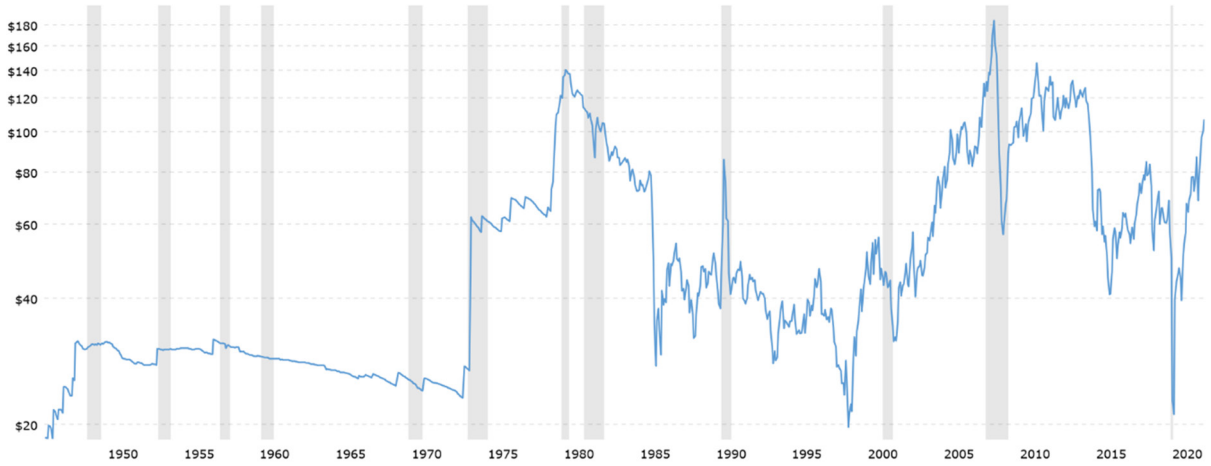

Figure 1. Interactive charts of West Texas Intermediate (WTI or NYMEX) crude oil prices per barrel back to 1946.[2]

Source: https://www.macrotrends.net/assets/php/chart_iframe_comp.php?id=1369&url=crude-oil-price-history-chart

It is supposed that the basic Elliott wave pattern exists from the period November 1998 - December 2015. This wave pattern consists of an impulse wave and a corrective wave. Impulse waves consist of 5 waves and move in the direction of the trend. Waves 1, 3, and 5 move in the direction of the trend, while Waves 2 and 4 move opposite to the trend. Corrective waves can be

[2] The price of oil shown is adjusted for inflation using the headline CPI and is shown by default on a logarithmic scale. The current month is updated on an hourly basis with today's latest value. The current price of WTI crude oil as of April 15, 2022 is **$106.95** per barrel.

simple or complex. A simple correction consists of 3 waves (Wave A, B and C) which retrace a portion of the impulse. The Elliot Wave Theory identifies (Frost A.J. & R.P. Prechter, 2006): (i) impulse waves that set up a pattern; and (ii) corrective waves that oppose the larger trend. The crude oil price movements are divided into: (i) trends (five waves in the direction of the main trend); and (ii) corrections (three corrective waves) (see Table 1).

Table 1. Crude Oil Prices for the period 1998-2015.

	Nov-1998	19.07
1	**Sep-2000**	49.50
2	**Nov-2001**	30.56
3	**Jun-2006**	101.58
4	**Jan-2007**	80.06
5	**Jun-2008**	178.36
A	**Jan-2009**	55.02
B	**Mar-2011**	133.19
C	**Dec-2015**	43.67

Source: https://www.macrotrends.net/assets/php/chart_iframe_comp.php?id=1369&url=crude-oil-price-history-chart

Firstly, we transform data on crude oil price from 0 to 1, according to our supposition that the actual value of crude oil price, P, is restricted by its highest value in the time series, P^m. Further, we obtain a time-series of $p = P / P^m$. Now, we estimate the model (8) (see Table 2).

Table 2. The estimated model (8): Crude Oil Prices, November 1998- December 2015.

R=0.333		
N=8	**π**	υ
Estimate	**2.328832**	2.106304
Std.Err.	0.602147	0.7556887
t(6)	3.867547	2.782851
p-level	0.008289	0.031877

Source: Own research

According to the logistic equation, for $2 < \pi < 3$ fluctuations converge to $z = (\pi-1)/\pi$, or (2.328832–1)/2.328832 = 0.5706. According to (7.), the equilibrium value of the crude oil price was 0.5706/(2.106304/2.328832), or 0.5706 / 0.9044 or 0.6309 in the observed period. Namely, the equilibrium value of the crude oil was 0.6309 x 178.36 = $ 112.5273 per barrel in the observed period.

4. CONCLUSION

This paper creates the chaotic crude oil price, growth model. The model (5) has to rely on specified parameters α, β, γ μ and initial value of the crude oil price, p_0 . But even slight deviations from the values of parameters: α, β, γ, μ and initial value of the crude oil price, p_0 , show the difficulty of predicting a long-term crude oil price movements.

A key hypothesis of this work is based on the idea that the coefficient $\pi = (1+\mu\ \alpha)$ plays a crucial role in explaining the local stability of the crude oil price, where, μ is the adjustment coefficient; α is the coefficient of the crude oil demand function. The estimated value of the coefficient π is 2. 328832 This result confirms continuous fluctuations of the crude oil price in the observed period. The equilibrium crude oil price was= $ 112.5273 per barrel.

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International Trade of Agricultural Products in Disruptive Times – The Correlation between Exports Subjects

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Keywords:
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Abstract: *International trade helps reduce food insecurity by connecting the regions with limited agricultural potential and large populations to the regions with comparative advantages in agriculture. The international trade of agricultural products appeared to be vitally important in times of such challenges of nowadays as the COVID-19 pandemic, climate changes, turbulences on the political scene, etc., which the whole humanity has to face and overcome. The purpose of the article is to assess if the exports of the agricultural products from Ukraine to the EU and from Canada to the EU are correlated and, if they are, how strong the correlation is. The data under analysis are the export amount of goods from the Standard International Trade Classification (SITC) groups 0, which comprises food and live animals, and 1, which contains beverages and tobacco. The timeframe under analysis is 10 years – from 2011 to 2020 included. Such simple statistics of the data sets under analysis as mean, standard deviation, sum as well as minimum and maximum values were calculated and compared. The dynamics, yearly changes and general trend lines of the data sets under research were analysed and compared. The general trend lines of the data under analysis were built and the projections for the following two periods were made in the article using the appropriate functions, having chosen from the exponential, linear, logarithmic, polynomial and power ones, taking into consideration the values of R^2 coefficients. The analyses for the data normality distributions were conducted. The Pearson and Spearman correlation coefficients as well as their p-values of the data researched were calculated and analysed. The research itself as well as its results would be interesting and useful for the public administration officials, business people, decision-makers as well as beginners and experienced specialists in data analysis and statistics.*

1. INTRODUCTION

People have traded since times immemorial, being more precise – for about five thousand years. Besides goods exchange, trade was also a boon for human interaction, bringing cross-cultural contact to a whole new level (Whipps, 2008). That is the development of trade was an absolute necessity for the further development of human civilization. The need for trading exists due to the variations in availability of resources and comparative advantages (Prachi Juneja, n.d.), as well as in the possibility to decrease the said variations with its help.

But, before proceeding with the peculiarities, advantages, etc., of trade, let's remember what the notion of "trade" means. So, trade is a basic economic concept involving the buying and selling of goods and services, with compensation paid by a buyer to a seller, or the exchange of goods or services between parties (Heyes, 2021). It's a matter of common knowledge that trade is very important all in all, but the challenges to meet growing global food demand include population and income growth and supply uncertainties complicated by a changing climate, environmental pressures and water scarcity point to the increasing importance of trade (Glauber, 2020).

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The importance of the local trade, that is the trade between the subjects within the defined territory/borders, shouldn't be underestimated, but the vital significance of the international trade should be paid special attention to as the international trade allows individuals and businesses to take advantage of lower prices and increased choice of goods and services (The Heritage Foundation, n.d.). Besides all the advantages of international trade, it also helps create new jobs in the trading partner countries, helping decrease the unemployment rate and increasing the living standards. Though many researchers and practitioners write about the extreme importance of exports, because of their ability to "earn" foreign currency, increase the budgets inflow, etc., it should be stated, that imports are not less important at all, as they give people access to a wider assortment of goods and services at lower prices. One of the most important features of international trade is that it helps reduce food insecurity by connecting the regions with limited agricultural potential and large populations to the regions with comparative advantages in agriculture (Bouët & Laborde, 2017).

Agriculture remains one of the strategically important sectors of the world economy as it provides food security and many raw materials for the other related industries (Khitakhunov, n.d.). Traditionally, societies and their governments have pursued agricultural development to ensure adequate food is available and affordable (Anderson & Martin, n.d.). For countries that have a competitive agricultural sector, the expansion of international trade in agricultural commodities can have a growth-enhancing effect and improve their trade balance (De Schutter, 2009). Agricultural product trade helps to answer possible food production shortages due to climatic or other reasons (European Commission, n.d.). Long-distance trade has contributed to agricultural development and global economic growth for millennia (Anderson & Martin, n.d.).

The international trade of agricultural products appeared to be vitally important in times of such challenges of nowadays as the COVID-19 pandemic, climate changes, turbulences on the political scene, etc., which the whole humanity has to face and overcome.

Taking into account everything stated above, the article aims to answer the scientific question of whether the exports of the agricultural products from Ukraine to the EU and from Canada to the EU are correlated and, if they are, how strong the correlation is.

2. MATERIALS AND METHODS

The dynamic development of the agricultural markets requires them to be permanently monitored and prospectively analysed (European Commission, n.d.) as a deep and precise analysis both gives us the overview of the present state of matters in the definite sphere and allows us make the most accurate projections to be ready for the eventual future options and react on them at the quickest and best way possible.

The data analysed are the agricultural products exports of Ukraine and Canada to the EU. The EU means EU27, that is the European Union comprising 27 member states. The data under analysis are the export amount of goods from the Standard International Trade Classification (SITC) groups 0, which comprises food and live animals, and 1, which contains beverages and tobacco. The timeframe under analysis is 10 years – from 2011 to 2020 included. Such simple statistics of the data sets under analysis as mean, standard deviation, and sum as well as minimum and maximum values were calculated and compared to get more in-depth knowledge about the subjects under analysis. The dynamics and general trend lines of the data sets under

research were analysed and compared. The general trend lines of the data under analysis were built and the projections for the following two periods were made in the article using the appropriate functions, having chosen from the exponential, linear, logarithmic, polynomial and power ones, taking into consideration the values of R^2 coefficients. The analyses for the data normality distributions were conducted to be used in further research. The Pearson and Spearman correlation coefficients as well as their corresponding *p*-values of the data researched were calculated and analysed to make the conclusions about the presence/absence of the correlation between the researched data, the strength of the correlation in case of its presence and the statistical significance of the obtained results.

The research itself as well as its results would be interesting and useful for the public administration officials, business people, decision-makers as well as beginners and experienced specialists in data analysis and statistics.

3. RESULTS

Ukraine, located in Eastern Europe, is the second-largest country on the said continent. It is situated at the crossroads of Europe and Asia. The geographical location, weather conditions, fertile lands and availability of a skilled and affordable workforce make Ukraine a prominent agricultural producer and exporter. Of Ukraine's total land area of 60 million hectares, roughly 42 million is classified as agricultural land, which includes cultivated land (grains, technical crops, forages, potatoes and vegetables, and fallow), gardens, orchards, vineyards, and permanent meadows and pastures (World Data Center, n.d.). Ukraine is among the leading producers and exporters of such agricultural crops as sunflower seeds and oil, wheat, barley, soybeans, and corn. Due to the horrible events taking place in Ukraine, the country is much spoken about nowadays. The changes in the geopolitical situation of the country are very important, especially for the European neighbours having common borders with Ukraine. But, what is vitally important not only for Europe but for the whole world as well, is the role of the big agricultural producer and exporter Ukraine plays nowadays and the impact of the changes in the geopolitical state of the country on the global food security situation. The trade relations of Ukraine with the European Union (the EU) are regulated by the Association Agreement, including a Deep and Comprehensive Free Trade Area (DCFTA), which was negotiated between 2007 and 2011 and signed on 21 March and 27 June 2014 (European Commission, 2021(b). The EU is Ukraine's largest trading partner, accounting for more than 40% of its trade in 2019. Ukraine is the 18th trading partner of the EU accounting for around 1.1% of the EU's total trade (European Commission, 2021(b).

Canada, situated in North America, extends from the Atlantic to the Pacific Ocean and is the world's second-largest country in terms of total territory. Though only about 7 per cent of Canada's land can be farmed, agriculture is an important industry in Canada (Hein, 2021).

Among Canada's top agricultural products are canola, cattle and calves, beef and veal, vegetables and poultry (Hein, 2021). The trade relations of Canada with the EU are regulated by the EU-Canada Comprehensive Economic and Trade Agreement (CETA), which provisionally entered into force on the 21st of September 2017 (European Commission, 2021(a). In 2020, Canada was the tenth largest partner for EU goods exports and the 16th largest partner for EU goods imports (European Commission, 2021(a). To have the fullest possible picture of the data under research, let's compare the agricultural products exports of Ukraine and Canada to the EU dynamics (Figure 1).

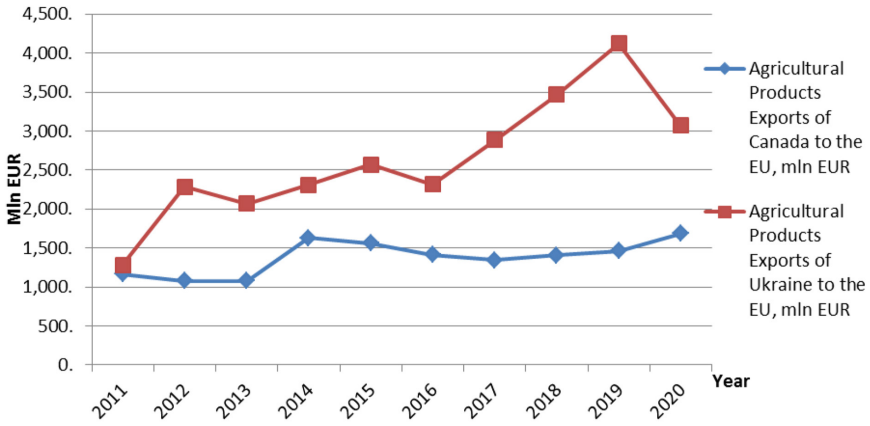

Figure 1. Agricultural Products Exports of Ukraine and Canada to the EU, mln EUR
Source: author's own elaboration on the basis of the data from (Eurostat, 2022).

Taking into account everything mentioned above concerning the geo-economic characteristics of the countries under research, the agricultural products exports dynamics depicted in Figure 1 seem to be even more interesting to be analysed. On the one hand, the countries under research are difficult to be compared in terms of their territories (Canada is approximately 16.5 times bigger than Ukraine), but, at the same time, the agricultural products exports amount of each of the countries were very much alike in 2011, that is at the beginning of the timeframe under analysis. In 2012 the difference between the said amounts doubled but not according to the territories difference, just on the contrary, that is the agricultural products exports of Ukraine were two times bigger than those of Canada. In general, the agro – exports dynamics of Ukraine to the EU are more changeable with sharp positive peaks in 2012 and 2019 and a negative change – in 2020. By the way, the changes in the exports of the agricultural products in 2020 are an interesting thing to be paid special attention to, that is they are completely different either according to the direction or the difference. That means, the agro – exports of Ukraine to the EU decreased by 1049.5 mln EUR (being the biggest decrease of the said exports during the timeframe under analysis) while the said exports of Canada to the EU increased by 221.5 mln EUR. Such a negative change of the agro – exports amount of Ukraine can be explained by the negative impact the COVID-19 made on all the activity spheres, but the increase of the agro – exports amount of Canada, that occurred in the same year, is hard to be explained. To further deepen the analysis, let's compare the simple statistics of the agricultural products exports of Ukraine and Canada to the EU (Table 1).

Table 1. Simple Statistics of the Agricultural Products Exports of Ukraine and Canada to the EU

Variable	N	Mean	Standard Deviation	Sum	Minimum	Maximum
Agricultural Products Exports of Ukraine to the EU, mln EUR	10	2639	791.96216	26391	1285	4123
Agricultural Products Exports of Canada to the EU, mln EUR	10	1383	217.67292	13833	1077	1686

Source: author's own elaboration on the basis of the data from (Eurostat, 2022).

To better understand the data presented in the table given above, it should be mentioned, that "N" denotes the number of observations, "Sum" – the sum of the values, "Minimum" – the minimum value and "Maximum" – the maximum value. Getting to the essence of the comparative

analysis, it should be stated, that the mean for the agricultural products exports of Ukraine to the EU is almost two times bigger than that of Canada. The same result we have having compared the sum of the variables from the data sets under research. The difference is absolutely smaller when we compare the minimum values of the analysed data sets, that is the minimum value of the Ukrainian agro–exports to the EU is only 1.2 times bigger than that of the Canadian one. While the maximum value of the agro – exports from Ukraine to the EU is almost 2.5 times bigger than that of Canada. The difference between the simple statistics items becomes much bigger, when we compare the standard deviations of the data in the analysed data sets – the standard deviation of the agro – exports of Ukraine to the EU is approximately 3.4 times bigger than that of the Canadian agro–exports, meaning – the data in the agro – exports of Ukraine to the EU data set are 3.6 times more dispersed than those of the said Canadian exports. The next step of the research will be the building of the general trend line for the agricultural products exports of Ukraine to the EU with the attempt to make a projection of the said exports amount for the following two periods, that is for two years (Figure 2).

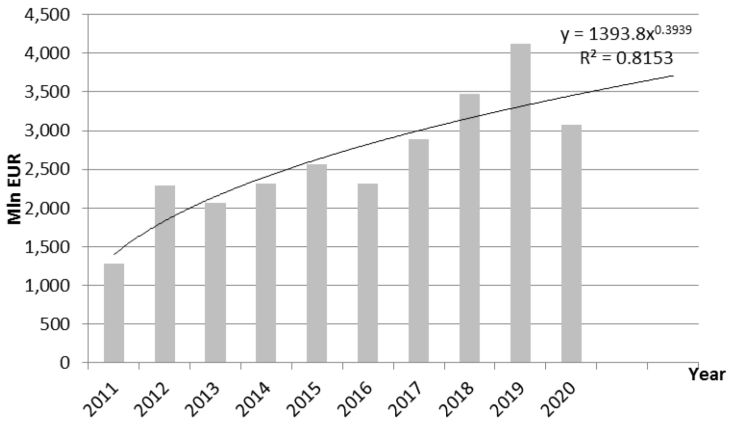

Figure 2. Agricultural Products Exports of Ukraine to the EU, mln EUR
Source: author's own elaboration on the basis of the data from (Eurostat, 2022).

Though the data depicted in Figure 2 are rather changeable, the general trend line is upward through the whole timeframe under analysis as well as through the following two periods taken for the projection making. The trend line was built using the power function, having chosen from the exponential, linear, logarithmic, polynomial and power ones. The criterion for the choice of the appropriate function was the values of the R^2 coefficients. Let's have a more precise look at two years taken for the projection making – though, as it has been previously mentioned, the general trend line is upward and the projections for the following two years is the agro – exports increase, the agro – exports amount will not "approach" the level of the year 2019, under the circumstances unchanged. To compare the agricultural product exports of Canada to the EU with those of Ukraine, analysed earlier, let's visualise the said Canadian exports in Figure 3.

Despite the fact, that the agricultural products exports of Canada to the EU are not as changeable as those of Ukraine, the trend line for both export dynamics was built using the same function type, that is the power one. The list of the functions, as well as the criterion for the right choice, is the same as in the case with the Ukrainian agro – exports. Though the general trend line is also upward through the whole timeframe under research, the upward slope is not so steep as in the case with the Ukrainian agro – exports. Another interesting matter to pay one's attention to – despite the upward trend line of the agro – exports of Canada to the EU, the projection for the following two years are supposed to be lower than the value of the year 2020,

under the circumstances unchanged. Having conducted the multi-level comparative analysis, the main purpose of the article is to be fulfilled, that is – it's time to assess whether the agricultural products exports of Ukraine to the EU are correlated with the said exports of Canada to the EU, and if they are, how strong the correlation is. The first step in the assessment mentioned above is the calculation of the Pearson correlation coefficients and their corresponding *p*-values. The results of the mentioned calculations are presented in Table 2.

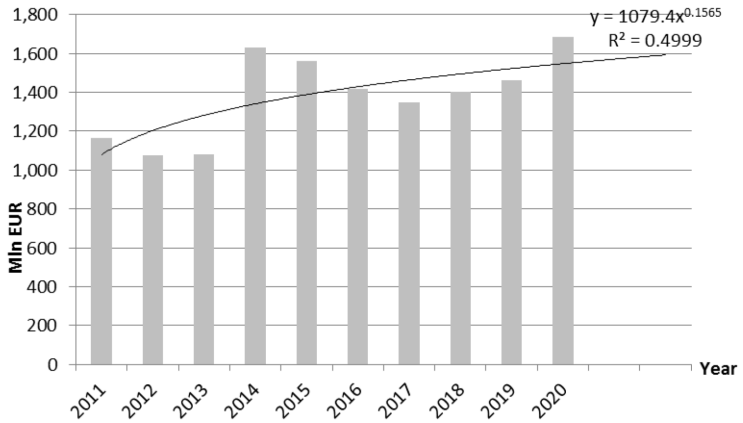

Figure 3. Agricultural Products Exports of Canada to the EU, mln EUR

Source: author's own elaboration on the basis of the data from (Eurostat, 2022).

Let's, first of all, analyse the very values of the Pearson correlation coefficients of the agricultural products exports of Ukraine and Canada to the EU. The value of the Pearson correlation coefficient of the agricultural products exports of Ukraine to the EU and Canada to the EU points to a positive moderate correlation between the analysed subjects. With the 95% of confidence intervals, that is with α=0.05, the corresponding *p*-values indicate the obtained results not to be statistically significant and don't allow us to reject the H0. As the Pearson correlation test needs the data analysed to be normally distributed, the tests for normality were conducted with the data under research. To cut the long story short, the agro – exports of Ukraine to the EU data appeared to be a little bit rightly skewed and leptokurtic, while the said exports of Canada to the EU data – were a little bit negatively skewed and platykurtic. Though the deviations from normality are rather small, they still exist and should not be allowed to influence the conducted research about the presence/absence of the correlation between the analysed subjects. That's why the Spearman correlation coefficients and their corresponding p-values were calculated and presented in Table 3.

Table 2. Pearson Correlation Coefficients of the Agricultural Products Exports of Ukraine and Canada to the EU

	Agricultural Products Exports of Canada to the EU, mln EUR	Agricultural Products Exports of Ukraine to the EU, mln EUR
Agricultural Products Exports of Canada to the EU, mln EUR	1.00000	0.47263 0.1678
Agricultural Products Exports of Ukraine to the EU, mln EUR	0.47263 0.1678	1.00000

Pearson Correlation Coefficients, N = 10 Prob > |r| under H0: Rho=0

Source: author's own elaboration on the basis of the data from (Eurostat, 2022).

As Spearman correlation is a non-parametric test, having no dependence on whether the data are normally distributed, the Spearman correlation coefficients are considered to be more robust for the data with deviations from normality. First of all, let's take a look at the value of the

Spearman correlation coefficient between the agricultural products exports of Ukraine to the EU and Canada to the EU. Its value points to the presence of a positive moderate correlation between the subjects under analysis. But, when we cast a look at its corresponding p-value, we see, that its value points to the fact, that the said coefficient result can't be considered statistically significant, not allowing us to reject the H0 hypothesis.

Table 3. Spearman Correlation Coefficients of the Agricultural Products Exports of Ukraine and Canada to the EU

	Agricultural Products Exports of Canada to the EU, mln EUR	**Agricultural Products Exports of Ukraine to the EU, mln EUR**
Agricultural Products Exports of Canada to the EU, mln EUR	1.00000	0.53939 0.1076
Agricultural Products Exports of Ukraine to the EU, mln EUR	0.53939 0.1076	1.00000

Spearman Correlation Coefficients, N = 10 Prob > |r| under H0: Rho=0

Source: author's own elaboration on the basis of the data from (Eurostat, 2022).

4. CONCLUSION

Humanity is facing many challenges nowadays. They seem to be more or less seriously dependent on their nature, causes and consequences. But all of them have a common thing – they all threaten food security directly or indirectly. But, when the impact of such challenges as climate changes seem to be obvious because of their direct influence on the food security through their impact on the agricultural production, many don't consider the turbulences on the political scenes, especially those in the small countries, to seriously impact the global food security directly. The horrible events happening in Ukraine showed everybody, that, even if a country is relatively small, it can still be an important player on the global agricultural market and any political turbulences on its scene can impact its agricultural production and, therefore, its agricultural exports, impacting then directly the food security either of its trading partners or the whole world as well.

To make conclusions from the conducted research, it should be reminded, that the EU is the first trader in agricultural products of the world, both in terms of exports and imports (European Commission, n.d.). So, the trade relations with such a powerful player in the global market are interesting and useful to be researched. Though Canada is approximately 16.5 times bigger than Ukraine, the agricultural products export amount of each of the countries was very much alike in 2011, with the difference between the said amounts having been doubled in 2012 in favour of Ukraine. In general, the agro – exports dynamics of Ukraine to the EU are more changeable than that of Canada. What is worth paying special attention to, is the change in the agricultural products exports of Ukraine and Canada to the EU in 2020 – in the case of Ukraine the said exports decreased by 1049.5 mln EUR, while the analysed exports of Canada to the EU increased by 221.5 mln EUR.

The simple statistics of the Ukrainian agro–exports to the EU for the timeframe under analysis, except for standard deviation, are approximately two times bigger than those of Canada.

The difference between the standard deviations of the analysed data sets is 3.4 times in favour of the Ukrainian exports, proving once more the higher dispersion of the Ukrainian agro – exports data values if compared to those of Canada. Though, the general dynamics of the agricultural

products exports of Ukraine and Canada to the EU differ, the trend lines for both agro - exports data under research were built using the same function type, that is the power one. In both cases, the power functions for the building of the trend lines and projection making were chosen from the exponential, linear, logarithmic, polynomial and power functions. The criterion for the appropriate function choice was the values of the R^2 coefficients. The trend lines are upward in both cases, though the one of the Ukrainian exports is steeper than that of the Canadian one. According to the projections, the agricultural products exports amount of Ukraine to the EU is to be higher, than that of 2020, though lower, than that of 2019, under the circumstances unchanged. The projected agricultural product exports of Canada to the EU are to be lower than that of 2020, under the circumstances unchanged. The value of the Pearson correlation coefficient of the agricultural products exports of Ukraine to the EU and Canada to the EU points to the positive moderate correlation between the analysed subjects. With the 95% of confidence intervals, that is with $\alpha=0.05$, the corresponding p-values indicate the obtained results not to be statistically significant and don't allow us to reject the H0. Similar results were obtained after the Spearman correlation coefficients and their corresponding *p*-values were calculated.

So, in order to keep pace with demographics and the growing demand for affordable, safe and nutritious food, policymakers will need to develop strategies that promote economically, socially and environmentally sustainable agriculture and agri-food systems (WTO, 2019). Talking about strategies, not only economical ones should be developed and implemented, but the ones promoting stabilization of the overall political situation in the world as well as in single countries are to be paid the special attention to as the slightest turbulences even in the smallest country can appear to threaten the food security of either its trading partners or the whole world.

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How Has SARS-COV-2 Affected the Different Branches of Agri-Food Industry? A Study Focused on the Region of Extremadura

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Abstract: *The pandemic caused by Covid-19 has been causing a great impact on the world economy since 2020. This study analyses the impact of the pandemic on innovative agri-food companies from different branches of agro-industrial activity located in Extremadura (Spain) to determine which activities have been most affected and whether there are differences between the actions and changes carried out depending on the nature of the product, process or services. The information was obtained using an online questionnaire in which the research questions were proposed (what consequences, actions or changes has the pandemic had on the development of your activities?). Data were analysed descriptively, studying statistically the existence of independence or not between the effects and the actions carried out depending on agri-food industry branches of activity. The main results have shown that in general, all the agro-industrial branches have incorporated changes in their products and services, mainly by providing new and better customer benefits and improving product formats and forms of payment to suppliers.*

1. INTRODUCTION

Globally, the coronavirus pandemic has become a health threat and is causing an unprecedented economic impact on the global economy (Donthu & Gustafsson, 2020).

The coronavirus has affected all areas, regions and sectors of activity. In the case of the food and beverage manufacturing sector, food production and consumption patterns have been disrupted (Eftimov et al., 2020). The challenges facing this sector involve operations, security, the supply chain, training, emergency response, awareness, incident management, a recreation of business models, digitisation and other impacts not previously considered (Vázquez-Martínez et al., 2021). As is happening worldwide, the pandemic has also brought about a change in food consumption patterns in Spanish households. The main changes in consumption trends during the first confinement in Spain (mid-March to mid-May 2020) were: the purchase of healthier foods, less spending on foods of low nutritional interest, and increased cooking at home. Similarly, other reports and studies also reveal that during the lockdown, there was a 50% increase in spending in supermarkets and large food outlets (Pérez-Rodrigo et al., 2020). There was also a 60% increase in the use of online commerce for food purchases, thus avoiding movement, travel and contact among people. In addition, spending on restaurants was reduced by 90% (CaixaBank Research, 2020).

Regarding the type of food and its consumption, in accordance with the report published by the Ministry of Agriculture, Fisheries and Food (MAPA) on May 15, 2020, in relation to data from the consumption panel relating to the purchase volume of Spanish households during March,

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a greater presence of meat, vegetables, legumes, rice and dairy products was observed in the shopping basket, as well as a greater demand for fish products (Ministerio de Agricultura Pesca y Alimentación, 2020b).

In Extremadura, the Spanish region on which this study focuses, the agri-food sector is strategic for promoting the economic and territorial development of the region. In fact, the weight of the agricultural sector and its associated industries is notably higher than the national average. According to data from the Spanish National Institute of Statistics (Instituto Nacional de Estadística, 2021), in 2020 there were 1,382 companies associated with the food, beverage and tobacco industries, which represents 2.07% of the total in the Extremadura region. Agri-food organisations have a weight in the total number of industries in the country of 0.89%, representing Extremadura more than twice that at the national level.

However, despite its relevance in regional economic development, Extremadura's agribusiness suffers from chronic problems derived from a lack of business clusters, small size and local nature, or marginally innovation activities (Corchuelo & Mesías, 2017). Thus, the agri-food industry is undergoing substantial changes as it sees the need to include innovation in its strategies and to change its products. Innovation (technological and non-technological) provides agri-food companies with the opportunity of generating higher income and increasing their productivity and competitiveness, which is especially relevant in crisis situations (Corchuelo & Martín-Vegas, 2018).

The main objective of the study is to analyse the impact, consequences, and implications of the pandemic on innovative agro-industries in different branches of activity to determine which activities have been most affected and whether there are differences between the actions and changes carried out depending on the nature of the product, process or services. To achieve this objective, we analyse the firm's answers to the following research questions: What consequences has the pandemic had on the development of your activities?; What actions have you taken to deal with the consequences of the pandemic of COVID-19?; What changes have you been obliged to make as a result of the pandemic in terms of product, services, brand, product format or consumer behaviour?

Our research fills this gap by providing an overview of the consequences, implications and actions taken by innovative agri-food industries in Extremadura according to a branch of activity. Furthermore, the results of the present research intend to make a useful contribution to the existing literature on the impact of the pandemic on the agricultural sector, especially in the Extremadura region. Likewise, the findings may be beneficial for senior executives of the Extremadura agri-food companies and the public administration of the region, providing information for the development of initiatives that mitigate the negative effects of the pandemic and favour the implementation of actions that help the adaptation of agro-industrial activities.

2. MATERIALS AND METHODS

The data analysed come from crossing and analysing various databases on agri-food companies in Extremadura (Spanish National Institute of Statistics, Agri-food Cooperatives of Extremadura, and Iberian Balance Sheet Analysis System) belonging to the sectors of the National Classification of Economic Activities (NCEA) code 10 (Agrifood Industry), 11 (Beverages) and 12 (Tobacco). Finally, the report/directory contains information on 734 companies, of which innovative agri-food companies (283 companies) were selected as the study population.

To obtain information about the research, a questionnaire was designed based on the results of previous research (Corchuelo et al., 2021). The questionnaire includes questions on the characteristics of the companies and the informant, questions related to the impacts as they affect the financial performance and operational performance, the new actions incorporated by the industries into their processes and in their procedures to deal with the consequence effects of the coronavirus.

Finally, 150 responses were obtained (53% of all innovative agribusinesses). The sample obtained is representative of the population (confidence level of 95% and a margin of error of 5%) and the data were analysed descriptively, analysing the frequency of responses in the different aspects questioned according to branches of activity. From a statistical point of view and considering the frequencies observed for each question, the Pearson chi-square test applied to the study of two variables (contingency tables) was used.

3. RESULTS

Generally, and coinciding with the study by Vázquez-Martínez et al. (2021), the challenge and changing scenarios caused by the pandemic mean that organisations belonging to the food sector are facing impacts not previously considered. However, it can be seen that all companies, regardless of their branches of activity, carried out actions and procedures as a result of the negative impacts they suffered.

3.1. Negative Consequences of the Pandemic in the Development of Agribusiness Activities (Financial and Operational Functions)

Extremaduran agri-food industries perceive the decrease in their turnover as the greatest negative consequence of the pandemic affecting their financial function, as has been shown in other reports (Federación Española de Industrias de alimentación y Bebidas-FIAB, 2019). This negative consequence is reported in more than 50% of all companies in all branches of activity. In addition, more than 85% of all branches of the tobacco industry and the manufacture of beverages have seen their turnover particularly affected. In the case of the Tobacco Industry, as reported in other reports, the monthly tobacco sales from March 2020 began to fall by 23.8% % fewer sales in April compared to the same month in 2019. Unlike other sectors, tobacconists remained open during the March and April confinement. However, the restrictions associated with other activities, such as tourism, catering or nightlife, have also had an impact on the tobacco sector, as leisure and social time has been reduced, and tourism has an influence on many sectors (García, 2021). Regarding beverage manufacturing, 100% of the companies are wine and beer (alcoholic beverages) manufacturers and have seen their turnover decrease, as indicated by 85.7% of the total. The decline in turnover has occurred despite the fact that alcohol continued to be available at all times, although this trend seems to confirm the importance of the social consumption of alcoholic beverages. The overall drop in drinking did not prevent a likely increase of alcohol ingested at home, as during the months of confinement a large increase in the purchase of products usually consumed in bars and restaurants, such as wine, beer and spirits, was observed, although not in the same volume (Villanueva et al., 2021).

Industries have also been affected by the shift in demand for products. There has been a decrease in the demand for some food products as a result of the restrictions and measures adopted by governments to deal with the pandemic. As indicated in the study by (Pérez-Rodrigo et al., 2020), the pandemic is generating changes in food consumption patterns. Thus, since the first confinement was

decreed in Spain until the "new normality" (March 14-June 21), food consumption trends were oriented towards the consumption of healthier, fresh and nutritionally rich products (Bona et al., 2020). Consequently, the branches of activity that have been most affected are meat and beverage manufacturing. In line with the study by Sinisterra-Loaiza et al. (2020), this trend can be explained by the fact that most of the meat companies in the sample not only work with fresh meats but also manufacture sausages and cold cuts, which could be perceived by consumers as less healthy products.

Moreover, the Manufacture of beverages branch of activity is also experiencing a notable shift in demand for its products. In the case of sparkling wines, the decline in sales and the shift to other types of wines, such as still wines, is basically due to the fact that the sparkling wine category is closely associated with celebratory occasions, although producers are increasingly making great marketing and communication efforts to change this perception of the moment of consumption (Bharadwaj et al., 2020).

On the other hand, companies perceive a decrease in the investment budget (36% of the total) and a slowdown in R&D projects (29.3% of the total) as minor negative consequences affecting their financial function.

Concerning the negative consequences affecting the operational function of the industries, these have had an effect mainly on their marketing activities (56.7% of the total). In general, as has happened worldwide, the agri-food industries in Extremadura have experienced difficulties in carrying out trade activities due to the virus containment measures. The physical closing of international borders has had a negative impact on the freedom of exchange of goods, although the flexibilization and relaxation measures of governments, together with the resilience of companies, have contributed to softening this negative trend (Makhiboroda et al., 2020).

However, other measures adopted to control the virus, such as the closure of catering establishments or the limitation of opening hours, have been extended over time depending on the speed and characteristics of the propagation of the pandemic. This has caused changes in food marketing channels (Bolívar et al., 2021). Specifically, the most adversely affected channel has been the HORECA channel (hotels, restaurants and cafeterias) (Caldart et al., 2021).

Industries in the food and beverage sector have also been adversely affected operationally because of the reduced availability of personnel due to sick leave caused by coronavirus infection (Food and Agriculture Organization of the United Nations, 2020). In addition, labour shortages have contributed in part to the occasional decline in activity in some production centres. According to the study by Corchuelo et al. (2021), this negative effect is enhanced in agroindustrial branches that concentrate their activity on seasonal work campaigns due to the characteristics of their products, as is the case of fruits and vegetables. Thus, the large food processing industries have been forced to introduce staggered entries to work centres, thus reducing interpersonal contact at specific times of peak activity. Finally, the results reveal that the lack of supplies from suppliers has also affected the operational functioning of the companies (20% of the total), although to a lesser extent.

3.2. Actions in Processes and Procedures Developed to Deal with the Consequences of the Pandemic of COVID-19

In response, industries belonging to the food sector have incorporated and continue to include actions in their activities to minimise the negative effects caused by the pandemic (Food and Agriculture

Organization of the United Nations, 2020). First, with respect to the changes, they implement in their processes and as shown by other previous studies and reports, the pandemic has accelerated the trend towards a digital economy (Calza et al., 2022). In general, the agri-food industries, as far as possible, have incorporated teleworking in some areas of work not related to production, such as administration, thus allowing them to continue with their activities. The food sector has also used new channels to relate to the market, such as the use of virtual communication and purchasing platforms, an action which industries belonging to the Beverage Processing branch have highlighted above the rest (CaixaBank Research, 2020). The results show, however, that the search for and design of new products is less frequently mentioned by the companies as an action carried out in the processes.

Secondly, the industries of the food sector have also incorporated actions in their procedures to minimise the negative consequences of the pandemic in their activities. Mainly, the implementation of hygienic-sanitary protocols (73.3% of the total) and the reorganisation of activities and personnel (51.3%) stand out, even though the food industry usually has very demanding criteria of quality, and hygiene and food safety. In addition, those industries that manufacture and market products for different channels, such as retail and HORECA, have had to reorganise their activities. The pandemic has accelerated the incorporation of new lines that will allow the marketing of a greater volume of its products in supermarkets and hypermarkets in an attempt to compensate for the losses that will be generated by the closure of the hotel and catering business.

3.3. Changes Made as a Result of the Pandemic in Terms of Product, Services, Brand, Product Format, and Consumer Behaviour

Furthermore, the agri-food industries have incorporated changes mainly in the performance of their products and services to meet the changing market trends and the demands of their customers. Conversely, concerning changes in terms of the brand and format of their products, 70% of the total number of industries surveyed in Extremadura do not incorporate these changes in their products (64% of the total).

Finally, it has been observed that, except for the implementation of strict hygienic-sanitary measures, the results of the chi-square test reveal that the consequences, actions and changes are independent and carried out based on the branches of activity, which reveals that the pandemic has affected the agri-food industry equally.

4. FUTURE RESEARCH DIRECTIONS

Future lines of research will focus on exploring and extending the effects of the coronavirus in the post-pandemic stage in Extremaduran agri-food industries.

5. CONCLUSION

The coronavirus pandemic has affected all branches of Extremaduran agri-food activities. The pandemic is causing different negative impacts affecting the financial performance of the Extremadura agri-food industry (decrease in turnover and demand of products in the branches of agri-food activity). This has affected, in particular, firms related to the HORECA channel, which remained closed and suffered numerous restrictions from the state of alarm in March 2020. Agro-industries have also faced difficulties affecting their operational performance. The lack of personnel is one of the main ones, especially in those activities subject to the seasonality

of their products (e.g. fruit and vegetable plants), and the difficulties in carrying out marketing activities. In response, firms have taken actions that allow them to adapt their activities and face the negative effects, guaranteeing their continuity. Mainly, the industries have promoted the use of ICTs in their communication and trade activities, as well as the incorporation of more demanding hygienic and sanitary protocols. In relation to the changes included in their organizations, these are mainly based on the performance of their products and services. The consequences, actions, and changes produced by the pandemic have affected the agri-food industry equally and, except in the implementation of more demanding hygienic and sanitary protocols, there is no association between them and the different branches of activity.

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Digitization of Agriculture: Mobile Applications in Agriculture as an Important Aspect of the Third Green Revolution

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Abstract: *Information and communication technology has caused (r)evolution in many industries, and the agricultural sector is not an exception. The paper deals with the use of mobile applications that have informative, educational and advisory services in agricultural activities. The paper aims to present the features and benefits of the use of mobile applications in agricultural production. The use of these applications enables the spread of specialized knowledge in certain agricultural sectors practically and easily, and at the same time contributes to the increase of efficiency in agricultural production. The link between the public advisory service and farmers and the dissemination and exchange of good practices among farmers are important features of mobile applications in agriculture aimed at raising the overall competitive advantage. The research is expected to prove the role of mobile applications in the development of the third green revolution in the agricultural sector.*

1. INTRODUCTION

The paper deals with the role of mobile applications in raising the efficiency of agricultural production. The relevance of the research subject stems from the fact that the conventional approach to agriculture is unsustainable and that it is necessary to carefully monitor and optimally use production resources with the aim of higher yields, but also the ultimate quality of agricultural goods. The research aims to present the features and benefits that result from the use of mobile applications in agricultural production.

The paper is divided into a total of six thematic units. After the introduction, the concept of the third green revolution was explained within the framework of the development of the use of information and communication technology in agriculture. The features of mobile applications in agriculture and the functions to which mobile applications contribute to the realization of the third green revolution are presented in the following thematic units. Then, the basic assumptions for the successful implementation of mobile applications in agriculture are analyzed, with an emphasis on social and technological assumptions. The basic results of the research are presented in the concluding section.

2. THE THIRD GREEN REVOLUTION

In order to approach the elaboration of the research problem comprehensively, it is first necessary to explain in detail the concept of the third green revolution. A third green revolution is an innovative approach and view of agricultural production. The context in which the third green

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revolution is taking place is the extremely high degree of urbanization and the ever-growing world population, as well as the growing awareness of the importance of organic farming for human health and well-being. The third green revolution, therefore, requires the adaptation of agricultural production to the way of life of modern man. Aspects of the third green revolution are numerous and range from the incorporation of agricultural crops into urban lifestyles to the use of "smart" systems based on information and communication technology in the process of agricultural production (Suma et al, 2017).

The third green revolution aimed at using information and communication technology to raise yields and the quality of cultivated food is a real step towards the development of agricultural products that meet the needs of humankind from a nutritional, economic and environmental point of view. The third green revolution is therefore based on the idea of realizing a rational approach to agricultural effects, respecting the principles and frameworks of sustainable development. The fundamental question that the Third Green Revolution seeks to answer is how to feed humanity sustainably? (Horlings, Madsen, 2011).

The use of information and communication technology in modern agriculture and in the context of the third green revolution should be understood as a means of facilitating networking and connecting different stakeholders in the system of "smart" agricultural production, to promote knowledge management on sustainable access to agricultural production and communication ideas and good business practices among stakeholders involved (Mbow et al., 2014). One of the approaches that promote the concept and philosophy of the third green revolution is the use of mobile applications in agriculture.

3. MOBILE APPLICATIONS IN AGRICULTURE

The use of mobile applications in agriculture has become possible thanks to the development of smartphones, tablets and similar computing devices. Although technological development is crucial as a precondition for the development of "smart" agricultural production and turning to the principles of the third green revolution, the use of mobile applications in agriculture should be understood as a powerful driving force for social change. Therefore, in this research, the use of mobile applications in agriculture will be understood from the socio-technological aspect, and the applications themselves are understood as socio-technological systems.

The aim of developing mobile applications in agriculture is to ensure the networking of farmers with key stakeholders in the public sector and/or academia in order to systematically and continuously work on the adoption and dissemination of new knowledge on agricultural production and to promote sustainable production principles. In this way, it also significantly contributes to the optimization of agricultural production in the spirit of the needs of the 21st century, which seek to balance economic, environmental and social goals. The need to use mobile applications as a means and tool in the process of developing specialized knowledge of farmers arises from very fundamental reasons. Significant soil, air and water pollution resulting from the conventional approach to agricultural production are key issues that need to be addressed at the level of the agricultural community as a whole. In addition, a "smart" approach to agricultural production ensures the rational use of resources following the continuous monitoring of the state of agricultural production through a monitoring system (Gondchawar, Kaeitkar, 2016).

4. FUNCTIONS OF MOBILE APPLICATIONS IN AGRICULTURE

The advantage of mobile applications in agricultural production is that they provide the ability to monitor and control the real state of agricultural crops, effective networking with the aim of education, consulting and coordination, successful cooperation at the value chain level and monitoring and recording the sequence of production processes market users. These functions do not exhaust the benefits of using mobile applications in agricultural production because each application can be upgraded and adapted to the specific needs of target user groups.

4.1. Monitoring the Real Situation of Agricultural Crops

Monitoring the real state of agricultural crops is the basic function based on which the real needs for the implementation of certain agro-technical measures are assessed to optimize the effects of agricultural production sustainably. Without a real-time monitoring system, many aspects of agricultural production are left to empirical assessment, and such an approach can result in significant impact reductions. (Pimentel et al., 2004).

Real-time monitoring of agricultural crops is carried out through the implementation of temperature and humidity sensors, lighting sensors, insect presence sensors and video surveillance, which enables real-time monitoring and prevention of disturbances to agricultural holdings. All of these sensors communicate with the mobile app by sending real-time status reports to farmers (Gondchawar, Kaeitkar, 2016).

The system of supervision or monitoring is the basis for continuous monitoring of crop conditions and successful regulation of agricultural production conditions in accordance with key physical and biological-chemical parameters. The sensors are connected to individual automated systems, such as irrigation and lighting systems, and the use of mobile applications in agricultural production can greatly automate the implementation of individual production processes or manage remote processes according to assessed needs. The already described role of monitoring and automation in the management of agricultural crops is making significant progress towards increasing production efficiency and rational use of resources.

4.2. Networking, Educational-Advisory Role and Development of Good Production Practices

The role of mobile applications in agricultural production is not limited to monitoring, automation and efficient remote management. This is just one aspect by which IT technologies improve business in the agricultural sector. Another and very important function of mobile applications in agriculture is focused on effective knowledge management. In agricultural practice so far, farmers have relied on their own, largely inherited knowledge of how to manage agricultural resources, and such practices have significantly contributed to the adverse environmental impact of agricultural production globally. An example of one such practice is the irrational and uncritical use of pesticides in agricultural production which has caused numerous negative consequences for food safety for humans (Knežević, Serdar, 2011) and ecosystem sustainability; for example, through the impact on the disappearance of bees as key natural pollinators (Tucak et al., 2015).

Ignorance combined with striving for the highest possible yields can result in uncritical use of pesticides and a generally irrational approach to resource management in agriculture. For this

reason, the educational, informative and advisory function of mobile applications in agriculture is especially important, which contributes to the construction and application of good practices in the implementation of certain production processes. Mobile applications are therefore often networked with public or academic advisory bodies and serve as two-way communication between the advisory body and farmers. Through the mentioned function of mobile applications, experiential learning and application of good agricultural practices and dissemination of good practices within the network of agricultural producers are systematically supported.

Mobile applications are communication and coordination tools that support the process of knowledge management and dissemination of knowledge in individual agricultural sectors. "The Internet, along with other information and communication technologies (ICT), is a means of bridging the gap between professionals from different professions, people from rural areas and agricultural producers, through interaction and dialogue. It can also strengthen new cooperation and networking through cross-sectoral connections between government institutions, various support agencies and farmers themselves" (Turkalj, 2012, p. 74). Modern technological communication solutions support the synergistic impact arising from networking and knowledge sharing among different stakeholders in agricultural production.

The development of mobile applications ensures the cooperation of theorists and practitioners in agricultural production and the collaborative approach leads to the construction of new insights aimed at continuous improvement of production practices and strengthens the competitiveness of agricultural entities in the market. The link between advisory services and farmers as well as the exchange of experiences between farmers has been significantly facilitated. Advisory services are thus able to provide individually tailored guidelines to farmers based on monitoring results and are also well acquainted with the real situation on the ground and the development of strategies that are feedback on the real needs of farmers. In this way, it contributes to the systematic development of knowledge as the most significant modern market advantage (Rupčić, Žic, 2012).

4.3. Value Chain Cooperation

The benefits of networking are also ensured through cooperation with stakeholders in other phases of the overall value chain such as transport organizations, agricultural processors and distributors. "The basic concept of the value chain starts from the assumption that all types of organizations, regardless of whether they are profit-oriented or not, are composed of a set of activities oriented to the same common goal. Activities are a connected system that closes the whole from the procurement of raw materials to the delivery of finished goods to consumers in the market "(Lozić, 2017). The development of cooperation in the chain process values brings welfare characteristics to the entire sector. The essence of successful value chain management is the adoption of a market orientation aimed at meeting the demands of all stakeholders in the chain.

Communication and exchange of market information is the basis for the adoption and development of orientation in which the customer is the center of all processes. Based on cooperation with other participants in the value chain, farmers can obtain the necessary market information on customer preferences and requirements and adjust production processes accordingly. Such an approach is the basis for improving the competitiveness of agricultural production in a modern dynamic environment characterized by a large supply of agricultural products from different producers. Cooperation at the level of the value chain also results in economies of scale, i.e. reduces fixed costs per unit of product because it rationalizes the amount of dependent costs of procurement and costs of

product processing (Stipanović, 2017). Joint action based on cooperation can eliminate very high production costs arising from the fragmented and isolated market presence of individual agricultural producers. Mobile applications are therefore an important communication and coordination tool in the work of agricultural clusters and producer organizations (Sudarić et al, 2018).

4.4. Records of All Steps in The Production Process

In the modern market, significant attention is paid to the traceability process when it comes to food production. These requirements are the result of the application of the HACCP standard, but also the requirements of increasingly sophisticated customers with a developed awareness of the impact of diet on the health and well-being of every person (Filipović et al., 2008).

Mobile applications enable farmers to enter all the necessary data and records on agricultural production, which significantly raises the level of transparency of their business and contributes to the development of trust by target customers. Thus, data on the total agricultural area and location where the production takes place, the number of trees or seedlings, the total performance and the applied agro-technical measures in the production process can be entered into the application. In this way, it is easier to cooperate with impartial certification bodies that certify the food quality and safety management system of individual producers.

5. PREREQUISITES FOR SUCCESSFUL IMPLEMENTATION OF MOBILE APPLICATIONS IN AGRICULTURE

Mobile applications in agriculture represent socio-technological systems. For this reason, the starting point is the sociological and technological assumptions for the successful implementation of mobile applications in agriculture.

Competences that enable the efficient use of all IT solutions in business, including mobile applications in agriculture, relate to information (computer) and information literacy. Computer or information literacy includes a set of competencies that ensure access to and retrieval of certain information content (Vrkić Dimić, 2014). By its nature, computer literacy is a set of specialized technical competencies. With user-friendly mobile applications, and interfaces that are highly user-friendly and intuitive, acquiring computer literacy skills can be assessed as relatively simple.

Information literacy of each stakeholder is the process of processing available information content into useful and practically usable knowledge in the processes of agricultural production management. Based on information literacy, a cognitive process takes place or the process of converting data and information into business knowledge that contains an additional market value and represents good manufacturing practices. Evaluating the information available plays a key role in creating a competitive advantage in modern market conditions (Rašidović, 2018). Information literacy can be counted among the social preconditions or prerequisites for the successful implementation of mobile applications in agriculture.

Another important social prerequisite for the successful implementation of mobile content in agriculture is the developed awareness of all stakeholders about the needs and benefits of networking in both physical and virtual environments. It is therefore very important to motivate farmers to use mobile applications through the presentation of their features and the development of awareness of how they can positively affect their competitive advantage.

6. CONCLUSION

The paper analyses the role of mobile applications in agriculture as an important aspect of the third green revolution. The third green revolution concerns the adaptation of agricultural production to the modern way of life. The use of IT technology in agriculture significantly contributes to increasing production efficiency and cost rationalization. Mobile applications in agriculture enable monitoring of the real state of agricultural crops and management based on the analysis of the real state, which optimizes the use of resources. The educational and advisory role contributes to the combination of theory and practice and the creation of additional market value based on synergistic relations of cooperation, partnership and exchange of opinions and ideas. These values do not only apply to farmers but have the potential to spread to the entire value chain. Mobile applications also facilitate the documentation and traceability of all production steps and are an important tool in the implementation of quality management systems. The successful implementation of mobile applications in agriculture is conditioned by the competencies of information and information literacy as well as the motivation for networking and the development of a culture of cooperation, dialogue and partnership in creating additional market values.

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Knowledge Management and Web 2.0/3.0

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Abstract: *Knowledge needed for managing an organization and making optimal decisions is growing constantly and needs to be acquired fast. To achieve this goal, knowledge management benefits from the continuous and rapid development of information technology. Various technologies and tools can be used to support knowledge management processes and the most prominent for organizations of all sizes is Web 2.0. But Web 3.0 is starting to give new possibilities to better manage knowledge and thus gain a competitive advantage. This paper analyses current opportunities that Web 2.0, with its user-generated content, provides to organizations - especially in a turbulent environment, by facilitating knowledge management processes. Web 2.0 tools are examined according to their use for specific processes and their future potential for organizations. The Paper also investigates possibilities of Web 3.0 features, such as decentralization and connectivity, as well as the use of artificial intelligence and machine learning, for the new era of knowledge management. Those arising technologies promise more opportunities for better use of knowledge in organizations.*

1. INTRODUCTION

Knowledge is a necessity for optimal business decision making and achieving a competitive advantage for an organization. Each day large volume of diverse data is generated, from which various information can be derived and new knowledge acquired. The problem of big data is not new, and data management that includes several data processing steps – integration and cleaning, reduction, indexing and querying and analysis and mining (Chen et al., 2013) – is part of the lifecycle of knowledge in the organization. Sharing this knowledge is the main driver of accomplishing organizational goals.

An important part of the lifecycle are also various technologies that support the processes of knowledge management. Existing and new emerging technologies and tools, including Web 2.0 and Web 3.0, enable organizations to manage knowledge more successfully. They proved their value during the COVID-19 pandemic and offer various possibilities for support of knowledge management processes.

The paper is structured as follows. In Chapter 2 is given an overview of knowledge management through the description of knowledge management processes, as well as an overview of support of the processes with various technologies. Web 2.0 and the use of Web 2.0 tools for specific knowledge management processes are explained in Chapter 3. In Chapter 4 features of Web 3.0 are described as well as the potential of its emerging technologies for better knowledge management. Chapter 5 proposes potential directions for future research and Chapter 6 concludes the paper.

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2. KNOWLEDGE MANAGEMENT AND INFORMATION TECHNOLOGY

There is no doubt that knowledge management is one of the critical elements of managing any organization. It can be defined in various ways, in a more general or specific manner, but it is commonly said that it is a process that enables the knowledge lifecycle in organizations, from its creation or acquisition, storage, analysis and visualization to sharing and application (Girard & Girard, 2015). Authors usually divide knowledge management by lifecycle stages into three to six processes and some further into subprocesses. We will use here a division that is mostly based on knowledge conversion between explicit and tacit knowledge proposed by Nonaka (1994) through four processes – socialization (tacit to tacit), combination (explicit to explicit), externalization (tacit to explicit) and internationalization (explicit to tacit). According to Becerra-Fernandez and Sabherwal (2014), four main processes, each with two subprocesses, are:

- **Knowledge discovery** in which new explicit knowledge is created in combination and new tacit knowledge is created with socialization,
- **Knowledge capture (**we will use the term **acquisition)** in which tacit knowledge is converted into explicit with externalization and explicit knowledge is converted into tacit with internalization,
- **Knowledge sharing** in which explicit knowledge is distributed with exchange and tacit knowledge with socialization, and
- **Knowledge application** in which procedural (explicit or tacit) knowledge is used with the help of directions and routines.

Lifecycle of knowledge within organization is facilitated by knowledge management. This would nowadays be impossible without the inclusion of latest information technology. Importance of information technology was recognized from the first stage of knowledge management development when it was actually the focal point (McInerney & Koenig, 2011).

It firmly stays as an important knowledge management pillar together with leadership/management, organization and learning (Stankosky, 2005) and this is why continual adoption of new technologies is needed. Also, there is an abundance of technology already implemented in organizations that can also have an impact on specific knowledge management processes and can be used according to organizational needs and possibilities.

Table 1. Knowledge Management processes and associated technologies

Knowledge Management Processes	Illustrative Knowledge Management Technologies
Knowledge discovery	Databases, Web-based access to data, data mining, repositories of information, Web portals, best practices and lessons learned, videoconferencing, electronic discussion groups, e-mail
Knowledge acquisition	Expert systems, chat groups, best practices, and lessons learned databases, computer-based communication, AI-based knowledge acquisition, computer-based simulations
Knowledge sharing	Team collaboration tools, Web-based access to data, databases, and repositories of information, best practices databases, lessons learned systems, and expertise locator systems, videoconferencing, electronic discussion groups, e-mail
Knowledge application	Capture and transfer of experts' knowledge, troubleshooting systems, and case-based reasoning systems, decision support systems, expert systems, enterprise resource planning systems, management information systems

Source: Becerra-Fernandez, & Sabherval, 2014

Table 1 shows various technologies that can be used to facilitate specific knowledge management processes (Becerra-Fernandez & Sabherval, 2014). Many standard technologies that organizations already use are listed, such as databases, information repositories, web portals, video-conferencing, chat groups, e-mail, team collaboration tools, enterprise resource planning systems or management information systems. These technologies can also be purposefully used for knowledge management. Some technologies are more specific to knowledge management, for example, best practices and lessons learned databases or expertise locator systems. Other technologies belong to the artificial intelligence field, namely expert systems, decision support systems, or AI-based knowledge acquisition. Therefore, large number of technologies are offered and organizations can choose those that would give support to knowledge management processes that are most critical to them. Not all processes need to be supported in an equal manner, but instead, support should be carefully weighted according to benefits and costs.

3. USE OF WEB 2.0 TOOLS FOR KNOWLEDGE MANAGEMENT

The COVID-19 pandemic forced many organizations to move their work online. Many are still working at least in a hybrid way and probably will stay working that way because research shows that, among others, flexibility that it gives improves the number of high performers, improves satisfaction with organizational culture and gives equal opportunity for team innovation as work in the office (Gartner, 2021b). This is why the adoption of technologies that enable and improve online work, including Web 2.0, is very important for organizations.

It is well known that the idea of the Web was born in 1989. In its first phase, now called Web 1.0, most of its users were only consumers and pages were mostly static. Web inventor, Tim Berners-Lee started the work on new vision of web, the Semantic Web, in 1999. In this year the term Web 2.0 was also coined (DiNucci, 1999), and at some point the Semantic Web was considered as Web 2.0 (and later also as Web 3.0). After its first mentioning, the term Web 2.0 was popularized by Tim O'Reilly, who explained it with example applications and named its characteristics, such as more access to data and more participation from users (O'Reilly, 2007). Users participate actively in generating content and at the same time their experience is better because Web becomes dynamic and interactive.

Main components of Web 2.0 technologies, or Enterprise 2.0 (technologies that help the knowledge work in organizations) are comprised in acronym SLATES (McAffee, 2006):

- **Search** – Internet search by keywords with better search technology,
- **Links** – broad link structure build by many contributors,
- **Authoring** – many individuals (for example, blogs) or group (for example, wikis) authors that contribute new information,
- **Tagging** – content categorization with tags by users that creates folksonomies,
- **Extensions** – automatic categorization and pattern matching for better individualization, and
- **Signals** – notices for users about new interesting content (for example, RSS – really simple syndication).

Web 2.0 technologies and applications contribute positively to knowledge management, especially to communication and collaboration (Andriole, 2010;), so here we will address them as tools. Many are used in knowledge management, such as wikis, shared workspaces, blogs, chats, forums, communities of practice, tagging, social bookmarking, social networking,

videoconferences, audioconferences, podcasts, webcasts, RSS or knowledge pills (Andriole, 2010; Bebensee et al., 2012; Levi, 2009, Mazur et al., 2015.). Mazur et al. (2015) divided knowledge management into five processes (identifying, creating, storing, sharing and applying knowledge) and suggested the use of Web 2.0 tools for specific processes. Some of technologies in Table 1 already belong to Web 2.0 and Table 2 shows which above mentioned Web 2.0 tools can foster processes from Table 1.

Table 2. Knowledge Management processes and associated Web 2.0 tools

Knowledge Management Processes	Web 2.0 tools
Knowledge discovery	wikis, shared workspaces, blogs, chats, forums, communities of practice, social networking, videoconferences, audioconferences
Knowledge acquisition	wikis, shared workspaces, blogs, forums, communities of practice, tagging, social bookmarking, podcasts, webcasts, videoconferences, audioconferences, knowledge pills
Knowledge sharing	wikis, shared workspaces, blogs, chats, forums, communities of practice, tagging, social bookmarking, podcasts, webcasts, social networking, videoconferences, audioconferences, RSS, knowledge pills
Knowledge application	wikis, blogs, forums, podcasts, webcasts, videoconferences, audioconferences, knowledge pills

Source: Authors' work

Tools in Table 2 and their characteristics are well known, and all of us use at least some of them every day. It is obvious that many can foster all four knowledge management processes, if purposefully incorporated into daily work of an organization. The biggest advantage of using them is obviously for knowledge sharing, especially tacit knowledge (Anupam, 2015), but they also make discovery and acquisition of knowledge less difficult. They are very easy to use, available and cost-effective. For those reasons, they are especially applicable for small and medium organizations as main information technology support for knowledge management. However, sharing misinformation is also easier, and mechanisms to prevent it should be implemented.

Web 2.0 tools enable faster access to data, information, knowledge and experts as well as external stakeholders, and also faster communication and collaboration - or continuity of communication in special circumstances. During COVID-19 pandemic they helped organizations to overcome obstacles of quarantine and to continue work, some even almost as before pandemic. Most of those tools are also used for private social interactions and some were already used in organizations, so employees have fewer drawbacks to using them at work. After positive experience during COVID-19 pandemic, Web 2.0 tools are unavoidable in daily work of any organization.

4. WEB 3.0 POTENTIAL FOR KNOWLEDGE MANAGEMENT

Over years under Web 3.0 was considered an upgrade of Web 2.0 with various technologies such as Big Data, cloud computing and the Internet of Things (Newman et al., 2016), as well as already mentioned Semantic Web. Currently, main discussed features and technologies that should make Web 3.0 are (Chohan, 2022; Gaur, 2021; Ginsburg, 2022; King, 2022; Mazieri et al., 2022; Srupsrisopa, 2022;):

- **Decentralized information and knowledge** – content or services are not controlled by one individual or organization and their storage is distributed, where main role has a blockchain;

- **Blockchain** – shared distributed database, where encrypted content is stored on a distributed ledger as blocks connected into chains and each block has a reference to a previous block, as well as written time of creation and its transactions;
- **Non-Fungible tokens (NFTs)** – tokens stored in a blockchain that enable and prove ownership over any content with unique properties by a single user, usually used for creative products, such as digital art, but can also be used for anything else (identification, healthcare record, a house…);
- **Decentralized Finance (DeFi)** – open and distributed financial system based on a blockchain and cryptocurrencies, where financial products and services (lending, borrowing, investing, salary payment, token trading…) can be directly accessed by anyone on Internet, without intermediaries and central authority;
- **Trustless and permissionless interaction** – each user owns its identity (and needs only one profile) and there are no intermediaries in various interactions because of decentralization, which leads to no need for trust to third party and no need for permission from third party;
- **More connectivity and ubiquity** – content on Internet is interconnected and ubiquitous with various smart devices connected, enabled by Internet of Things and other technologies; and
- **Artificial Intelligence** – many technologies belonging to artificial intelligence can foster Web 3.0, such as machine learning or virtual and augmented reality.

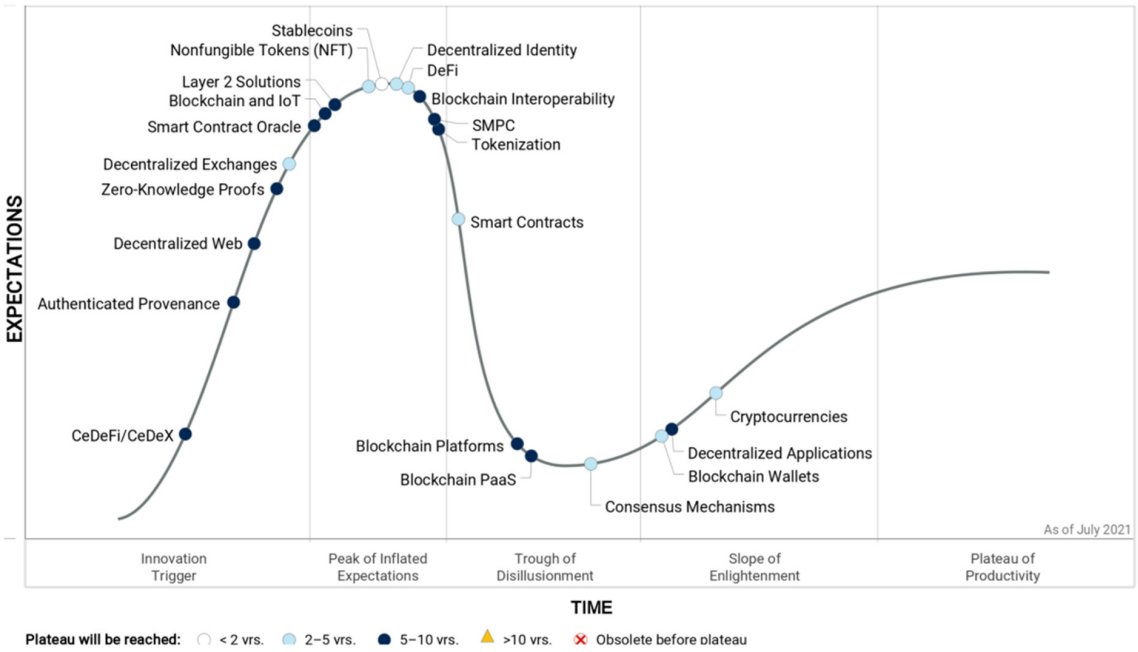

Figure 1. Gartner Hype Cycle for Blockchain
Source: Litan, 2021 (Gartner, July 2021)

Figure 1. shows the 2021 Gartner Hype Cycle for Blockchain, with above mentioned and other expectations for blockchain (Litan, 2021). NTFs and DeFi are at the peak of expectations, but Centralized Decentralized Finance (CeDeFi) with Centralized Decentralized Industry (CeDeX) – X meaning every industry – is emerging.

With further development of Web 3.0, its potential for application in various fields is investigated, including knowledge management. According to Gartner (2021a), edge technologies, such

as edge networking, edge computing and edge servers, that enable information analysis close to data storage have important enterprise value. Machine learning significantly improves data analysis, and blockchain, as a shared distributed database can have large impact on knowledge storage and sharing. There is also a proposal for knowledge management model based on a blockchain, that explains benefits of using blockchain for all knowledge management processes - creating, storing, sharing and using knowledge (Akhavan et al., 2018).

Decentralization of storing knowledge with more connectivity and ubiquity, and enabled trustless and permissionless interaction ensure even faster access to data, information and knowledge for organizations, with no need for intermediaries. Augmented education and training proved as a solution for various elements of business in special circumstances, such as COVID-19 pandemic. With these features and technologies processes of knowledge discovery and acquisition can be significantly improved. Better user experience and social interactions also foster these processes. Of course, all those features make the process of knowledge using also easier. There are, of course, ethical issues, because unethical activities can be performed without a central authority that controls them.

5. FUTURE RESEARCH DIRECTIONS

Web 3.0 is evolving with many exciting emerging technologies and features that they will enable. Their use in knowledge management, and especially for specific knowledge management processes should be further explored. One direction of research should analyze the benefit of Web 3.0 technologies in relation to their costs, according to various types and sizes of organizations and their business goals. It should be established which technologies and features would be of advantage for specific knowledge management processes according to a given set of criteria. Although Web 2.0 and to some point Web 3.0 proved as a solution during COVID-19 for many organizations, an optimal limit of their use and potential drawbacks must be carefully researched. And, of course, possible ethical problems must be analyzed, because they can negatively affect an organization and with the development of the Web possibilities of unethical and illegal activities are rising.

6. CONCLUSION

With new technologies emerging continuously and the features, they will enable, there are many open possibilities for organizations, that will lead to a change of business models and also different approaches to knowledge discovery, acquisition, storage and application. Knowledge management is adapting continuously to the fast development of information technology because this ensures that an organization will be able to continue its business and develop.

Web 2.0 and 3.0 technologies have a large potential to support all knowledge management processes if their implementation is justified and purposeful, with awareness of benefits and potential issues. Some of the features of Web 3.0 still need to be adopted and enter mainstream usage, and not all of them will be appropriate or cost-effective for all organizations. But most of them will offer a better solution for knowledge management processes in various circumstances.

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Exploring Knowledge Transferring and Conversion in the Fuzzy Front End of Collaborative Innovation Development

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Knowledge conversion

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Abstract: *The research goal is to investigate the specificity of activities of startup entrepreneurial teams that co-develop new product concepts with stakeholders.*

We identified a specific pattern of knowledge conversions/transferring through observations of collaborative activities, followed by questionnaires and interviews with members of the entrepreneurial team.

The research pool comprised eleven entrepreneurial teams of 4-6 members each. The predominant objects of conversions and transferring among the entrepreneurial team members and external stakeholders were identified as tacit knowledge types: know-how (what, why), insights, intuition, attitudes, beliefs (as a type of attitudes), and entrepreneurial vision. Types of conversions and transferring were the same in all the teams but the application of managerial tools (facilitating means) that allowed transferring/conversions varied. The identified specificity of knowledge processing could be used to optimize those tools/methods by elaborating specific measurable criteria of how efficiently tacit knowledge was transferred and converted.

1. INTRODUCTION

The research project in progress has three phases (milestones) of research results. The first two were published at the conference proceedings Laptev and Shaytan (2021). The last phase result of the research is revealed in the current paper.

The research project started from a broad question of how we can improve the management of an entrepreneurial team (ET) that co-develops innovative product/service concepts with customers/users/consumers at the fuzzy front end of innovation (FFE). To narrow the broad research question, we decided to apply the ground theory (Birks and Mills, 2015; Chun *et al*., 2019) approach.

First, we gathered qualitative data by observing ETs working (acting) in a natural environment; then we identified prospecting research objects for hypothesis creation and more detailed investigation through observations, questionnaires, and in-depth interviews. The pool of ETs was at the premises of the university accelerator "innovationStudio". The first milestone/result of the research project is the creation of the general knowledge transferring and conversion (KN&C) model specific for the ETs new/innovative product development at the FFE. The generalized overview of the KN&C model is presented at the conference proceedings Laptev and Shaytan (2021). The next research milestone is the identification and prioritization of barriers that impede knowledge transfer and conversion (Laptev and Shaytan, 2021).

The third, current phase milestone/goal of the research project is detailing the KT&C model to approach operationalization criteria that can be used to improve entrepreneurial management

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by using identified attributes (properties) of the KT&C. Managerial operationalization of the KT&C model and the barriers are the way to improve management of entrepreneurial teams in co-developing innovative products at the FFE. Somehow the initial broad research question became a strategic goal (or a vision) that drove the ongoing research in progress.

This paper contributes to the whole research project by offering a specific pattern/scheme of the KT&C at the ET in the FFE of collaborative new/innovative product development.

The fuzzy front end (FFE) is the stage inside the new/innovative product development (NPD) process where a feature set of innovative products is determined and validated (Koen *et al*., 2014); i.e. the stage that corresponds/overlaps with the "customer discovery" stage (Blank, 2013).

As a common best practice, the FFE is driven by four advanced paradigms.

(1) The "user centered design" (Zorzetti et al., 2022) that in a broader (more complex context) can be worded as the design driven by the requirements of stakeholders. Also, it can be regarded as part of the paradigm named "requirements engineering" (Yin et al., 2022), which aims to build a prioritized requirements list (product backlog) in the eyes of users/consumers/customers or even border category -stakeholders.
(2) The "lean startup" (Zorzetti et al., 2022) is a type of management that priorities validation of viability of a product and business idea in short incremental development cycles. If there is a lean startup manifest then it comprises statements: "fail fast", "planning is a must, but your plan is zilch/insignificant", "bootstrapping validated learning", "customer/stakeholder feedback is worth more than your intuition/judgement"; i.e. the lean startup paradigm overlap with agile management approach/paradigm but has its own wordings to stress attention to particular entrepreneurial management attributes.
(3) The "customer discovery" is part of the "customer development model" (Blank, 2013) and is characterized by the set of managerial objectives and milestones in the development of a startup and new/innovative product/service development.
(4) Entrepreneurial management– a general type of managerial approach to identify and pursue opportunities without regard to resources currently controlled (Gartner and Baker, 2010). The type of management refers to the development of startups that are built around new valuable/competitive solutions (products/services) that address identified values of customers/users/consumers.

Management can be defined as processes/activities of identifying goals/objectives/ requirements, establishment of process to pursuit those goals/objectives, and establishment of attributes and metrics to control the achievement of these metrics. The above paradigms outline a common advanced management structure for NPD and startup development by entrepreneurial teams. When we say outline, we mean that a manager has fundamental general principals and milestones to follow in detail to implement a management system for a particular NPD project (milestones, i.e. goals and tasks that the validation of achievements identifies and moves on to the next development phase).

Nowadays, mostly all NPD projects are managed with components of Agile (flexible) type of management structure, and commonly use concepts from "SCRUM" or "Kanban". Modern teams consist of designers, engineers, business analytics, and entrepreneurs.

For our research, it is necessary to distinguish an entrepreneurial team, the object of our research, from the design/engineering teams as both types manage NPD process. An entrepreneurial team that works on a new/innovative product has broader product acceptance criteria related to business model construction-validation, broader responsibilities in relation to start-up building, etc. to use it as a means for a value proposition implementation. Those extras over common responsibilities of designers and engineers add new risks to be taken by entrepreneurial teams (ET) and add extra management complexity.

The first part of our research project revealed that the extra management complexity at ETs leads to a significant reduction in explicit-to-explicit knowledge conversions (Laptev and Shaytan, 2021). ETs, in comparison with design and engineering teams, don't have "time" (i.e. don't have enough motivation) to document explicit or implicit knowledge. Documentation is regarded as an extra burden with no significant "pay off". At the FFE of NPD, entrepreneurial teams demonstrated extreme follow-up of the Agile manifest principle that the delivered feature is more important than a document. In case of limited resources (bootstrapping and lean startup strategy of development) and extra complexity of management system, entrepreneurial teams (ETs) sacrifice common design and engineering practices of documentation. The 4-mode SECI (socialization, externalization, combination, and internalization) model (Nonaka and Tackeuchi, 1995) of the knowledge conversion have a distinct form of the 3-mode SEI (socialization, externalization, and internalization) model of knowledge conversion in the case of ET in the FFE of NPD process according to Laptev and Shaytan (2021). At an ET in the FFE of NPD that leads to "Combination" mode loss and affect significantly new knowledge generation. Contrary, for design and engineering teams a new knowledge generation is significantly based on pre-coded knowledge (for example, libraries), the "combination" mode.

In this research project, ET in the FFE of NPD had collaborative counterparts – innovative/lead users. These users are allowed to follow requirements engineering principles in the form of user/customer centered design. Moreover, collaboration with innovative/lead users is regarded as co-creation through the exchange of the most valuable innovative asset - tacit knowledge.

The collaboration concept was investigated before from various directions as a process for cross-organizational linkage (Emden et al., 2006), cross-enterprise processes (Deck and Strom, 2002; Bodas Freitas and Fontana, 2018; Sinkovics et al., 2018), as well as customer co-creation of innovation in corporations and SME's (Vrandea et al., 2009; Frow et al., 2015; Kleber, 2019).

Knowledge is built up from data and information, and, of course, prior knowledge. The knowledge, and its various concepts, bear various meanings that depend on ontological perspectives and contexts. In a broad sense, knowledge is defined as awareness or understanding of something. Levels of awareness and understanding vary; and, in some contexts, researchers even require opposing the awareness concept to the knowledge one (Trevethan, 2017). However, the scope of our research requires us to set knowledge concepts around the transition of knowledge and to leave discussions about concepts of familiarity, awareness, and understanding over the paper.

Knowledge is one of the strategic assets of an organization. Knowledge management has the potential to produce a sustainable competitive advantage (Bollinger & Smith, 2001; Murray & Peyrefitte, 2007; Constantinescu, 2008). There are research papers devoted to knowledge management not only in large but also in small organizations and entrepreneurial entities (Hutchinson and Quintas, 2008). Knowledge management practices in small and large organizations

differ significantly (Hutchinson and Quintas, 2008). Transferring knowledge, and understanding of its conversions through learning and experience, is the essential competitive advantage in an environment with a rapid change in customer requirements and shortening product life cycles (Wang & Noe, 2010).

In this regard, it's important to further explore nuances of the knowledge transferring and conversions to extend opportunities for management methods/tools improvements.

In this paper, we refer to implicit knowledge as "easy" to codify knowledge but that was not codified yet. In the literature "implicit" and "tacit" are used interchangeably; however, at the point of building a knowledge management system, interchangeable usage will lead to misidentification of the knowledge (object) qualities and, therefore, mess up the management by using wrong strategies to its processing. The implicit knowledge is a matter of codification strategy. Tacit knowledge cannot be processed under a management system built under the codification strategy that has a lack of approaches/methods for its transferring and sharing.

The capability of becoming explicit and vice versa is an important quality that enables the continuous evolution of the knowledge base of practical and theoretical understandings. This quality is the focus of the current research and is described below through the SECI (Socialization–Externalization–Combination–Internalization) model of knowledge conversion (Nonaka and Tackeuchi, 1995).

Tacit knowledge transferring and conversion among entrepreneurial team members, and stakeholders is a core process in innovative products/services development. Our research is of value for the entrepreneurial management domain.

In reviewing the theoretical backgrounds of the tacit knowledge, we should also mention skills. Skills, according to McAdam et al. (2007), "is the epitome that is most used without any form of definition; some other terms such as ability, crafts and practical knowledge are closely related and often used in the same meaning" in the knowledge management literature. Skills, as ability and practical knowledge, are the "backbone" of the activity of any group and organization including ETs. However, our research requires to keep the focus on innovative/lead user's know-how capture/sharing/transferring as a type of skills (knowledge) facilitating opportunities for innovation insights. We left skills (in its common sense) out of the research scope and kept focus on the know-how concept.

Somech and Bogler (1999), formalize practical intelligence as "a person's ability to apply components of intelligence to everyday life". Besides the concept of practical intelligence, there are many other types of intelligence. Gardner (2003), discuss in their research the theory of multiple intelligences that is constantly evolving with new categories: linguistic, musical, logic-mathematic, bodily-kinesthetic, inter- and intra-personal, emotional, spiritual, sexual, digital, and etc. intelligences. However, in our vision, the general notion (the level of detailing) of "practical intelligence" (Somech and Bogler, 1999) that incorporates other components of intelligence suits our research goal. In the research, we can determine elements/components of its transferring on to the group level (the process of collective practical intelligence development).

Mental models or cognitive schemas or mental maps are used with similar meanings (McAdam et al., 2007) and can be described as a model of reasoning of a person or a group when they are not

able or cannot apply the structure of logical forms from formal theories, for example, from mathematics or financial analysis. Mental model reasoning is based on the principal of truth, attitudes, selective perception, and "deeply held image of the world around us" (Byrne, 2005; Johnson-Laird, 2006). In our research, we are interested in the concept of mental models as it sets an approach to solving problems, decision making (like a personal algorithm), and doing tasks. By identifying changes in a group approach to solving problems or making decisions we can identify the process of mental models sharing or transferring inside an ET. Musk (2013), in his interview, in his self-appraisal, highlights the first principals reasoning approach. However, in our research the ETs showed heavy reliance on tacit knowledge and mental models based on analogy reasoning.

The conceptual analysis of "attitude" was done by Schwarz (2007) through the research literature review and suggested that "it is more parsimonious to think of attitudes as evaluative judgments, formed when needed, rather than as enduring personal dispositions; from a construal perspective, people do not have attitudes; they form judgments; their judgments stand in the service of action and high context-sensitivity is a necessary feature of any adaptive system of evaluation". A lot of discussions were devoted to the measurement of attitude strength to address the attitude stability and change.

For example, a person's/group's changing attitude to time can present context-sensitivity and adaptability of the attitude (Przepiorka, 2012). Attitude context-sensitivity and adaptability play a significant role in a particular mental model transformation. Attitudes/judgments can be regarded as an item/object of the mental models, and they can be identified in the research by observations, questionnaires, and interviews. Detection of their transformation logically identifies a change in a particular mental model.

So, belief is a type/category of attitude distinguishing proposition about a particular case or matter from being true or false. The propositional attitude can be viewed as a dispositional quality of mind that appear in a context. For example, "Some cats are green"; "some customers require fur coats in summer". A person that never came across these cases and had not had beliefs about them in his mind would respond with a propositional attitude. The attitude is adaptable if evidence shows acceptable evidence/revelation.

While investigating transferring of the vision among the team members Preller et al. (2020) found that "founders often purposefully do not communicate their entrepreneurial vision to teammates and stakeholders to avoid potentially negative consequences" and that "founding team members may hold different entrepreneurial visions" even not shared/transferred.

Tacit knowledge represents internalized knowledge, engrained with actions and experience, while including cognitive and technical elements, e.g., mental models, skills, and ingenuity (Nonaka and Tackeuchi, 1995; Agan et al., 2018).

SECI (Socialization–Externalization–Combination–Internalization) model of knowledge conversion illustrates how two types of knowledge are converted to one another (1-from tacit to tacit, 2- from tacit to explicit, 3- from explicit to explicit, 4- from explicit to tacit) and create new knowledge model (Nonaka and Tackeuchi, 1995).

In response to expanding importance and demand for knowledge transferring/sharing both in society and the business environment, the study of knowledge transferring/sharing barriers in

different organizations took place (Zammit, 2015; Riege, 2005; Yeşil and Hırlak, 2016 Akgün et al., 2017). Innovation activities stimulate research of tacit knowledge transferring barriers (Haldin-Herrgard, 2000; Cumberland and Githens, 2012).

2. RESEARCH DESIGN AND PROCESS

In this research project, we study eleven ETs that iterate through hypothesis-validation loops in the FFE of innovation product co-development process with objectives to create a validated value proposition, minimal viable product backlog, and business model concept. ETs' co-development (Co-PD) was in collaboration with innovative/lead and "ordinary" users by different models of their integration in FFE of Co-PD. The research team did not affect ETs management and Co-PD with the users. We used the case study research methodology and the grounded theory methodology. By its definition, a case study is a research approach that is used to generate an in-depth, multi-faceted understanding of a complex issue in its real-life context (Yin, 1994). The grounded theory method is based on inductive reasoning with the goal to construct a theory that is grounded in collected data (Birks and Mills, 2015; Chun *et al*., 2019). The data was collected through observations in a natural environment (the "shadow" method and observed details of interactions), follow-on questionnaires (survey results to prepare guides for the in-depth interviews), and follow-on in-depth interviews.

After observations we looked for concepts/codes that can describe observation data, and create categories, we selected the core/priority ones. Questionnaires and in-depth interviews were used for clarification of findings and to get self-wordings and self-assessments from the fifty-nine participants (eleven ETs).

The previous research results of the research in progress were the 3-mode SEI (socialization, externalization, and internalization) model of knowledge conversion and identified a list of priority barriers to the knowledge transferring and conversions (Laptev and Shaytan, 2021).

3. RESEARCH RESULTS

The current results are the scheme/pattern of the tacit knowledge transferring depicted in *Figure 1.*

When an ET collaborates with innovative/lead users in the FFE of NPD, knowledge transferring/conversions could be described by this pattern in Figure 1.

Types of tacit knowledge (in orange boxes) and types of explicit knowledge (in blue boxes) transferred and converted in directions (violet arrows) and by means of actions (violet boxes) were identified. The knowledge transferring and conversions originate/proceed:

- on three levels: innovative/lead user, individual ET member, and group ET level;
- and along with hypothesis-validation iterations towards validation of milestones of the FFE (of the customer discovery stage in the customer development process).

According to the research, there are three basic steps (as depicted in figure 1: step 0, step 1, and step 2), and step 2 iterate until the ET decides that the FFE successfully passed; or terminate the project.

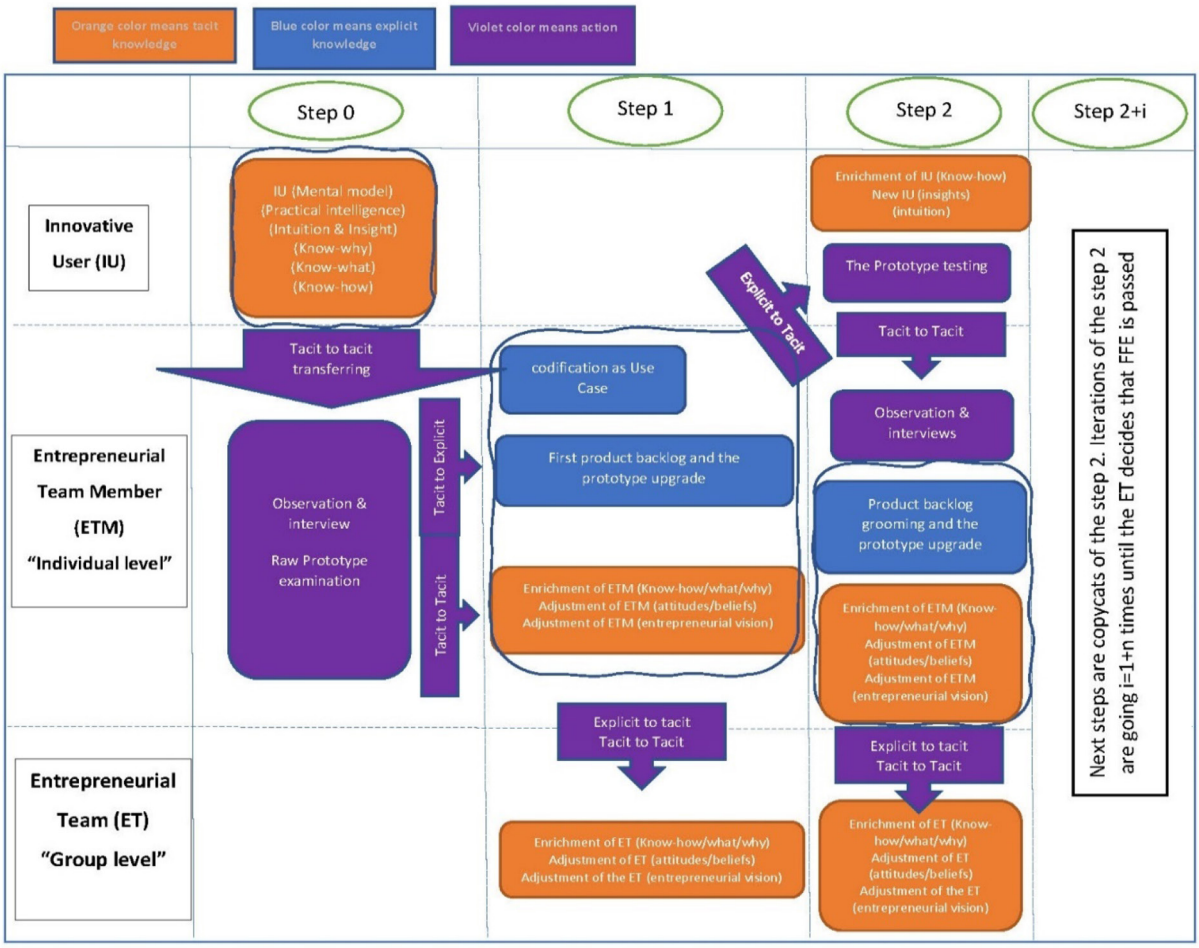

Figure 1. Pattern of the knowledge transferring and conversion in entrepreneurial projects in FFE of collaborative new/innovative product development

Source: author's elaboration based on own research

4. FUTURE RESEARCH DIRECTIONS

The research in progress will use the identified pattern of the knowledge transferring/conversions to build it operationalization model for ET management in FFE.

5. CONCLUSION

The research in progress identified entrepreneurial teams' operation negligent component of the combination (explicit-to-explicit) knowledge conversion in FFE of the collaborative new/innovative product development. This can be regarded as the key difference between an ET and a design/engineering team also working on NPD. The identified specifics of the pattern of the knowledge transferring and conversions at an ET in FFE of collaborative new/innovative product development allow assigning metrics for selected objects of the process to improve operationalization of the tacit knowledge transferring/conversion; to improve the ET management.

Our current findings are outlined in the process of how and by what means knowledge transferring and conversion happen in the entrepreneurial teams' up-to-the stage of minimum viable product concept verification. The further detailing of entrepreneurial new product creation, as a knowledge management process, could give new insight into improving methods and tools

in entrepreneurial management. This paper has limitations on the types of involved stakeholders and the scope of respondents limited to innovative/lead users and the stand-alone micro-entrepreneurial teams (i.e. they are not spinoffs, or do not have institutional/corporate level of investments).

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The Future of ICT – Is the Number of Experts in Slovakia and EU Countries Sufficient?

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Abstract: *Work positions are constantly changing and evolving. Some positions are disappearing, but on the other side, new ones are emerging that correspond to the requirements of the labour market. Significant changes in positions occurred mainly in the IT sector, due to the rapid development of information technology. However, over the last few years, employers have pointed to the lack of ICT professionals and this trend is expected to continue in the coming years. For example, in 2019 it was estimated that Slovakia lacked 13,000 IT specialists, in 2020 and 2021 this number increased slightly and in the following years, this number should continue to increase. Within the EU, even 500,000 missing workers are expected in this sector. It is important to note that an ICT professional means a person who understands the technical parameters of computers or controls programming, or complex processes related to information processing.*

The paper aims to describe the position of IT specialists and analyse the situation in the labour market in Slovakia and the countries of the European Union from the point of the number of IT specialists.

1. INTRODUCTION

We live in a time where information and communication technologies are affecting every area of life. Information and communication technologies are today generally considered to be essential components of economic and social development in the so-called "knowledge society" and attract the attention of governments, businesses, citizens, and civil society organizations (Krchová & Höesová, 2021). This time is also referred to as Industry 4.0. or the Fourth Industrial Revolution. Industry 4.0 is the digital transformation of manufacturing/production and related industries and value creation processes. Industry 4.0 offers new technologies to facilitate interconnection and computerization in manufacturing. It involves advanced automatic, knowledge, information, and real-time adopted production procedures (Zhang, et. al., 2021). Changes are not only in production but also in job positions in the labour market. A certain level of computer skills is required in almost all positions. Most of the candidates have basic skills, some advanced but there is a small number of IT specialists and that is the problem. Who is actually an IT specialist? According to the definition from Eurostat (2021) "ICT specialists are defined as persons who can develop, operate and maintain ICT systems and for whom ICTs constitute the main part of their job". IT specialists, also known as information technology specialists, provide support for IT departments and end users in a number of organizations and industries. They ensure that computer hardware and software, as well as networks and servers, work consistently and correctly. IT specialists may install programs, configure networks and databases, and provide assistance to end users. They tend to focus on one or more areas of IT support, such as information security, database administration, or server maintenance (Jobhero, 2022).

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An effective IT Specialist uses a variety of soft skills, technical skills and industry knowledge to provide the most efficient and comprehensive support they can. These skills include: working knowledge of relevant operating systems, software and programming, excellent problem-solving and critical thinking skills, good organization, time management and prioritization, efficient troubleshooting abilities and great customer service and interpersonal skills (Indeed, 2021).

The number of IT specialists is a really big problem for the Slovak Republic but also other countries of the European Union. According to Lelovský (2021) that is the vice president of the IT Association of Slovakia, there are about 55 000 ICT experts in Slovakia and currently, there is a lack of 10 000 them. The ICT employment rate in the EU reached 4.3% in 2020 from 3.9% in 2019. One of the key players that lead to the ICT employment growth in the EU is the pandemic, besides a high interest in the industry of younger generations and the digitalization process the EU is going through (Irascu, 2021). Across the EU27, the number of IT specialists currently stands at 8.43 million. While this number has increased the most in Germany, Ireland and Hungary over the past year, the figure needs to more than double in order to meet the goal of 20 million IT specialists (Grzegorczyk, 2022).

A comprehensive view of information on computer skills in the European Union is provided by the Digital Economy and Society Index (DESI). The Digital Economy and Society Index (DESI) summarises indicators of Europe's digital performance and tracks the progress of EU countries (European Commission, 2022). The paper aims to describe the position of IT specialists and analyse the situation in the labour market in Slovakia and the countries of the European Union from the point of the number of IT specialists with the use of data from DESI.

2. DATA AND METHODOLOGY

In our article, we focused on the DESI sub-dimension of advanced skills and development consisting of 4 indicators. The purpose of our analysis is to evaluate the development of indicators in all EU countries. The data source was the DESI database, in which the majority of the included indicators come from Eurostat. All monitored indicators are part of the database available in the time horizon 2016-2021. To assess the change in the time series of indicators between countries, we chose the compound annual growth rate, which takes into account the change in value in marginal years recalculated on an annual basis. To avoid different units of measurement, we used standardized values. The hierarchical clustering was applied to identify groups of countries with similar values of indicators in the marginal years of the time series. Ward's method based on squared Euclidean distance was applied for both monitored years 2016, and 2021. We have determined the optimal number of 6 clusters, in terms of a simpler and clearer comparison of the countries regrouping in individual clusters, as well as compliance with methodological principles.

3. RESULTS

The European Commission has monitored Member States' progress on digital transformation and published annual Digital Economy and Society Index (DESI) reports since 2014. In 2021, the Commission adjusted DESI to reflect the two major policy: The Recovery and Resilience Facility and the Digital Decade Compass. In the last edition in 2021, the Commission made a number of changes to improve the methodology according to the latest technological development. DESI has four main dimensions now:

1. Human capital,
2. Connectivity,
3. Integration of digital technology,
4. Digital public services.

For our paper, we used data from the first dimension – Human capital. This dimension has two sub-dimensions covering internet user skills and advanced skills and development. For detailed analysis we chose the sub-dimension of advanced skills and development. This sub-dimension has four indicators: ICT specialists, Female ICT specialists, Enterprises providing ICT training and ICT graduates. A complete comparison for EU countries is shown in Table 1.

Table 1. Advances Skills and Development score for European Union countries

Advanced Skills and Development score				ICT Specialists		Female ICT specialists		Enterprises providing ICT training		ICT graduates	
Country	Ranking 2021	Score growth	score CAGR*	Country	Score CAGR*	Country	Score CAGR*	Country	Score CAGR*	Country	Score CAGR*
LT	21		6,2%	LT	9,5%	EL	11,0%	PL	9,1%	PT	13,9%
EE	3		5,8%	*SK*	*8,4%*	LU	8,0%	LV	6,3%	LT	12,0%
SK	*23*		*5,2%*	EE	8,1%	AT	7,3%	NL	6,0%	NL	10,1%
PL	27		4,9%	HR	6,5%	*SK*	*5,8%*	LT	5,1%	HU	9,6%
NL	7		4,9%	PT	5,9%	FR	4,9%	IT	4,8%	EE	9,0%
PT	18		4,5%	FR	5,8%	NL	4,8%	EE	4,5%	BG	8,2%
LU	6		4,4%	LV	5,7%	PT	3,7%	SE	4,4%	IT	7,6%
SE	2		3,7%	PL	5,5%	BE	2,9%	CZ	2,5%	IE	7,6%
EL	26		3,7%	DE	4,9%	LT	2,8%	MT	2,5%	LU	6,8%
FR	17		2,9%	RO	4,8%	DK	2,5%	RO	1,9%	*SK*	*6,1%*
CZ	22		2,9%	LU	4,7%	SE	2,4%	CY	1,8%	HR	5,9%
HR	16		2,9%	IE	4,4%	**EU**	**2,3%**	DK	0,6%	PL	5,6%
IE	4		2,7%	SE	4,2%	PL	2,0%	HU	0,5%	**EU**	**4,0%**
IT	28		2,7%	**EU**	**4,2%**	DE	1,4%	PT	0,4%	SE	3,6%
EU	**14**		**2,6%**	ES	4,2%	IT	1,3%	BE	0,3%	CZ	3,5%
DK	5		2,5%	SI	4,1%	SI	1,3%	FI	0,1%	BE	3,1%
BE	9		2,5%	CZ	3,7%	EE	1,1%	**EU**	**-1,0%**	RO	3,1%
HU	25		2,5%	DK	3,6%	ES	1,0%	ES	-1,5%	FR	3,0%
FI	1		2,0%	BE	3,5%	HR	1,0%	HR	-1,5%	FI	2,3%
ES	15		1,5%	FI	3,5%	CZ	1,0%	SI	-1,9%	DK	2,2%
LV	13		1,4%	NL	3,4%	FI	0,9%	IE	-2,4%	LV	1,9%
RO	20		1,4%	EL	3,3%	IE	0,6%	*SK*	*-2,7%*	ES	1,0%
SI	11		1,3%	MT	3,0%	HU	0,3%	LU	-3,4%	DE	0,5%
DE	8		1,1%	CY	2,8%	RO	-0,8%	BG	-3,6%	AT	0,0%
BG	19		0,9%	BG	2,6%	BG	-1,4%	EL	-4,1%	SI	0,0%
AT	10		0,2%	AT	2,4%	CY	-2,7%	DE	-4,4%	CY	-3,7%
CY	24		-0,4%	IT	2,4%	LV	-2,8%	FR	-6,9%	EL	-5,0%
MT	12		-3,0%	HU	1,1%	MT	-8,3%	AT	-11,8%	MT	-9,0%

* CARG - Compound Annual Growth Rate
ICT specialists, Female ICT specialists - percentage of total employment.
Enterprises providing ICT training - percentage of enterprises.
ICT graduates - percentage of graduates.

Source: European Commission, 2022, own processing

We calculate compound annual growth rates for EU countries for the comparison of data from 2016 with the year 2021. According to our results, the best growth score has Lithuania. The second one is Estonia and the third one is Slovakia. An interesting fact is that Slovakia's ranking in DESI index generally is 23rd position among EU countries. The countries with the best DESI ranking are Finland, Sweden and Estonia but these countries are not the best in this sub-dimension. To countries with the worst score belongs Malta, Cyprus and Austria. Slovakia recorded a significant increase in the indicator ICT Specialists and Female ICT specialists. The increase in both indicators may be due to a growth in the number of job offers as well as a rise in salaries in these positions. On the contrary, a significant decrease was noted for the indicator Enterprises providing ICT training. Slovakia ranking for this indicator is in 22nd position. The decline in this indicator may be due to the occurrence of the corona crisis in recent years. Many companies in Slovakia had a problem with the payment of employee salaries, which led to cuts in some areas. Staff training was one of these areas. An increase was also recorded for the indicator ICT graduates. This may be due mainly to labour market requirements for filling IT positions.

For a more detailed view of the countries in this sub-dimension, a cluster analysis was also performed. The year 2021 was chosen for comparison, for which we have the latest available data, and the year 2016. Although DESI has been measured since 2014, there have been changes in dimensions in the following year, and a steady number of dimensions arose in 2016. The inclusion of countries in clusters is presented in Figure 1.

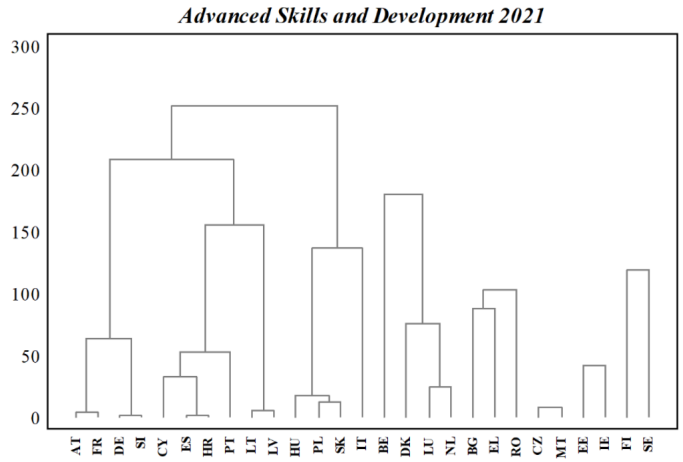

Figure 1. Cluster analysis 2021

Source: European Commission, 2022, own processing

The results of cluster analysis for the year 2021 show that we identify six homogenous groups of cases. A list of countries that belong to these clusters is shown in Table 2. Finland and Sweden belong to cluster 6. These countries are in the first two positions of the DESI index ranking. Interesting is the high number of ICT Specialists in these countries. The highest number of Female ICT specialists is in the countries that belong to cluster 3 – Belgium, Greece and Romania. Countries from cluster 6 also have great numbers of indicator Enterprises providing ICT training. The highest number of ICT graduates have the countries in cluster 5 – Greece and Ireland. Slovakia belongs to cluster 1.

A complete comparison is presented in Figure 2. To better show the changes in the data in the sub-dimension Advanced skills and development, a cluster analysis was also performed for the year 2016. The inclusion of countries in clusters for 2016 is shown in Figure 3.

Table 2. List of countries that belong to the clusters in 2021

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
AT	BE	BG	CZ	EE	FI
CY	DK	EL	MT	IE	SE
DE	LU	RO			
ES	NL				
FR					
HR					
HU					
IT					
LT					
LV					
PL					
PT					
SI					
SK					

Source: European Commission, 2022, own processing

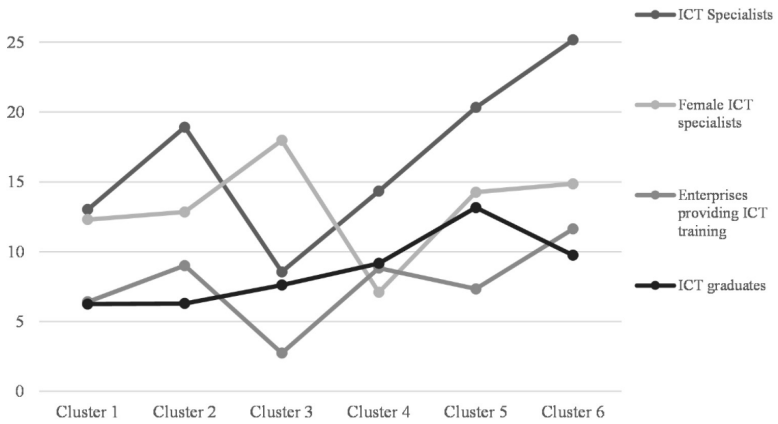

Figure 2. Cluster centroids 2021

Source: European Commission, 2022, own processing

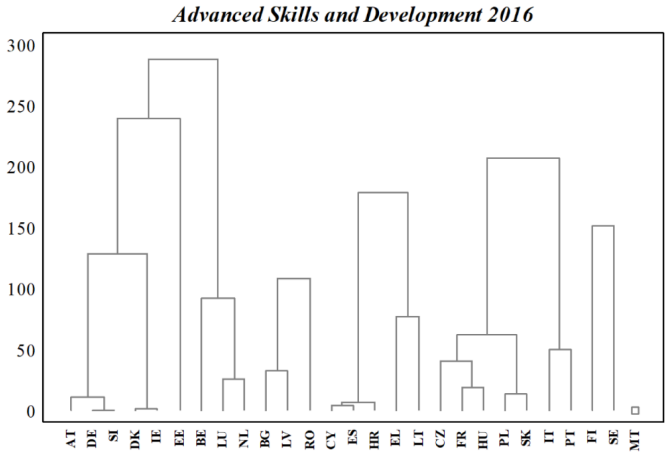

Figure 3. Cluster analysis 2016

Source: European Commission, 2016, own processing

The results of cluster analysis for the year 2016 show that we identify five homogenous groups of cases and one country was identified as an outlier. Outliers are not similar to normal data points in a dataset. They are rare data points far away from regular data points and generally do not form a tight cluster. As outlier was found Malta. Countries that belong to these clusters are presented in Table 3.

Table 3. List of countries that belong to the clusters in 2016

Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Cluster 6
AT	BG	CY	CZ	FI	MT
BE	LV	EL	FR	SE	
DE	RO	ES	HU		
DK		HR	IT		
EE		LT	PL		
IE			PT		
LU			SK		
NL					
SI					

Source: European Commission, 2016, own processing

To cluster 5, belong Finland and Sweden again. The change is in countries that are in the first two positions of the DESI index ranking in 2016. The first country in the ranking was Denmark and the second was Finland. Countries in cluster 5 (Finland, Sweden) have the highest number of ICT specialists. The highest number of Female ICT specialists is in the countries that belong to cluster 2 – Belgium, Latvia and Romania. Countries from cluster 5 also have great numbers of indicator Enterprises providing ICT training. The highest number of ICT graduates has the country in cluster 6 – Malta. Slovakia belongs to cluster 4. A complete comparison is shown in Figure 4.

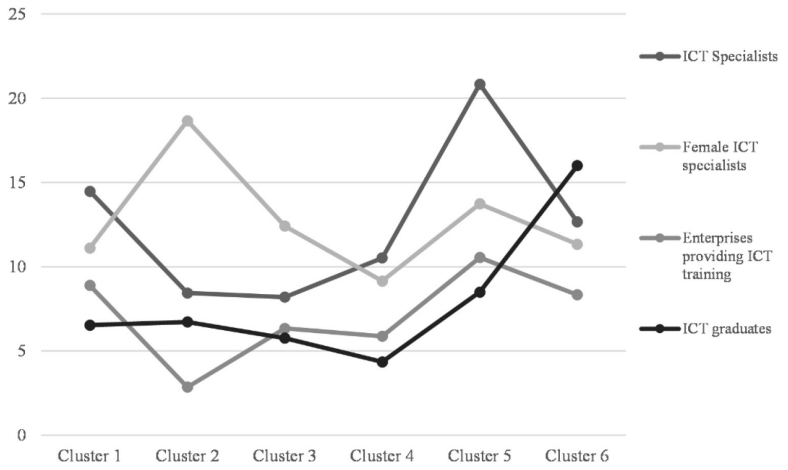

Figure 4. Cluster centroids 2016

Source: European Commission, 2016, own processing

4. DISCUSSION AND CONCLUSIONS

The introduction of new technologies and digitalisation is having an impact on society through changes to the way that people live, work or interact with one another. Significant changes have occurred, especially in the labour market. "Despite rapid growth in the ICT sector, creating some 120,000 new jobs a year, Europe could face a shortage of more than 800,000 skilled ICT workers by 2020" – this statement is from the article by Fadilpašić (2015). This situation has not changed significantly over seven years and we still have a shortage of IT specialists. Based on data from the DESI index, which measures the level of digitization in EU member states, there has been a shift towards better. In Slovakia, data from compound annual growth rate shows, that we have growth in the number of ICT Specialists. Slovakia is in second place in this indicator compared to other EU countries. Good placement - fourth place - was also recorded in the indicator Female ICT specialists. A significant problem was noted in the training of employees

in companies. Slovakia is in the 22nd position. Complications in employee training could also be caused by the corona crisis during which there was a decline in training activities. However, the increase in the number of IT graduates is positive, and Slovakia is in the 10th position. The increase in the number of graduates is a consequence of the requirements of the labour market for IT positions. According to the Slovak job portal Profesia (2021), the number of job offers in IT is the highest in history. The results of the cluster analysis for 2021 also confirm that Slovakia is included in the group of countries with low values of the indicators of the analysed sub-dimension Advanced Skills and Development. The importance of ICT tools is also emphasized by the research of Cette et al. (2021). The employment of ICT specialists and the use of digital technologies improve a firm's labour productivity by about 23% and its total factor productivity by about 17%.

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Impact of Information Technology Tools on Business Decisions Making in the Organization

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Abstract: *Frequent and difficult to predict changes in the business environment require faster and more efficient decision-making, which requires a large amount of information, and their collection and interpretation require modern information technology. Inefficient use of information technology tools often results in inadequate business decisions.*

This paper aims to determine the contribution of information technology in decision-making in organizations. The subject of research is the analysis of the importance, role and application of IT tools in decision-making. In the research work, desk and field research of companies were used, as well as research methods following previous scientific theories. The authors assume that IT tools are insufficiently and inadequately used in making business decisions. The authors proposed models for establishing optimal information capacities, in accordance with the characteristics and needs of companies.

1. INTRODUCTION

Business decision-making is one of the most important factors in the business of any company or organization. Decisions are made at different levels. Some are at the strategic and some are at the operational level. It is important that they are correct and that they are delivered on time. In today's turbulent environment, quick reactions to new circumstances are often necessary. In order to make adequate decisions, timely and quality information is needed.

Information technology cannot make decisions for the manager of the organization but allows the manager to have fast and reliable quantitative information about the business in order to make decisions. For example, information technology can be used for "what if" simulations. Electronic spreadsheets can store all known information about, for example, prices and the impact of prices on products. Different price assumptions can be entered in a calculation spreadsheet that "models" different pricing strategies. This is a much faster and cheaper technique, instead of really changing prices to see what happens (Okeke, 2010).

In modern business conditions, it is difficult to make the right decisions without the support of information technologies. Information technology is used in almost all forms of technology, that is, any equipment or technique used by a company, institution or any other organization requires dealing with information. Every company needs information. As society develops, the amount of information necessary for the business is growing. Information is needed for planning, control, decision making, communication, organization and management. This can be achieved through the use of "Management Information Systems (MIS), Electronic Data Processing (EDP), Office Support System, Data Processing System and Decision Support System (DSS)" (Okeke, 2010).

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Some jobs, such as accounting, data processing, modeling, construction, forecasting, business decision making, etc. are inconceivable without the use of modern technologies. This allows companies significant savings and thus better positioning in the market. Modern technologies include a complex network of computers and telecommunications technologies and related software and operating system. In addition to the above, information technology includes the knowledge needed to manage computerized systems.

Several types of information systems are used in business decision-making. Some of them are intended to help managers make decisions by providing them with relevant information and data, and some information systems even make their own decisions, especially when it comes to programmed decisions, that is, where the decision-making process does not change.

2. RESEARCH METHODOLOGY

This paper explains the importance of business decision-making, and information systems, as decision support tools. Different desk researches of companies were used, sorted according to their size, type of activity and decision-making levels. What all companies have in common is that they need IT tools to make quality decisions.

Research hypotheses have been set as follows:
- For making quality business decisions in modern business conditions, it is necessary that companies use adequate information systems and have trained staff to use them.
- Companies that have built an integrated information system to support business decision-making are more competitive in the market.

3. LITERATURE AND PROBLEM STATEMENT

Companies face everyday problems in their business. The application of information technologies in the business of the company contributes to their solution and achievement of the strategic goals of the company. The emphasis in the paper is on the problem of managerial decision-making, as well as on the study of decision support systems.

There are three aspects of decision-making:
- decision making from the aspect of the problem (1),
- decision-making from the aspect of the subject (2), and
- decision-making from the aspect of decision-making methods (3)

(1) When it comes to decision-making from the aspect of problems, there are programmed and unprogrammed decision-making. Programmed decisions are made in situations that have occurred often enough that they can be used to make rules that will apply in the future. This method of decision-making is characteristic of decision-making at lower levels.

Unprogrammed decisions are mostly unstructured and have significant consequences for the organization. They are brought to new problems and in solving complex situations. They are mainly related to strategic decision-making (Daft, 2008).

(2) Decision-making from the aspect of the subject can be group or individual. Individual decision-making is usually simpler and faster, and one person is responsible for the consequences.

In group decision-making, decisions are made by a large number of individuals who work as a group to solve a problem, such as decision-making of the shareholders' assembly, supervisory board, group of managers, employees, etc. This form of decision-making usually takes longer than individual decision-making.

When it is best to use individually and when group decision-making depends on:
- types of decisions made,
- knowledge and skills of decision-makers,
- the time available to decision-makers, and
- type, i.e. category of the decision-making process (Moorhead & Griffin, 1989)

(3) Decision-making from the aspect of decision-making is a sum of three factors: intuition, judgment and rationality. Accordingly, it can be divided into: intuitive decision-making, judgment-based decision-making and rational decision-making.

As shown in Figure 1, decisions can be (Bulat, 2004):
- Strategic decisions. They are brought by top management and have long-term consequences;
- Tactical decisions. They ensure the implementation of strategic decisions. They are expected to increase the efficiency of the company.
- Operational decisions. They are brought by first level managers. In this way, a basis is created for the realization of obligations and changes initiated by higher levels.

As a rule, operational decisions are made intuitively, tactically based on judgment, and strategic decisions rationally (Mescon, 1985, Weihrich, 1998).

Figure 1 shows the relationship between managerial levels and managerial decisions.

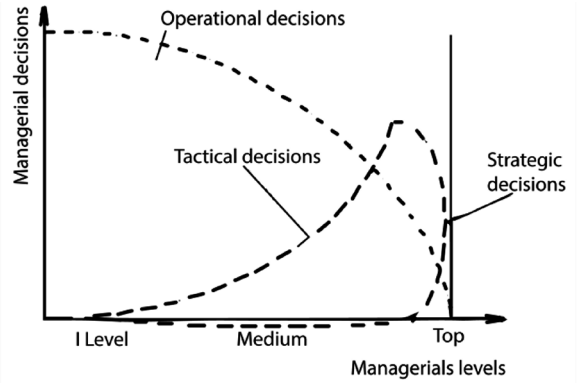

Figure 1. Managerial decisions by level depending on the character (strategic, tactical and operational)

Source: Bulat, 2004.

The modern business environment requires new skills from managers combined with expertise in the field of IT. Such a manager should (Marković Blagojević, M., 2014):
- define the information systems (IS) strategy in the company,
- identify the need for IS to improve the company's performance,
- select and procure the appropriate IS,
- oversee the development and implementation,
- manage IS to ensure effectiveness in providing quality information to the final user.

4. DECISION SUPPORT SYSTEMS

As a result of theoretical research on organizational decision-making during the early 1960s and as a result of working with computer systems in the mid-1960s of the last century (Power, 2000), the concept of decision support systems emerged.

The components of the decision support system are:
- The data management subsystem consists of the following elements: decision support system databases, data management systems, data directories and queries.
- Model management subsystem, that consists of elements: model databases, model database management systems, model directories and command processors.
- Knowledge management subsystem: Intelligent Decision Support Systems (IDSS), Knowledge-based DSS.
- User, and
- Subsystem - user interface: Represents the way the program (in this case the operating system) communicates with the user. It consists of the following components: user interface management system, natural language translation units, terminals, printers, plotters, etc.

The connection between the listed components of the user interface is presented in Figure 2.

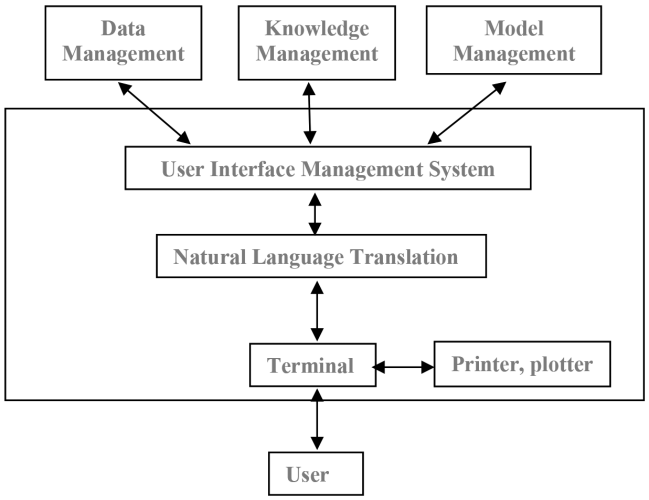

Figure 2. Subsystem structure - user interface
Source: Turban & Aronson, 1998.

5. DISCUSSION

Until the advent of information technology, most organizations did data processing manually, which led to operational inefficiencies and many weaknesses, such as (Okeke, 2010):
- Waste of time,
- Duplicate effort,
- High operating costs,
- High workload of employees,
- Low customer satisfaction,
- Collected information can be easily lost due to the archiving system,
- There is a problem with the interconnection and transfer of information between different departments of the company.

Delays in the introduction of new technologies and staff training reduce the competitiveness of companies. Increasingly fierce market competition has influenced companies to increasingly use information technology (IT) in their business. They are an integral part of business today.

In order to use IT effectively, employees are required to be computer literate. By using IT, many spatial constraints are removed and presence and business in remote parts of the world are allowed.

Although modern technologies are available to companies in recent times, a significant part of companies, especially small and medium-sized ones, do not sufficiently use the possibilities of modern information technologies, which often results in inadequate business decisions. For this reason, awareness of the need to use information systems is growing significantly, and more and more is being invested in information technology, which increases the need for quality management of IT and IT projects.

The use of Decision Support Systems (DSS) has the following advantages (Power, 2000):

1) Increasing the individual efficiency of decision-makers in terms of better data management and shortening the time required to complete the task,
2) Expediency in solving problems,
3) Facilitating mutual communication,
4) Better connection with partners,
5) Promotes learning and exercise,
6) Strengthens control in the organization,
7) Improved quality of services to customers,
8) In conditions of unpredictable changes, it is often necessary to change goals quickly, which requires IT support.

6. CONCLUSION

The development of technology has enabled the development and implementation of modern information systems. The purpose of any information system is to provide information for its use for different purposes. The development of information systems includes certain steps and phases. One of the most important phases is the modeling of the information system and its subsystems, which must be approached in a planned manner.

The components of the decision support system are the data management subsystem, model management subsystem, knowledge management subsystem, user interface subsystem, and user.

According to one classification, the most important subsystems include information subsystem of production, information subsystem of marketing and sales, information subsystem of finance and accounting, information subsystem of human resources. The organization of the business system mainly determines the organization of the information system.

The research of the authors of the paper shows that in the decision-making process, IT tools are not used to a sufficient extent and are often not used adequately. In the decision-making process, managers identify and choose solutions and activities that enable the achievement of desired goals. They usually opt for one of the alternatives.

Great attention is paid to business decisions because the quality of decisions is directly related to business success. Decisions are made daily and at all levels in the company, but the most important are strategic decisions made by top managers. The decision-making process goes through several interrelated steps, i.e. phases.

A prerequisite for making a quality business decision is the possession of adequate information, where the role of IT tools has no alternative. When gathering information, problems are often present, such as information saturation and ranking of the results found. The Internet is becoming the most important source of information.

Research in this paper shows that successful companies pay significant attention to the development of integrated financial systems in order to support the business decision-making process. They have built an integrated information system that they use. In that way, they are better profiled on the market.

Likewise, companies that are competitive in the market invest significant resources in lifelong learning, especially in the development of information literacy. This proves the hypotheses of this paper.

Based on the results of the research, the authors suggest that companies monitor and anticipate changes in the environment and react to them on time and make appropriate decisions. At the same time, it is necessary to introduce integrated information systems that will help them make timely, high-quality and efficient decisions.

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Strategic Management for the Realignment of Risk Determination of the Supply Chain in Electric Car Production

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Supply;
Environmental and demand risks

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Abstract: *Automobile mobility has been following a new path for years with the electrification of drive-through battery energy and will replace fossil drives in the foreseeable future. Restructuring the existing processes to implement the technical requirements is a challenge for the established OEMs, who must establish new value chains in addition to the existing ones. The established OEMs are thus challenged to configure a management system in their strategic planning that meets the future requirements and allows them to remain competitive. Ultimately, however, the customers are the most important factor, as all planning and degrees of fulfillment are oriented towards them. The key question is thus: How can OEMs strategically align their value chains, taking all factors into account so that they are considered resilient and robust? As a factor of the possibilities of strategic alignment of value chains, the EU project 'GAIA-X', which is currently being developed, is considered in this paper.*

1. INTRODUCTION

The automotive industry has been in the process of completing the transition from a fossil-dominated drive system to alternative drive systems for about ten years. In the process, a current core solution has established itself in the form of the battery-supported electric drive, which is used by both OEMs and pure-electric players (cf. vom Hemdt, 2019, p. 4). However, even after ten years, OEMs in particular still face considerable problems in designing their value chains in such a way that they can be determined as fully resilient (cf. Falck/Koenen, 2019, p. 3). This makes existing value chain systems more vulnerable to risks from a wide range of areas that affect these chains. OEMs must aim to make the entire value chain more resilient and better protect themselves against risks. To achieve this, however, the companies must have a transparent knowledge of the entire value chain so that there is also management within the chain, its interfaces and the perceivable problem areas that make these factors more robust (cf. EY, 2019, p. 29).

A fundamental issue for the OEMs lies in the areas of competence that are revealed by a restructuring of the automobile in the energy carrier component battery and the differently structured powertrain. These components are not considered core competences of the OEMs, which have so far relied on combustion technology but are now forced by external pressure from society, politics and newly developing or already established competition in the form of pure-electric players to follow the market development.

However, a focus on electromobility requires new conditions in the value chain, which is structured differently than was previously the case with combustion engine technology. This new

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structure, with all upstream and downstream areas, is presented in the following diagram. The elaboration of strategic management in this article focuses on the areas A1; a1 - B2; b2 - C3; c3 - 7 and the regulatory framework. They define themselves in problem determination as the main factors for the OEMs in the area of readjustment and adjustment for risk management.

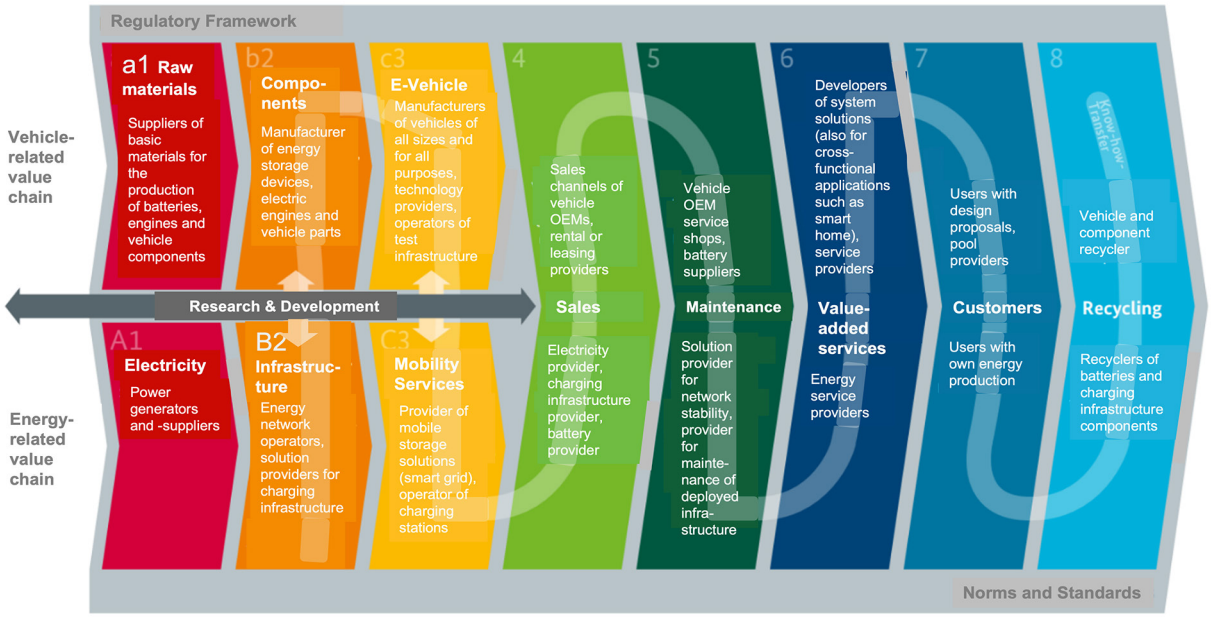

Figure 1. Complete supply chain of the electric car industry

Source: German Federal Ministry for Economic Affairs and Energy, 2016, p. 8

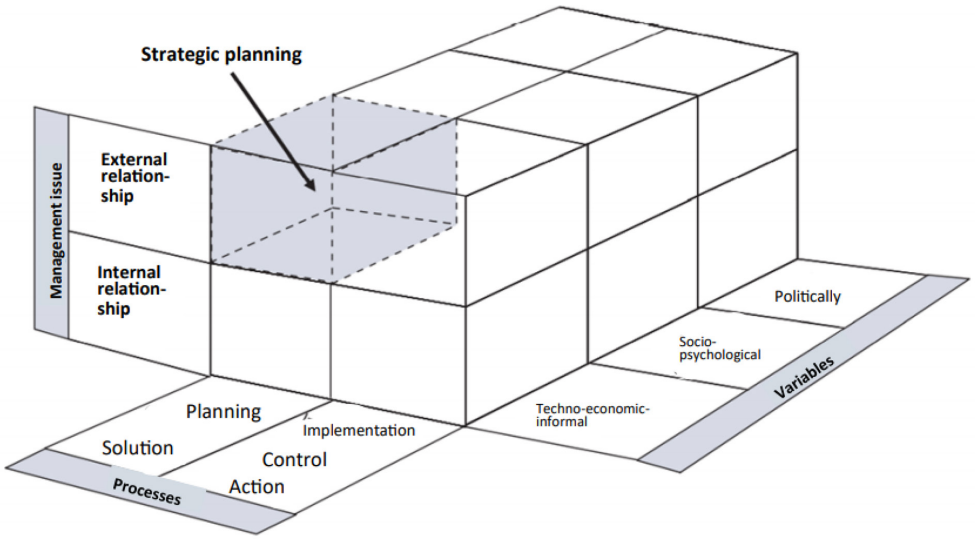

Figure 2. Strategic planning as a component of overall strategic management and the existing influencing factors and variables.

Source: Ansoff et al., 1076, p. 2; in: Welge et al., 2017, p. 14

Although a repositioning has already taken place in parts and numerous models have already entered the supply market, numerous international, intranational and national changes and demands have brought about movements in the transformation to electric automobility that particularly affect the OEMs and generate a need for action. Therefore:

> "Economic, technological and demographic change is predictable and transforms the environment of automotive companies. Change can open opportunities, but also poses strategic

risks - especially economic, technological and demographic, as well as political and customer-related risks. Automotive manufacturers and suppliers must therefore look for strategies to best deal with these environmental changes." (Proff/Proff, 2013, p. 63).

The complexity and the existing possibilities of interactions were mapped by Ansoff et al. as early as 1976 in a clear model that also applies to the automotive industry.

Because the automotive industry is of great importance to many national economies (cf. Puls/Fritsch, 2020, p. 12f.), it is important to create a manageable solution for the whole European OEMs.

2. SUPPLY RISKS

The requirements of new suppliers and component manufacturers and suppliers go hand in hand with the changeover of energy generation in the automobile through the battery and a new powertrain based on electric energy generation.

However, the core technology of electric automobility is almost unanimously seen in battery technology, which requires other raw material components and need not be seen as the core competence of OEMs (cf. Kampker et al., 2018, p. 48). This is where battery manufacturers are required, not necessarily part of the corporate structure, but to act as partners.

In the meantime, some OEMs have started to include their production in the group structure, which simplifies the adjustment of technical requirements (size, compatibility, performance requirements, etc.). The increasing captive demand of the markets in China, Japan and South Korea will reduce the willingness to pay high export rates in the event of rising demand, or possibly cause battery prices to rise for European OEMs (customs duties, levies, etc.). The current supplier structure internationally is as follows.

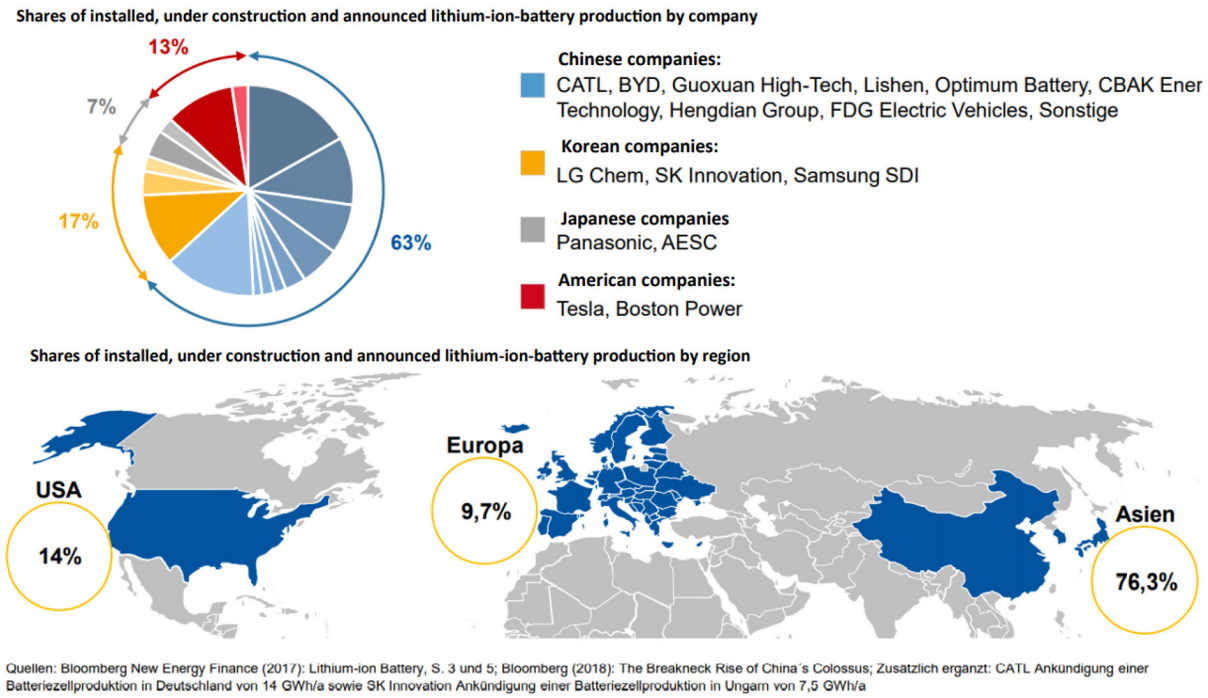

Figure 3. Distribution of battery producers by company and region

Source: Vom Hemdt, 2019, p. 5

Therefore, planning is geared towards own battery production, which requires an additional strategy in the procurement of raw materials. This is the real problem area of battery technology - the availability of necessary raw materials needed for manufacturing. Lithium and cobalt are the raw materials with the highest risks for availability for production. In addition, with the extraction of raw materials in the Congo as the largest producer of cobalt, the extraction methods are considered politically critical (cf. Falk/Koenen, 2019, p. 17). This collides with the political requirements through compliance with humane working environments and sustainability in connection with the Supply Chain Act.

However, forecasts for the availability of primary lithium and cobalt vary widely (cf. Leifker et al., 2018, p. 27f./Ames/Schurath, 2018, p. 2). Some researchers believe that the quantities for the automotive industry are sufficient to cover a long-term demand (cf. Ames/Schurath, 2018, p. 2). This includes the consideration that by increasing recycling, the amount of primary lithium and cobalt can be reduced in the future (cf. Morche et al., 2018, p. 253). Other researchers are more skeptical about resource availability, which is also related to the further development of the needs of other electrical industries. A lot of alternative industries also have an increasing demand for these two raw materials, so the overall calculation should not only be oriented towards the automotive industry. In the case of cobalt, the use is even broader, so that even more branches of industry are competing for the raw material.

The extraction of these two important raw materials as elementary components for battery technology is globally limited to a few regions (cf. Ames/Schurath, 2018, p. 3).

The distribution of lithium reserves in tonnes among the main nations with deposits is as follows:

- Argentina: 9,000,000
- Bolivia: 9,000,000
- Chile: 7,500,000
- China: 7,000,000
- Australia: 2,000,000
- Brazil: 200,000
- Zimbabwe: 100,000
- Portugal: 60,000
- Germany: 60,000

Subtotal: 34,920,000.
Worldwide: 47,020,000.[3]

Since in many of these countries the extraction conditions are considered inhumane and highly dangerous (cf. exaggerated Leifker et al., 2018/Ames/Schurath, 2018), the European OEMs come into serious conflict through the state legislation on supply chain sustainability, which already takes effect in many states. Accordingly, manufacturers are forced to remove such extraction companies or, if necessary, entire nations from their resource portfolios because they do not comply with the legal basis.

For other nations, the dependence on supply is very strong (e.g. China), so competition arises because China has a high demand, which reduces exports (cf. Leifker et al., 2018, p. 10).

3. ENVIRONMENTAL RISKS

The links between new sectors and the automotive industry must also be included in strategic management, as the new technology requires a different energy supply network than was the case with fossil fuels in the form of petrol station operators.

[3] Data: United States Geological Survey 2017; in: Leifker et al., 2018, p. 13)

Electricity grids in Germany are considered to be very well developed and secure. However, with the expansion of electric vehicles, different electricity consumption will emerge, which will place a different burden on the existing electricity grids. The need for transformer stations, larger load capacities of the grids and expanded security models for the grids as critical infrastructures will increase and this development must be supported by the energy providers in the power supply sector (cf. Schill, 2010, pp. 155f.).

Furthermore, grid operators will also be challenged here if they do not act as providers in the same way. The changeover from the previous load capacities will require an upgrade of the grids if electric vehicles continue to increase, so that overloads and outages can be counteracted. For many parts of the country, this will mean a large investment in existing infrastructure that will need to be made on time.

One of the most important infrastructure measures must be seen as the expansion of public charging stations, which has increased in recent years but is still far from user-friendly coverage that raises mobility with electric vehicles to the same level as has happened with the long-established structures of the filling station networks (cf. exaggerated BMWi, 2016).

For the OEMs and the pure-electric players as well, this poses a fundamental problem, as expansive production is only effective if the infrastructure for charging safety also exists. This also determines to a large extent the willingness of customers to switch to an electric car. Reluctance here is not only due to the range technically possible in the vehicle, but also the mobility determination, which is oriented towards these charging possibilities. (See the statement by the head of the VDA Hildegard Müller: https://www.sueddeutsche.de/service/jahreswechsel-autobranche-sieht-hochlauf-der-elektromobilitaet-gefaehrdet-dpa.urn-newsml-dpa-com-20090101-211227-99-511759).

Impetuses and interventions that repeatedly impose adjustment requirements on the entire industry must be given special attention, as compliance violations not only generate monetary consequences but also mean a loss of reputation.

The most serious intervention by the state is the Supply Chain Act, which affects all market sectors, but adds to the problems of building a new and robust value chain during the OEMs' transformation phase.

In addition, there is another problem point that affects electricity producers and all associated industries - ergo also electromobility. The EEG[4] levy is an external price influence that increases energy prices in the field of electricity and power. Such a price influence can have a negative impact on the demand for electric cars, as it means that the alternative demand is not a positive factor. At the same time, taxation and levies on fossil fuels are being tightened to encourage consumers to adopt an environmentally friendly attitude. As a sign, this is counterproductive, as no decision is understood as an added value and benefit.

For OEMs, such developments have a negative impact on the pricing of their electric cars, as the costs are high in the selling price and any reduction due to an increase in sales is neutralized by energy prices.

[4] Renewable Energy Sources Act or **EEG** (German: Erneuerbare-Energien-Gesetz).

Additional pressure for the OEMs arises from the ambitious climate targets set by politicians, which also have a direct impact on the manufacturing requirements of the OEMs. China and the EU in particular have set up regulations that can be seen as a direct intervention in the manufacturer's strategy. The Chinese government has set up the regulatory mechanism by means of a binding quota that states that manufacturers with more than 30,000 cars sold per year must make 8-10% of these cars purely electric. Otherwise, there is a threat of import restrictions and other economic restrictions for manufacturers who do not comply with the quota (cf. Falk/Koenen, 2019, p. 9).

> "In Europe, the European Commission and the European Parliament have created an effective instrument to influence the composition of vehicle fleets and the model strategy of manufacturers with EU Regulation 443/2009. It gives vehicle manufacturers limits for the average CO2 emissions of newly registered vehicles. If these are not complied with, there is the threat of fines in the billions, which are all the higher the further the target is missed. " (Falk/Koenen, 2019, p. 9)"

The regulations are definitely an intervention in the distribution strategy of the OEMs - even if they serve the climate goal - and with all the other risk factors they represent a considerable burden, which for the time being should be seen as taking advantage of the pure-electric players and influencing the market.

Nevertheless, to drive demand for electric cars, the government in Germany has introduced purchase premiums. This takes the following form:

"A purchase premium for the acquisition of electric vehicles is intended to accelerate the spread of electric vehicles in the market. It is granted in the amount of 4,000 euros for purely electric vehicles and 3,000 euros for plug-in hybrids and is financed in equal parts by the German government and the industry with 600 million euros until 2019 at the latest. The electrically powered vehicle to be subsidized must have a list price for the base model of less than 60,000 euros." (BMWi, 2016, p. 7)

To date, however, the measures have failed to provide the push that made the former government's political goals achievable, and by 2020, approximately 300,000 electric vehicles had been registered (see VDA, 2020, p. 124).

4. DEMAND RISKS

Demand effects show up most clearly in two factors, in that customers compare the price and the quality provided for it. However, price is still a demand restraint in the electric car sector, as the cost of a new purchase is still very high. This is compounded by the fact that the mobility performance is very limited, even though the ranges have improved over the last ten years.

This then reveals another factor of the OEMs' model breadth to serve the multitude of segments. Pure-electric players already dominate some of the segments (small cars and mid-size cars), so OEMs should consider which segments they want to occupy themselves and with which approach they want to enter into direct competition. Consequently, the demand market needs to be precisely elicited.

For 2019, Deloitte has surveyed international customer buying preferences for six major demand markets, which can be read in the chart below.

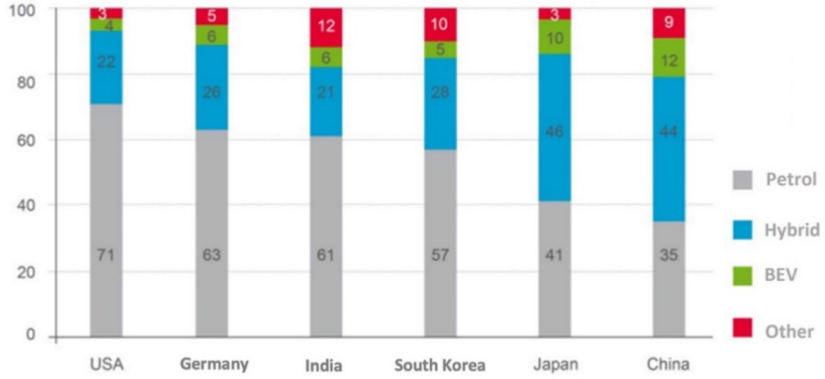

Figure 4. Purchase intention of customers in selected international demand markets regarding their next car purchase, differentiated by drive type (in percents)

Source: Deloitte, 2019; in: ifo Institute, 2019, p. 14

A distinction is made here between four customer groups that can be defined for the field of electromobility:

- Tech-savvy,
- Environmentally conscious,
- Conservatives and,
- Price-conscious customers (cf. Till/Plötz, 2011, pp. 31f.).

Techies are considered enthusiasts when it comes to new tech trends, but they represent only a small proportion of customers.

The customer group of the environmentally conscious is one of the most important groups, as they are considered the largest group. This includes above all the younger customers who will determine the car market by means of demand in the coming decades and who will dominate environmental awareness even more strongly in the process (cf. among others Proff, 2013/Prill et al, 2018).

Conservatives are the customers who are not yet convinced of the possibilities of the new drive technology and would therefore purchase a hybrid engine as the greatest concession. Here, too, there is a large customer group that can only be persuaded to switch by an equivalent alternative in terms of price and mobility comfort.

Customers who can be determined as price-conscious are focused in this segment on obtaining a low-priced variant that comes close to meeting minimum standards. The price is also based on the accompanying costs and follow-up costs that may arise from the purchase.

In general, it should be noted that regardless of the defined customer characteristics, the issue of efficiency in range and thus flexible mobility will be a decision-making moment. Here, research and development in particular are called upon to expand the possibilities that have existed to date. But it is also necessary to adapt the framework conditions that were outlined around environmental risks, as they are just as decisive for mobility.

One of the main questions that OEMs must ask themselves against this backdrop is the breadth of the model range or a gradual orientation that initially focuses on individual segments that are also in demand by most potential customers in order to establish themselves in the new market and make investments profitable.

5. SOLUTION APPROACHES FOR STRONGER RESILIENCE OF THE VALUE CHAIN

An important approach to improving the design of value chains and their resilience is the planning and development of the GAIA-X project. This project was launched by the German Federal Government in 2019 and its structure represents a digital data infrastructure at the EU level that will facilitate the exchange between various relevant areas of science, industry and politics. It is also planned to expand the participation of market participants beyond the European Union (cf. BMWi, 2019, p. 2). The basic idea behind this approach is to prepare companies and the entire European economy more robustly for exogenous and emergent situations and to keep competitiveness stable (cf. Bernhardt/Steininger, 2021, p. 66). In essence, for a concept like GAIA-X, this means not only providing secure data exchange systems but also filling them with content. For the participants, this approach makes information easier to exchange in a central aspect. Voluntariness is in the foreground, whereby it is emphasized that such a transfer of knowledge generates a high added value nationally or intranationally (cf. BMWi, 2020, p. 3). The basic concept can be seen in the following overview and explains which approach is being pursued with GAIA-X.

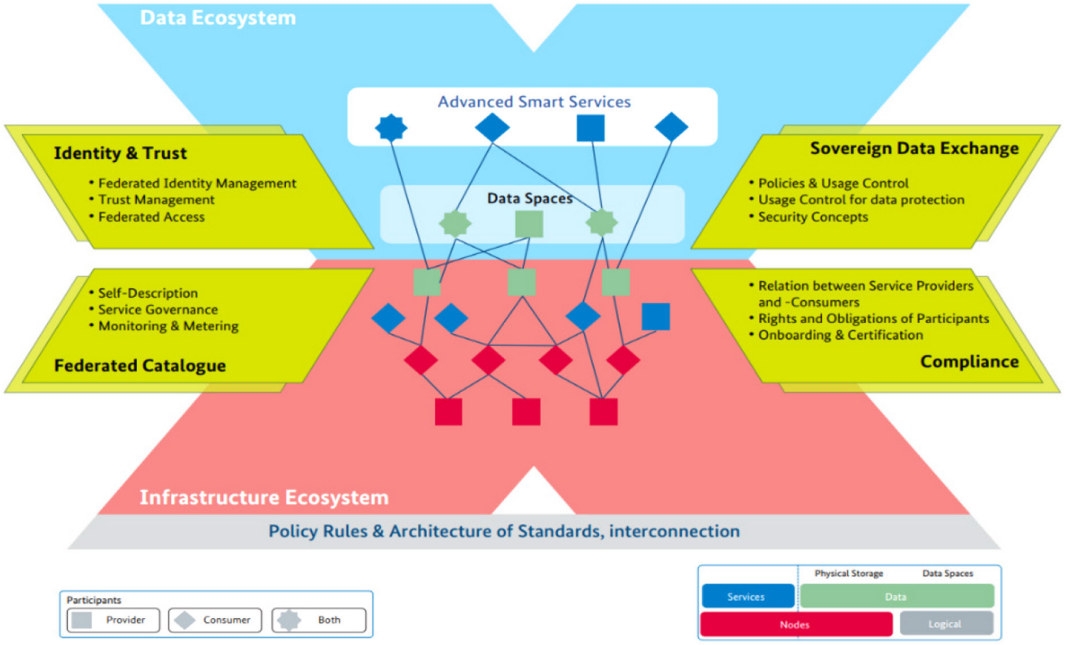

Figure 5. Architecture of the GAIA-X approach at all involved and relevant levels
Source: BMWi, 2020, p. 5

The GAIA-X project is currently (as of February 2022) still under construction. However, the project will soon become fully functional as a future exchange platform and will be freely accessible to all participants in this information infrastructure. The Federal Ministry for Economic Affairs and Climate Protection formulates the objective that a prototype of GAIA-X with the technical core competences will be made available in September 2022 (cf. BMWi, 2022).[5]

In essence, the companies should be able to feed in their own selected data, information and concepts, which can serve as an informational aid for other companies. At the same time, the data and information exchange also offer providers the opportunity to receive adequate data and

[5] This statement was formulated at the request of a member of the German Bundestag to the ministry in a reply letter, which was made publicly available as a pdf document.

information from other partners. Through the exchange, those responsible hope for a higher rate of innovation in existing areas and thus an increase in the efficiency of areas relevant to society as a whole. This also includes the area of mobility. However, exchange hubs are defined for the sectors of health, agriculture, housing, electronics, finance and public administration, which are also used on an interdisciplinary basis (cf. BMWi, 2020, p. 6).

In relation to the automotive industry, which has a high economic power across the EU, such an exchange principle will yield several benefits:

- Possibility of EU standardization of parts and components,
- Delimitations of dependencies of international supply chains,
- Increasing market positioning vis-à-vis strong international competitors,
- Coordinated R&D concepts to obtain further European patents,
- Facilitation of raw material procurement through aggregation,
- More stringent compliance with EU legislation in the value chain,
- Provide standardization for the development of new value chains (electric car technology or, in the future, fuel cell technology),
- Specifications for international participants as a market limiting factor for non-EU products,
- Maintaining unique selling propositions through OEM-specific innovations (in-house core services vs. outsourcing to third parties),
- Lower costs by bundling R&D activities in areas that are not relevant to competition,
- Increasing the market acceptance of electric cars,
- Compliance with the EU directive on CO2 emissions,
- Compliance with supply chain regulations in terms of humanity and sustainability.

Research and development are a time-consuming and cost-intensive process that is carried out by all OEMs and pure players in order to have unique selling points over the competition through innovations. The possibility of an EU-wide standardization of standard parts and components in the production of electric cars offers the opportunity to realign the focus of innovation through the GAIA-X approach. This should be used on the part of the EU as political authority in the form of defining standards. One example would be uniform sub-processes for battery technology production as the core of electromobility. A corresponding standardization would result in market effects that support the OEMs in the technological, strategic and resource-based design of the value chain. Since the focus to date has been on building up the respective OEMs' battery production, a standardization decision in favor of (partial) standards - including the connection and recharging hardware - could accelerate the value chain.

OEMs are forced by legislators in the form of climate targets to establish an electric car value chain, but this involves several problem areas. For example, in addition to climate targets, legal requirements are imposed on raw materials, semi-finished goods and component suppliers in many nations in the form of supply chain laws. The conditions regarding the sustainability and humane working conditions of the extraction of raw materials.

If (partial) battery manufacturing processes were standardized, several conditions on the compliance side could be fulfilled more easily here by pushing ahead with purely European battery production. This reduces dependencies on global suppliers and makes the supply situation more resilient by shortening the supply chain. This also applies to the consideration of raw materials needed for manufacturing. First and foremost, in quantitative terms, are the elements lithium

and cobalt, which are currently the most important core raw materials for battery production and are considered a major problem in the public debate. An overall European solution in this area could curb these problems and simplify the compliance required of OEMs. The basic prerequisite here would be a pan-European mining strategy that considers all relevant legal requirements while providing sufficient raw materials for battery production. With such a large demand market, which also appears to be easier to plan, the raw material suppliers are more willing to fulfill conditions in the interest of the customers (in this case all OEMs with the respective battery manufacturers). A separate mining strategy, as is being pursued by the USA and China geopolitically in various countries, would reduce the EU's dependence and represent a weighty counterbalance to the developing competitors - especially in Asia. With this aggregated supply of raw materials, the pure raw material dependencies in China regarding lithium would also decrease, which would put the competitive situation internationally on a new footing. The current situation of the share in demand-relevant nations of registered electric models on the international market from the perspective of the German OEMs is as follows in 2020:

Internationally registered electric car models (January—June 2020)

Market	Number of models	of which Germans	Share Germans
Belgium	119	59	50%
China	390	31	8%
Germany	106	69	65%
France	164	68	41%
Great Britain	106	53	50%
Japan	44	23	52%
Canada	53	20	38%
Netherlands	126	57	45%
Norway	116	53	46%
Sweden	115	61	53%
South Korea	35	14	40%
USA	49	13	27%

Figure 6. Registrations of electric vehicles in various international markets and German shares in absolute figures and percentages

Source: IHS, Fourin, KBA, Wardsauto; in: VDA, 2020, p. 127

These comparative figures show the markets that must be considered difficult for German OEMs alone to accept (USA and China). The share of electric vehicles in the product range is high in these two countries and is preferred by local customers. By focusing more on other relevant factors of future mobility, European manufacturers can gain an innovative edge here, which will also have a positive effect on registration and sales figures in difficult markets.

As the focus is concentrated on, for example, body technology in the form of lighter composites, sensor technology, energy efficiency or autonomous driving using AI, European OEMs

can focus innovation efforts on future mobility technologies. The expected lead technologies for future mobility are identified by Kuhnert et al. as follows (Kuhnert et al., 2017):

- Electrified: The dominant powertrains will be based on battery technology in the coming years.
- Autonomous: Autonomous driving through AI and interactive sensor technology will make driving more comfortable and safer.
- Shared: The trend will be that cars do not necessarily have to be owned but are freely available through a sharing system and thus subject to demand.
- Connected: The connection of one's vehicle with the outside world will be established in a similar way to the smartphone. There are communication possibilities on all channels. In addition, there will be interaction with the traffic infrastructure in the form of signals, signs and traffic lights to increase safety.
- Yearly updated: Innovation increases are brought up to date through updated infrastructure so that technical digital potentials are installed automatically on a software basis. Hardware components are excluded from this (Cf. Kuhnert et al., 2017, p. 8f.).

In addition, existing battery technologies can be expanded in a targeted manner to achieve range efficiency. This would ensure the further development of battery technology, as even marginal improvements to the basic technology represent an increase in efficiency. This would be the responsibility of university research and battery manufacturers within the GAIA-X structures. This would also allow completely new technical concepts to be included in the project by means of a re-normalization and defined as a new standard.

With such a structure of the value chain, the pricing strategies for electric cars could generate a price advantage that does not need to be supported by state financial subsidies. Purchase premiums, tax benefits and insurance subsidies that currently burden the state budget can be reduced and the market can once again be subjected to market forces. The current state support mechanisms to increase the incentive to buy an electric car are as follows:

- "the extension of the already existing ten-year vehicle tax exemption for purely electric vehicles until 31.12.2030,
- a doubling of the federal government's premiums as a new "innovation premium",
- Research and development in the field of electromobility and battery cell production,
- the modernization of bus and truck fleets with alternative drives, specifically the promotion of e-buses and their charging infrastructure,
- the procurement of municipal commercial vehicles powered by fuel cells, including the necessary hydrogen infrastructure,
- Fleet exchange programs for social services and craftsmen and
- the expansion of modern and customer-friendly charging infrastructure." (VDA, 2020, P. 123).

Some of these incentives and support mechanisms linked to private purchases could then be dismantled or phased out in the foreseeable future.

By shaping a uniform, sustainable and humanitarian value chain of battery technology, the acceptance of buyers would additionally increase, as moral, financial and mobility concerns are increasingly reduced. More sales of electric cars therefore also have a pull effect on the expansion of the charging infrastructure and the efforts to achieve the climate targets.

6. STRATEGIC REALIGNMENT OF SUPPLY CHAIN MANAGEMENT

The comprehensive approach to the consideration of strategic management according to Ansoff shows that the inclusion of external parameters and indirect parameters as influencing factors has transformed the planning concept into a defined management function. This is pursued with an integrative approach. All available information from the areas of the value chain is collected, evaluated and forwarded as relevant information to the responsible management areas. This is not to be viewed in isolation but is incorporated into an overall concept as integrative management. The respective influences on the internal areas, the external tangent points (suppliers, service providers, etc.), the indirect influencing factors (technical development, social attitudes) and the political provisions are all considered. Since this comprehensive information base enables each company to adapt its own decisions to the requirements, it is no longer a pure planning concept but a management function. In a continuous process of adaptation and improvement, the factors are explicitly recorded and implemented in the relevant areas of the processes. This implementation presupposes a certain number of modifications to the company's own existing corporate philosophies and its strategic planning in order to create the flexibility of the company and its processes that can perceive and absorb external relevant factors for the processes. Ansoff formulates five core tasks that are necessary for flexible strategy implementation (cf. Ansoff, 1988, p. 179ff.).

- Development of entrepreneurial capability: Establishment of flat hierarchies and constant direct communication with all relevant actors in the processes.
- Diagnosing general management capability: Determining an existing management culture at the decision-making levels; ability to solve problem factors; involvement of employees and their know-how; functional factors in the company; knowledge stocks, knowledge documentation and knowledge utilization; efficient use of resources in the company.
- Planning strategic posture transformation: By identifying and perceiving relevant factors (internal as well as external), build a management structure that enables adaptation and improvement at relevant points and in processes.
- Assuring coexistence of competitive and entrepreneurial activities: Differentiate between operational goals and strategic goals and then combine them in a further step in order to check, adjust, implement and control operational goals for their implementation based on strategic factors – continuous improvement process.
- Approaches to managing discontinuous change: Preventive approach to change. Communicate change requests to all employees and departments at an early stage. Seek cooperation with employees, identify resistance, create solutions in cooperation, and develop conflict and crisis management internally to absorb internal resistance and resolve it as positively as possible.

These tasks must be redefined and brought to a resilient level, especially in the current situation for OEMs, as a new value chain is emerging with electric automobility. In 2016, the German Federal Ministry for Economic Affairs and Energy emphasized in this regard:

"New technologies and data-based business models are being implemented in globally networked planning and production processes. Electromobility generates competition – new vehicle, component and battery manufacturers are changing global value creation relationships. To remain competitive, market players must optimize the production processes used, make the individual production steps more efficient, and generate synergies in the value chain. In the process, procurement and supply chains are being subdivided and organized in a decentralized manner." (BMWi, 2016, p. 8).

Internally, this value chain places immense demands on the company itself (new suppliers, new processes, determination of new supply chain uncertainties and risks, new training and development requirements for existing staff). But there are also external demands on the OEMs, which are formed socially, politically/legally and resource-oriented (suppliers).

In the case of electric automobility, however, the requirements go even further beyond these areas. The close traditional link between the automotive industry and fuel producers and distributors is being replaced by a new necessary link. The new 'fuel' is electrical energy provided by other suppliers. Since these connections have acted in a disconnected manner, the infrastructural conditions regarding charging infrastructure have not developed congruently with the OEMs. The requirements for an area-wide charging infrastructure still lag far behind the required capacities and indirectly put pressure on the OEMs. The end customer decides with his purchasing behavior whether and when he/she will buy an electric car. Negatively, customers perceive currently too little charging capacity to satisfy their mobility demands. With regard to these aspects, GAIA-X can free up deployed capacities, enable consolidated planning structures and integrate new management strategies.

The following table gives an overview of the potentials that are possible through the implementation of GAIA-X nationally and EU-wide. The parameters selected are based on Ansoff's strategic management approach and include both internal and external management approaches. Likewise, the process design options and the political, social and technical-economic variables are included so that the interactions of all parameters become clear.

	Internal relationship	External relationship	Processes along the SC	Politically	Socio-psychological	Techno-economic-informal	European development in automobile industry
GAIA-X-Projekt	♦Standardization reduces the production effort	♦OEMs and Pure-Electric manufactures have continuously unique selling points	♦Batteries can manufactured uniformly in these technical parameters	♦Reduction of the CO2 values according to legal requirements will be lowered immanently in the coming years	♦Motivation of buyers' ecological conscience —> Incentive to buy	♦Promotion of the patent rate in Europe	♦Asian and US markets as pure electric players are strong competition
	♦Differentiation possibilities of the OEMs —> Model range are promoted	♦R&D remains a unique selling proposition for each OEM	♦European battery production more resilient and more robust in the supply chain	♦Supply Chain Law compliance	♦Demand for lowering the costs for e-cars —> Price level of fossil drives	♦Product piracy and black market trading are made more difficult	♦Job security by more intranational production
	♦High willingness to participate an -X project	♦This includes: Technical additional services, services, designs, bodywork	♦Detachment from international providers	♦Promotion of local projects —> Social promotion		♦EU standards for generally similar components in all models	♦Optimizing the supplier industry for the new pure electric supply chain (promotion of intranational companies)
	♦Importance of safeguarding the interests of the founding members or the new members	♦Subcontracting open to more suppliers —> Competition		♦Basis: European raw material strategy for battery production		♦Innovations from GAIA-X influence future standards	♦Standardization of the technical parameters of the battery as an important approach
		♦International providers (outsourcing) only by complying with the specified standard		♦Development of European mining strategies			♦Continuous expansion of the charging infrastructure and ensuring a close-knit-network of providers
		♦GAIA-X is pushing the expansion of the charging infrastructure		♦National concepts are reduced in favor of European ones			♦Exports of European OEMs competitive and further promoting intranational competition
				♦Quality standards due to mandatory standards for international suppliers			♦Compliance with labour and working conditions laws must be complied with internationally

Figure 7. Parameters of possible positive changes in the automotive industry in Europe through the GAIA-X project

Source: Own design, 2022.

In addition, the factor of Europeanization of the industrial orientation at the OEMs was added, which is necessary to consider the automotive market as an overall European market, which enters into direct competition with the markets in Asia and the U.S. market. The prerequisite is that the individual competing OEMs on the continent are prepared to forego areas of individualization in favor of a pan-European market in order to represent a supply force for the entire international automotive market. However, the self-interests are still very much above the overall interests, as the cases in the diesel scandal have also shown.[6] But there is also the other side in the whole picture, which has made it clear to OEMs that partial cooperation in restructuring the entire supply chain can leverage added value.

"The sharply increasing demands that are emerging with the strategic shift toward electric vehicles and the pervasive digitization in vehicles are fostering collaborations among automotive OEMs that were previously unthinkable to the same extent. BMW, for example, is cooperating with Daimler on car sharing and autonomous driving, but the development of joint platforms for future e-models is also under discussion. There are also plans for Ford and VW to collaborate, including Ford's future use of Volkswagen's MEB electric modular system." (Karle, 2020, p. 6f.).

Implementation with GAIA-X would have synergistic effects on sales in competitor markets and at the same time would provide an incentive for international raw material suppliers, and accessory and semi-finished goods manufacturers to cooperate with European OEMs.

This basic consideration of integration into European strategy management is based on the real fear of European OEMs losing important shares of the market for electric cars to Asian and American (USA) competitors (cf. Puls/Fritsch, 2020, p. 5). Here, above all, the availability of batteries and the raw materials required for them represent one of the most important parameters. Without the battery as an energy source and storage medium in sufficient quantities, electrification of automotive technology is unthinkable and requires a clear strategy in the design of supply chains and their processes (cf. Kleine-Möllhoff et al., 2012, p. 4/Hoberg et al., 2010, p. 51).

Ansoff's approach to strategic management applied to the implementation of GAIA-X in the European automotive industry shows opportunities to facilitate the transformation of value chains. The neuralgic points of reengineering with existing and new suppliers, the political influencing factors and the orientation of a stronger intranationalization of market conditions can be positively influenced here, especially with GAIA-X. However, all parameters depend on the further implementations and cooperation of the relevant actors and how the project will continue to establish itself.

All factors, however, are strong in their impact on the international competitive situation with Asian and U.S. markets as pioneering. The national suppliers, taken individually, would suffer to varying degrees from the new competition in their further development. Synergy effects through GAIA-X can mitigate these competitive features.

[6] Within the clarification around the diesel exhaust values it was determined that the German OEMs agreed on a smaller size of the ADBlue tanks, which are necessary for the cleaning of exhaust gases. This became important because a larger ADBlue tank directly influence the size of the regular fuel tank. A smaller fuel tank reduces the range of the vehicles. The Daimler AG obtained immunity from prosecution within the leniency program, and VW AG and BMW AG had to pay 502 million and 373 million EUR fines, respectively for cartel-like agreements (Efler, 2021; Source: www.merkur.de/wirtschaft/adblue-eu-strafe-volkswagenvw-bmw-daimler-abgas-absprache-diesel-skandal-kartell-tank-bruessel-zr-90849661.amp.html.)

7. CONCLUSION

The automotive market is transforming itself almost completely through the changeover to electromobility and is confronted with different problem situations in the process. In order to achieve high efficiency in the transformation here, knowledge must be collected, analyzed and minimized, especially in the risk area. These risk factors extend across the most diverse areas of the value chain and must be considered in their interactions. This requires strategic management in all relevant areas. To make this possible, the holistic approach of Ansoff et al. was selected as the theoretical basis for modeling, since in this approach, in addition to the direct tangents, indirect reference moments in the form of customer expectations and likewise political influences are also included.

It was recognized that the technical component has a lesser influence than the compliance requirements and supplier setups for the drive form based on battery technology.

To facilitate the transition of the entire value chain for OEMs across Europe while keeping all relevant areas in view, the GAIA-X project was identified as an effective means. This project establishes new competitive opportunities in the face of increasing international market pressure.

For the automotive OEMs with high importance to the European economies, the possibilities of participating in GAIA-X are to be evaluated as very far-reaching. Which areas with which parameters are considered to have a positive impact on the automotive sector on the continent have been summarized within a parameter table and provide an overview of the potential activities that allow suppliers to reposition themselves.

An important factor in the differentiation of European OEMs lies in standardizations that must also be recognized internationally if international suppliers are to continue to serve the European market. The EU is an important political factor here, as all national OEMs are involved in it. By exchanging information via GAIA-X, the industry can more quickly adopt standardizations and implement them in its products.

When it comes to establishing new supplier relationships, the opportunities can also be considered high if the possibilities offered by GAIA-X are used. These are also based on the standardization approaches, but also extend to the OEMs' other unique selling points, which enable national and intranational competition on a wide scale. Body engineering, IT and AI in automobiles, services and other technical capabilities will continue to maintain and increase the individuality of manufacturers. This is equally true for competitive opportunities with the expansive markets of China and the U.S., as well as Japan and South Korea.

The battery component can gain an important push toward strong European manufacturing if battery components are standardized and generally used uniformly by all manufacturers. The extent to which Europe can build up its production and break away from international dependencies will also depend on the possibilities for sourcing raw materials. One basic idea here is to take the initiative in participating in raw material production in the relevant countries. The incentive must be created here by offering its offers of support in the infrastructural area (traffic, education, IT, etc.), which also serve sustainability. In this way, one can enter into direct competition with American and, above all, Chinese efforts to influence the producing countries. The market power of Europe as an importer due to a large demand represents important incentive moments here.

However, the recognized possibilities are based on the willingness of all participants to the structures of the GAIA-X project, which can be described as high so far. However, further expansion at this level is urgently required.

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Development of the Risk Management System in Croatian Companies

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International business

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Abstract: *Modern business conditions change significantly and the company and the management face the challenge of how to predict the future and make timely decisions to prepare the company for future business. Therefore, increasing attention is paid to the issue of risk management. This paper presents a theoretical and practical contribution to understanding the importance of risk management systems in Croatian companies operating in international markets. Modern business conditions are discussed in the introduction, and then the term "risk management system" is conceptually discussed. The research part of the paper presents the results of empirical research on the perception of respondents about the degree of development of risk management systems in their companies using the "Weight of Evidence" method. The "Weight of Evidence" method is a method used to calculate the value of the strength of the influence of each represented variable from the observed samples on the defined target variable. A low level of system development has been established. Risk management systems, unfortunately, are only used by large companies. The application of a comprehensive risk management system can significantly increase the efficiency and effectiveness of the company's business, and accelerate the economic development of the Republic of Croatia.*

1. INTRODUCTION

Modern business conditions are characterized by the dynamics and complexity of the environment (turbulence) and increasing differentiation within the company. Such conditions limit the transparency of future events and increase uncertainty in each business segment, and make it difficult to manage the company or decision-making at all levels. Uncertainty increases in each business segment. Consequently, the company's management is increasingly focused on business risk management (Andrijanić, Gregurek, & Merkaš, 2016), i.e. the challenge facing the company, or company management is how to predict the future and make timely decisions to prepare the company for future business and thus ensure the vitality of the enterprise. Accordingly, the increase in the value of the company and sustainable business as a target function of its existence is increasingly endangered, i.e. exposed to various forms of business risks. Therefore, increasing attention is paid to the problem of risk management, which occurs, in addition to the classic functions of management (planning, organizing, leading and motivating, human resources management, control), as a new (sub) function.

Describing turbulent changes in the environment and the reflection, i.e. the operation of the company Kotler and Caslione (2009) propose a new system - Chaotics Management System as a systematic approach to detecting, analyzing, and responding to the turbulence and chaos consisting of the following three elements:

- detection of the sources of the turbulence, uncertainty through the development of early warning systems
- response, reaction to chaos through development, construction of Key Scenarios
- strategy selection based on prioritization and risk appetite.

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The authors view risk management only as part of a broader system, the chaos management system. It can be said that this is actually a change management system.

All of the above, among a number of other reasons, affect the success of Croatian companies in international markets. Croatian companies are insufficiently prepared for international market competition, which consequently leads to the trade deficit of the Republic of Croatia. Statistical data indicate that the difference between merchandise exports and imports is continuously increasing, i.e. that imports are growing more nominally than exports.

Table 1. Trends in exports and imports of the Republic of Croatia in million EUR

	2018.	**2019.**	**2020.**
Export	14.543	15.227	14.900
Import	23.748	24.981	22.918
Difference/Deficit	- 9.205	- 9.754	- 8.018

Source: Author's assesstment according to (Statističke informacije 2021, 2021, str. 81)

The research problematizes the low level of competitiveness of Croatian companies in international markets. The question is whether one of the reasons why Croatian companies are not significantly present in international markets with their products and services is inefficient risk management, especially strategic risks and failure to use "silent" early warning signals as a way of early detection and prediction of future events for business and the international market. A change in the approach to risk management in international business can significantly contribute to the greater efficiency of Croatian companies, and thus their better preparedness for the international competition. Assumptions for the full application of the Enterprise Risk Management system in Croatian companies include the need to expand the cognitive horizon of corporate managers at the highest levels. Unfortunately, the necessary improvements in the management competencies of Croatian managers are being implemented too slowly, which has resulted in the "problem of lack of management" or lack of use of modern management skills in Croatian companies.

The subject of the research is the attitudes of the respondents about the level of development of the risk management system in their companies operating in international markets. The elements of the research are the distribution of Croatian companies operating in international markets according to legal form, company headquarters, ownership structure, company size with the respect to annual income, position of respondents within the company and core business according to the National Classification of Activities.

In order to meet the objectives of the research, based on the available professional and scientific literature, the levels of the risk management system as a function of management in enterprises in developed economies were observed by cabinet methods and defined theoretical principles of risk management.

The primary research was conducted on a sample of Croatian companies operating in the international market. The data were collected by conducting an online survey for the development of the author's doctoral dissertation entitled "Early warning systems for strategic risks in international business." The online survey included 44 questions. 6 questions were related to independent research variables on general data on respondents, and 38 questions were related to dependent research variables, of which 12 questions were about the functionality and development of the risk management system. The originality of this paper is in the fact that, unlike the doctoral

dissertation, the collected data were processed using the "Weight of evidence" method. Using the "Weight of evidence" method, the strengths of the influence of each represented value in all distributions according to the elements of the research object on the observed target variable related to the desired state of the implementation level of the risk management system were calculated.

The aim of the research is to describe the strengths of the influence of each represented value of independent variables from all observed distributions of companies operating in international markets. The description contains numerical values of the strength of the influence of each represented group of companies, in all observed distributions according to the elements of the research subject, on the desired modality of the development of the risk management system. All calculated values of impact strengths were interpreted. Based on these facts, it is possible to draw relevant conclusions about the levels of development of risk management systems in Croatian companies, observed by company size, legal form, company ownership, business sector, company headquarters and position of respondents.

The purpose of the research is to use argumentative information to point out the necessary changes in Croatian companies operating in international markets. Based on this information, the elements of necessary changes related to the application of modern management methods and techniques could be defined, which should result in higher efficiency and effectiveness of Croatian companies, which would lead to a reduction of the Croatian foreign trade deficit.

The size and profile of the sample of surveyed companies can be mentioned as research limitations. The sample was represented by successful Croatian companies operating in international markets, of which there are not many in Croatia, so the sample is relatively small. Precisely because successful companies were surveyed, they are more likely to have implemented a risk management system compared to other Croatian companies, i.e. it can be assumed that the survey results would have been even worse if the sample had covered the entire economy. An additional limitation of the research may be the number of responses received. The survey questionnaire was sent by e-mail to managers who, due to their busy schedules, rarely decide to participate in research. Primary data were collected during only two months which also affected the number of responses received.

Studying the available secondary sources, in the databases of scientific papers Web of Science and Scopus no paper was found in which data on the state of development of risk management systems in Croatian companies would be available, which indicates the originality and value of the research. Furthermore, the results of the research additionally reveal, given the independent research variables, in which Croatian companies the risk management system is the most, and in which it is the least developed.

2. THEORETICAL SETTINGS OF THE RISK MANAGEMENT SYSTEM

Circumstances in which managers make a decision and assess the consequences of that decision can be: certainty, risk and uncertainty. Certainty can be defined as a condition in which only one outcome, which is known in advance, can occur as a result of a decision. Total certainty exists only theoretically. Risk is a situation when the results are predicted they are not sure, but the values for different results are known. In these circumstances, the decision maker should determine the probability for each possibility. Risk in decision-making should not be viewed as a danger but should be seen as a degree of certainty with which the outcome and consequences of

a decision can be predicted. The probability of each possible outcome can be assessed on the basis of previous experience or from market studies, or different risk assessment techniques. Uncertainty is the case when a decision has several possible results but, unlike risk, it is not known nor the probability of achieving each result can be estimated.

2.1. Defining the Term Risk

What is the risk? For an individual, crossing the street can be a risk. For a company, it could be a marketing investment in a new product, an aggressive competitive takeover bid by a large competitor, or a fire in the main plant.

E. Vaughan and T. Vaughan (1998, str. 53) define risk "as a condition in which there is a possibility of a negative deviation from the desired outcome expected". "Risk can also be defined as a calculated prognosis, i.e. the probability of possible damage, loss or danger" (Andrijanić, Gregurek, & Merkaš, 2016, str. 17). Another definition says that risk is "the chance that something will happen that will affect our goals. The consequences and probability of events are measurable" (AS/NZS 4360:2014, 2014). ISO 31000: 2018 (2021) defines "risk as the effect of uncertainty on objectives. The effect is a deviation from what is expected, and can be positive, negative or both, and can result in opportunities or threats".

Based on the above, the definition that could refer to the company and its functions and the purpose of existence would be: "Risk is the probability that something will not happen as intended - the result may be better or worse than expected. In corporate terms, this means that the risk is failure to meet business goals and should include opportunities and threats to the environment that can potentially contribute to the growth and development of the company or prevent development, and thus jeopardize the survival of the company" (Kereta, 2021).

There may be uncertainty about the price of gold at the end of the year, but this is not a risky situation for one who has no consequences after that change. Also, if the prices of shares that someone owns change, it is not a risky situation if they do not sell them, unlike the situation when they decide to sell them - then there can be positive or negative consequences.

The two main forms of risk that can be considered are:

1. "The result is worse than expected, i.e. the loss would be smaller if we kept the status quo
2. The result is not as good as might otherwise be expected under the circumstances" (MacCrimmon & Wehrung, 1986, str. 10). The first case is easily recognizable as real, real loss; while in others, the opportunity loss may not be so easily observed. Opportunity loss turns a seemingly risk-free situation into a risky one, but this is only noticed when an unforeseen event occurs.

The concept of risk consists of three elements:

- perception that something could happen;
- the likelihood that something will happen;
- the consequences of what might happen.

The degree of risk is a combination of the probability of risk occurrence and the consequences of risk. Risk management or treatment actions, which therefore change the degree of risk, should refer to a change in the probability of an event or the consequences of that event, or both (Kereta, 2021).

Identifying sources of risk and areas of their influence and impact is an important prerequisite and assistance as it provides a framework for identifying and analyzing risk. Due to the potentially large number of sources and effects, the creation of a general list of risk sources should be focused on activities to identify as many risks as possible. Each source of risk consists of a number of components, each of which can increase risk. Some of these components may be under the control of the company, i.e. they are non-systemic risks that arise from internal sources and that can be influenced by the company's management. On the other hand, there are components from external sources, which are systemic risks that are beyond the control of management and the company as a whole, and which need to be adjusted. Nevertheless, both types and their action and effects should be taken into account when determining risk (Kereta, 2021).

There is a link between risk management and company value. The goal of business risk management is to maximize value for owners, that is, to maximize the value of the company. Risk management, as an integral part of business processes, cannot be separated from managing the entire business. A risk perspective is needed, but not all efforts should be made to minimize the risk because the risk is positive and desirable for business owners if it is managed and used to generate profits and thus increase the value of the company.

2.2. Risk Management Process

In the process of managing the entire business, including risk management, managers have at their disposal various techniques and methods that facilitate their decision-making in modern business conditions characterized by turbulence, frequent variability and instability of the environment. Considering the way of expressing the probabilities and consequences of technical events, we divide them into qualitative and quantitative. Qualitative techniques use words or descriptive scales as a means of expression, while in quantitative ones the consequences and probability are mathematically measurable and are expressed by numerical values (Kereta, 2021, str. 49).

The Australian standard lists the following "main elements - stages of the risk management process: contextualization, risk identification, risk analysis, risk assessment, risk treatment, supervision and control, communication and consultation" (AS/NZS 4360:2014, 2014). This division covers the necessary content of the risk management process and is a logical sequence of risk management, where the analysis and assessment (evaluation) of risk is actually one phase because they complement and represent the whole, and because their importance can be expressed as separate parts. The formal step-by-step process includes contextualization, identification, analysis, assessment, handling, and monitoring of risks, with effective communication and consultation with participants. It can be applied to decision-making in all companies and at all levels of the organization (that is, at every level of organization, program, team and individual) and for any function or activity.

Risk management is an integral part of the management process; it is multiple processes whose certain aspects are often best implemented by a multidisciplinary team. It consists of well-defined steps that are taken in the right order to provide better support for decision-making by contributing to greater insight into risks and their consequences. Risk management is as much about identifying opportunities as it is about avoiding threats, it is the totality of culture, processes and structures, which together form the optimum for managing potential opportunities and negative effects (Kereta, 2020).

The risk management process is a structured framework for integrating risk management into broader corporate governance processes. The approach will vary from company to company, from program to program and depending on the type of activity. In other words, the application of the risk management process depends on the context. The risk management process can be applied at any time during the existence of the program, project, or activity. It should be used, where possible, at the beginning of each new project or change in the operating environment (e.g. a new business policy proposal, or a change in the production program). The risk management process can be applied at all levels of the organization - strategic, tactical and operational, but should start from the strategic level, i.e. only by completing the strategic aspect it is possible to ensure that tactical and operational phases are accurately located within the strategic context (Kereta, 2021).

3. ANALYSIS AND INTERPRETATION OF RESEARCH RESULTS

There are three subchapters in this chapter. The first refers to the description of the researched data. The second subchapter describes the method "Weight of evidence" used in the research to determine the strength of the impact of each represented value from all observed distributions according to the elements of the research subject on the development of risk management systems in Croatian companies operating in international markets. In the third subchapter, the tables show the values of the strength of the impact for each observed distribution. For the values that indicate the highest and lowest development of the risk management system, the authors of the research offer explanations why the levels of development of the risk management system are exactly like that.

3.1. Description of Researched Data

For the preparation of this research chapter, the primary data collected by the author for the purposes of preparing the doctoral thesis were used. The link to the online survey was sent to 380 companies via e-mail. The questionnaire was completed by 120 respondents from Croatian companies operating in international markets, which makes the response rate of 31.6% considered relevant. The primary data were collected during May and June 2019, i.e. in a certain period, which limits the results of the research at that point in time. Unlike the doctoral dissertation in which, using mathematical-statistical methods, basic indicators of descriptive statistics were calculated, and correlation and regression analysis analyzed the relationship between individual variables, in this paper a sample of data were processed using the "Weight of evidence" method.

3.2. "Weight of Evidence" Method

The "Weight of evidence" method is a method used to calculate the value of the strength of the influence of each represented variable from the observed samples on the defined target variable. It is most commonly used to construct prognostic models when the target variable may have two or more values. In this study, the target variable has two values. These are desirable and undesirable modalities of the development of risk management systems in Croatian companies operating in international markets. The preferred modality refers to the respondents' attitudes to the question: "Does your company/organization have a developed risk management system and how developed is it in relation to your understanding of what it should include?" who selected the offered answers "I agree" and "I completely agree". The undesirable modality refers to the three remaining offered answers "I completely disagree", "I do not agree" and "I agree and I do not agree (I cannot decide)".

The value of the strength of the influence of each variable on the target is calculated according to the formula WoE = ln (Dnc / Dc). This means that the value of the level of influence of each represented value from each distribution represents the natural logarithm of the percentage ratio between the desired modality, the Dnc value and the undesirable modality, the Dc value (Sugumaran, Sangaiah, & Thangavelu, 2017, str. 141-179). It should be noted that, since these are the values of the natural logarithm of the ratio, the size of the investigated sample is not so important. Precisely because of this, the results of this research can be considered relevant at the level of the entire Croatian economy operating in international markets. In cases when the value of the binomial variable is equal to zero, when in the observed distribution according to the elements of the research object no respondent answered any of the offered answers that represent desirable or undesirable modality of risk management system development, the author's guideline is to correct the natural logarithm of the ratio, so it is 0.1 if the value of the undesirable modality is 0.00%, and if the value of the preferred modality is 0.00%, the value of the natural logarithm of the ratio is corrected to the value -0.1 (Sugumaran, Sangaiah, & Thangavelu, 2017).

3.3. Evidence Strength Values within the Observed Distributions

Table 2 shows the values of the strength of the impact of all represented values from the distribution of respondents according to the legal form on the view that the risk management system is developed. The risk management system is most developed in joint stock companies and least in limited liability companies. Joint stock companies are larger companies that, as a rule, have an extensive organizational structure and precisely established business functions, and most often a special organizational unit for risk management.

Table 2. Development of risk management system according to the legal form of the company

Weight of evidence	Legal form
1,9661	Joint Stock Company
0,2231	Simple Limited Liability Company
0,1000	Limited partnership
0,0000	Other
-0,1000	Crafts
-0,8014	Limited Liability Company

Source: Author's processing

The risk management system is the least developed in limited liability companies and trades, which can be explained by the fact that the implementation of a comprehensive risk management system is quite demanding organizationally, personnel and financially. Although they do not have a formally established risk management system, it can be assumed that the owners and managers of these companies also think about risks, because each decision contains a certain degree of risk. The high level of recognition of the importance of risk management systems in simple limited liability companies is surprising. In fact, these companies are most often one-man businesses, and owners who are also managers of simple limited liability companies, if they have developed intellectual capacity, recognize the importance of risk management systems and apply it at least in part. It can be concluded that larger companies/organizations, such as joint stock companies, have formal risk management systems in place.

Observing the values of the variable "Weight of evidence" on the development of risk management system according to the counties of the surveyed companies, it is noticed that the system is

most developed in companies whose headquarters are in Sisak-Moslavina, Dubrovnik-Neretva, Istria, Primorje-Gorski Kotar County. These are mainly economically more developed counties (except Sisak-Moslavina), and companies based in these counties also have significantly more developed risk management systems compared to companies based in other counties. This fact can be explained by the reverse approach. Economically more developed are those counties in which the headquarters of companies have developed risk management systems. It can be concluded that there is a correlation between the development of a particular area (country, region) and systematic risk management, or the application of modern methods of enterprise management. In addition, a high percentage of the development of risk management systems is in companies based in the City of Zagreb and Zagreb County, which can be related to the fact that The Republic of Croatia is highly centralized, so the majority of economic activities take place in Zagreb and its surroundings.

Table 3. Development of risk management system according to the company's headquarters

Weight of evidence	County seat
2,3026	Sisak-Moslavina
1,6094	Dubrovnik-Neretva
0,9163	Istria
0,9163	Primorje-Gorski Kotar
0,5108	Zagrebačka,
0,1335	City of Zagreb
-0,1000	Bjelovarsko-bilogorska
-0,1000	Karlovačka
-0,1000	Koprivnica-Križevci
-0,1000	Krapina-Zagorje
-0,1000	Lika-Senj
-0,1000	Međimurska,
-0,1000	Osijek-Baranja
-0,1000	Požega-Slavonia
-0,1000	Split-Dalmatia
-0,1000	**Šibenik-Knin**
-0,1000	Varaždinska,
-0,1000	Zadarska,

Source: Author's processing

Observing the values of the variable "Weight of evidence" on the development of risk management system according to the counties of the surveyed companies, it is noticed that the system is most developed in companies whose headquarters are in Sisak-Moslavina, Dubrovnik-Neretva, Istria, Primorje-Gorski Kotar County. These are mainly economically more developed counties (except Sisak-Moslavina), and companies based in these counties also have significantly more developed risk management systems compared to companies based in other counties. This fact can be explained by the reverse approach. Economically more developed are those counties in which the headquarters of companies have developed risk management systems. It can be concluded that there is a correlation between the development of a particular area (country, region) and systematic risk management, or the application of modern methods of enterprise management. In addition, a high percentage of the development of risk management systems is in companies based in the City of Zagreb and Zagreb County, which can be related to the fact that The Republic of Croatia is highly centralized, so the majority of economic activities take place in Zagreb and its surroundings.

Table 4. Development of risk management system according to the size of the company

Weight of evidence	Size of enterprise
2,0949	Large Enterprise
-0,1000	Small (less than 50 employees and total annual turnover less than € 10 million or balance sheet less than € 10 million)
-0,3365	Medium-sized (less than 250 employees and total annual turnover less than € 50 million or balance sheet less than € 43 million)
-1,0761	Micro (less than 10 employees and total annual turnover less than € 2 million or balance sheet less than € 2 million)

Source: Author's processing

The development of the risk management system in the distribution of respondents according to the size of enterprises according to annual revenues is most pronounced in enterprises that are classified as large by size, and least in enterprises that are classified as micro enterprises. It can be concluded that only large companies can have the appropriate organizational, personnel and financial resources necessary to implement a comprehensive risk management system, and risk management systems are fully developed and applied only in large companies.

Table 5. Development of risk management system according to the form of ownership of the company

Weight of evidence	Form of ownership
1,6094	A majority or wholly state-owned enterprise
0,9163	Private enterprise in the majority or full foreign ownership
-0,5754	Private enterprise in the majority or full domestic ownership

Source: Author's processing

Analyzing the answers to the question about the development of the risk management system in relation to the distribution of respondents according to ownership structure, the risk management system is most developed in companies that are classified as "majority or fully state-owned", and least in companies that are classified as: "Private enterprise in the majority or full domestic ownership". Somewhat surprising are the answers that the risk management system is highly developed in state-owned enterprises; it can be assumed that it is more about meeting formal legal requirements for establishing a system of internal controls and risk management, and less about an essential understanding of risk management issues.

Table 6. Development of risk management system according to the position of the respondents within the organizational structure

Weight of evidence	Position within the organizational structure
1,2040	Lower management
0,7221	Specialist/employee (not in a managerial position)
0,1214	Senior management
-0,1000	Middle management
-0,6152	Company owner

Source: Author's processing

It can be concluded that the risk management system is much more developed in companies that are majority or wholly foreign-owned, which is a consequence of the transfer of modern methods and techniques of corporate governance from developed economies to transition economies

such as Croatia. Domestically owned companies have yet to adopt best practices and business management models, which certainly include risk management.

Observing the development of the risk management system in the distribution of respondents according to the position of respondents within the organizational structure within the company, the risk management system is most developed in companies where respondents within the organizational structure had the position: "Lower management" and "Specialist/employee", and at least in companies in which the respondents within the organizational structure had the position: "Business owner". From these results, it can be concluded that business owners, who should be most interested in risk management, least recognize the importance of systematic risk management, or do not recognize the contribution of risk management systems to more successful business operations. On the other hand, lower management and specialists, i.e. employees who are not in managerial positions, recognize or give the greatest importance to the risk management system, which indicates the importance of human resources. Employees with their competencies represent a source of competitive advantage in all business segments, and especially in highly sophisticated management "tool" such as a risk management system.

Table 7. Development of risk management system according to the business activity of the company

Weight of evidence	Activity
1,5041	Financial and insurance activities
0,5108	Electricity, gas, steam and air conditioning supply
0,1054	Construction
0,1054	Manufacturing
0,0000	Professional, scientific and technical activities
-0,0488	Wholesale and retail trade
-0,1000	Administrative and support service activities
-0,1000	Accommodation and food service activities
-0,1000	Health and social work activities
-0,1000	Information and communication
-0,1000	Education
-0,1000	Water supply; wastewater disposal, waste management
-0,1000	Agriculture, forestry and fishing
-0,1000	Repair of motor vehicles and motorcycles
-0,1000	Real estate activities
-0,1000	Transport and storage
-0,1000	Activities of households as employers; activities of households that produce various goods and provide various services for their own use
-0,1000	Transport and storage
-0,1823	Other service activities

Source: Author's processing

The risk management system is most developed in companies whose classification is according to the National Classification of Activities (NKD): "Financial and insurance activities", and least in companies whose classification is according to the NKD: "Other service activities". The high development of the risk management system in financial and insurance activities is largely a consequence of regulatory requirements and supervision. These are industries that are highly regulated, especially in the field of risk management, both EU directives

and national legislation (Basel III, Solvency II). There are several reasons why this is necessary: they manage the money of savers and insured persons, and problems and delays in the operation of the financial system consequently contribute to the stagnation of the economy as a whole.

4. CONCLUSION

Starting from the fact that macroeconomic imbalances are continuously present in Croatia and that the Croatian trade deficit is continuously increasing, it is obvious that there is a need to increase revenues from merchandise exports. Croatian companies should be more competitive in international markets. This paper discusses the low level of competitiveness of Croatian companies in international markets. The subject of the research is the attitudes of the respondents about the level of development of the risk management system in their companies operating in international markets.

The risk management system is extremely important for companies, especially in today's time of high business turbulence, and thus for Croatian companies operating in much more competitive international markets. Scientifically based risk management can significantly increase the efficiency and effectiveness of Croatian companies in general and their competitiveness in the international market, and thus increase Croatian merchandise exports. Changes in the approach to business risks and the implementation and regular implementation of activities and certain formal steps of the risk management system can significantly contribute to the success of Croatian companies, and thus their better preparedness for a competitive international market.

Special attention should be paid to the strategic risk management system as a management tool that reviews the existing strategy and its compliance with expected changes in the environment and, consequently, the creation of recommendations for the necessary changes in the company's strategy.

The results of the conducted empirical research show that the subjective perception of the respondents about the level of development of the risk management system in Croatian companies is low. Comprehensive risk management systems, unfortunately, are applied only by large and wholly or majority foreign-owned enterprises. This fact indicates that there are ways in which Croatian companies operating in international markets could and should improve the competitiveness of their market offers, and one of them is the regular application of risk management systems.

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Consumers' Motivation to Participate in the Digital Economy and Changes Associated with the Pandemic

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Abstract: *Pandemic is an external shock that influenced behavior of consumers across the world. During the pandemic, there were apparent changes in purchasing patterns in the market given the uncertainty in the markets. The uncertainty in markets generally leads to caution in spending and encouragement of saving. Another major driver of the change of behavior was the introduction of various anti-pandemic rules and lockdowns. Restrictions led to deferred consumption which was apparent in the global economy in 2021 and the first quarter of 2022. This paper provides an insight into consumer motivation in the digital economy and the changes associated with such behavior in the pandemic and post-pandemic era. The nature and characteristics of digital business models were essential during the pandemic not just because of the reduction of transaction cost and thus higher efficiency but also because of the necessity of social distancing.*

1. INTRODUCTION

Digital business models are models that are primarily based on digital transformation and the development of modern technologies. Through modern technologies, companies with these models are able to add value to their customers and make a profit. A huge advantage of these models is their scalability, network effect and usually very low cost. Dozens of new business models or changes to existing models are created every year. This paper deals with the changes in the cultural market due to the digital transformation and the situation around the COVID-19 pandemic from the consumer's point of view. The research will pay special attention to changes in consumer preferences and changes in motivations in the digital economy, as well as changes in consumer behavior.

2. DIGITAL BUSINESS MODELS AND MOTIVATION TO PARTICIPATE

A business model is a tool that expresses the logic of companies and describes how the company interacts with customers and other stakeholders. The business model describes the structure of the business and how it supplies its products and services and thus generates profit and long-term sources of income. (Osterwalder, Pigneur & Tucci, 2005) Companies using digital business models are characterized by digitization of part or the entire agenda of the company. Digital businesses have two basic features in common. The first is the widespread use of modern digital technologies and the second is a dramatic reduction in transaction costs. (Hull et al., 2007)

All of these business models have two key features in common. They use modern technology, which dramatically reduces transaction costs. Due to these business models, many changes are taking place in new and traditional markets. The relationship between the organization and customers is changing. These changes also affect the characteristics of services and products and

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the way they are delivered to the market, which opens the door to the customer-supply and value chain for existing and new market players. Dozens of new business models or changes to existing models are created every year, which adds to the importance of this phenomenon from the point of view of academic research. (Frenken & Schor, 2017; Kraus et al., 2019)

Digital business models build on the opportunities brought by technological progress, digital transformation and advances in communications technologies. These changes at an accelerating pace redefine the way people on the planet communicate, collaborate, and trade with each other. At the same time, societal changes are key to the development of digital business models. The most important changes are the adoption of modern technologies by the general population, the growth of digital literacy, the growth of wealth, change in the behavior of market agents and their preferences, and ongoing urbanization and globalization. (Narasimhan et al., 2017) Technological and societal changes mentioned above create additional space for the use of digital business models and thus contribute to their development and involvement in markets.

The development and expansion of the Internet and other communication technologies have had a significant impact around the world. Easier and less costly communication between market participants further supports the development of digital technology. Technological progress and technological sophistication have a major impact on the growth of wealth. (Akerman & Kuznets, 1955; Solow, 1956; Horvath, 2011) At the same time, societal changes are key to the development of digital business models. The most important changes are the adoption of modern technologies by the general population, the growth of digital literacy, the growth of wealth, change in the behavior of market agents and their preferences, and ongoing urbanization and globalization. (Narasimhan et al., 2017) Technological and societal changes mentioned above create additional space for the use of digital business models and thus contribute to their development and involvement in markets.

Digital business models can also be seen as a way to connect the digital world and traditional markets through new ways of doing business in the digital age. Digital technologies and digital platforms can increase the efficiency of economic goods delivery in many industries, providing traditional services and products faster, cheaper, better and more efficiently. Thus, motivating market agents including consumers to participate. An example is the provision of standard passenger transport services via a digital platform, such as Uber. Furthermore, completely new industries, companies and business models are emerging that offer new services. Examples are new streaming services such as Spotify or Netflix. (Sussan & Acs, 2017)

3. EFFECTS OF PANDEMIC ON CONSUMER BEHAVIOR

An important topic in the field of study of changes in consumer behavior in the pandemic and post-pandemic era is the so-called deferred consumption. That is the part of the income and wealth that consumers decide to defer regularly to save to spend in the future on for example holiday-type expenses. This phenomenon took on a new dimension during the pandemic. Market agents including consumers had limited opportunities to consume due to the presence of anti-pandemic measures, rules and restrictions such as the closure of restaurants, cinemas, theaters, sports venues and other sectors of the economy. In a sense, consumers put aside part of their consumption because of the restrictions in the economy. (Veselovská et al., 2021)

In case of postponement of consumption, or the impossibility of consuming certain types of economic goods, especially in the middle-income class, there was room for an increase in their

propensity to save. The situation across European countries, of course, varied according to the intensity of the disease and anti-pandemic measures. An important factor is the degree of caution of households, which preferred to save more than usual in times of uncertainty caused by the pandemic and lockdowns for them to be prepared for any unforeseen situations in the future. (Veselovská et al., 2021) (Lemes Bausch et al., 2021)

Research in household consumption habits in times of macroeconomic uncertainty speaks of a lower willingness to spend. According to a survey of European households, the higher macroeconomic uncertainty caused by the pandemic leads households to reduce their spending on services, luxury goods, travel abroad and non-durable goods. Moreover, macroeconomic uncertainties in times of the tense geopolitical situation, expensive commodities, insufficient world supply capacity, high inflation and other waves of the pandemic in Asia are unlikely to end in the coming months. Thus, the pressure to reduce the consumption of some economic goods can be expected to continue. (Coibion et al., 2021)

The effect of lower willingness to spend in uncertain times will go directly against the effect of catching up on so-called deferred consumption described above. After the abolition of anti-pandemic rules, we could see strong demand across the world economy. Postponed or deferred consumption led to a sharp increase in consumption in a number of countries. Consumers are using their savings to finance their consumption as most of them wanted to catch up on what was lost during the pandemic. The amount of deferred consumption can be relatively high, which is also in line with data on strong world demand in 2021 and the course of 2022 so far. In the first quarter of the year 2022, it seems that the effect of deferred consumption outweighed the effect of the lower willingness of households to spend in uncertain times. (Coibion et al., 2021)

Current research shows that while there were significant cut backs on spending on discretionary expenditures there was also an increase in other areas such as the purchase of groceries, household supplies, snacks, electronic goods, office supplies for home office reasons and other supplies used for at home entertainment. (Coibion et al., 2021) (Güngördü Belbağ, 2021)

4. PANDEMIC AND DIGITAL ECONOMY

The entire area of the digital economy is very interesting in light of changes in consumer behavior during and after the pandemic. The undeniable benefits of the digital economy, including the reduction of necessary social contact, have become apparent at the time of the anti-pandemic measures in place. The sudden necessity of social distancing significantly accelerated the use of digital technologies. According to LaBerge (2020) the environment of pandemic accelerated the use of digital services by three years. It is also expected that the pace of those changes will be at least maintained as there are other significant motivators to stay in the digital economy such as efficiency, lower transaction costs, broad supply of different economic goods, stronger digital infrastructure, transformation of individual businesses and whole sectors of economy. (Güngördü Belbağ, 2021) (Jiang, 2020)

Figure 1 captions the increase in average share in percentages of customer interactions that are digital. It is apparent that the global average of such interactions reached 20 % in June 2020 and stayed at that level until May 2018. There has been a rapid increase even in pre-pandemic year 2019, where the average share of customer interactions that were digital reached 36 %. In just

seven months, in July 2020, the share of digital interactions globally reached 58 % as the virus was spreading and the number of anti-pandemic rules were set and enforced across the world, which is according to LaBerge (2020) estimation a leap forward in the adoption of digitalization by three years.

Highest average percentage of digital customer interactions during the pandemic month of July 2020 was present in the region of North America, where the share rose to 65 % (seven percentage points above the global average). Europeans on the other hand reached 55 % of total interactions being digital, which is three percentage points below the average.

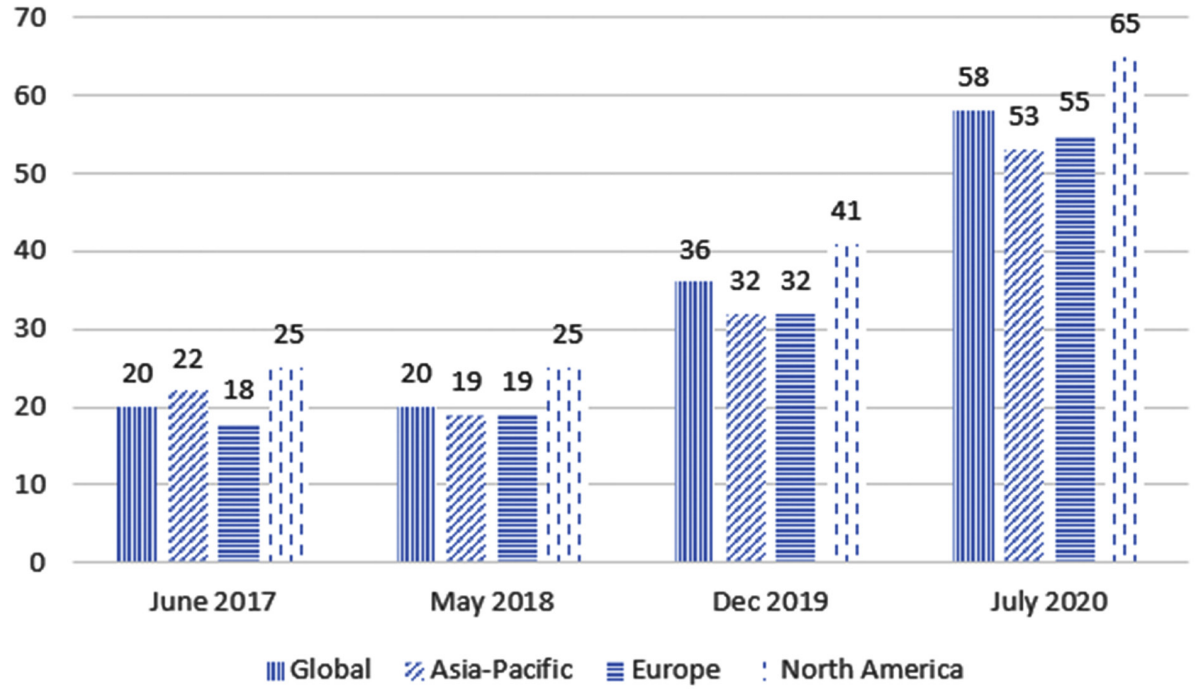

Figure 1. Average share of customer interactions that are digital, %

Source: LaBerge, 2020

The pandemic and restrictions on human behavior fundamentally changed consumer behavior, the economy, and the style of work, which enabled the creation of new habits, purchasing patterns and thus the change in preferences on the market. Joshi and Chaudhary (2021) show that 38,6 % of consumers in India fundamentally changed their behavior on the market and that 55,6 % of consumers in India adopted online platforms after lockdown measures were introduced.

Significant changes in consumer behavior and preferences affected the supply side as well. Figure 2 shows the change in the average share of economic goods offered partially or fully digitized between June 2017 and July 2020. In this case, partial digitalization of economic goods could represent an option to buy, find, and consume online.

As we can see the global average share of economic goods offered at least partially online was 29 % in June 2017, 28 % in May 2018, 35 % in December 2019 and 55 % in the pandemic month of July 2020. The increase in seven months of the pandemic was apparent as the average global share jumped by 20 percentage points. Figure 2 shows that the adoption of digital trends is progressed and is still progressing on both the side of the supply and the demand. (Joshi & Chaudhary, 2021)

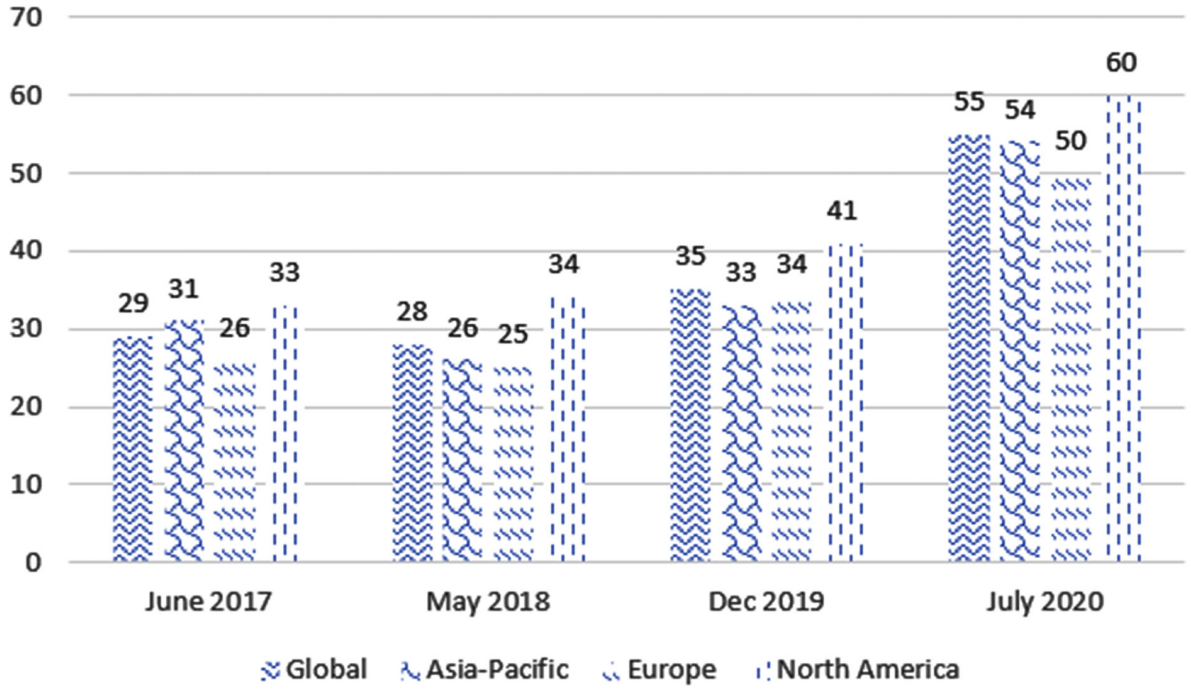

Figure 2. Average share of economic goods offered partially or fully digitized, %
Source: LaBerge, 2020

There is an obvious difference between sectors of the economy with and without a digital presence. For example, the automotive industry and the heavy industry overall reported very little change in the use of digital technologies. On the other hand, streaming services reported a significant growth in both consumers and traffic. Another area, where changes were significant were sectors of pharma and health care as the rules of social distancing were introduced in these areas as well and consumers still needed medical attention and medicine. (Kniazieva, 2021)

5. IMPLICATIONS FOR FUTURE RESEARCH

The digital transformation is happening faster than expected because of the pandemic and anti-pandemic measures. This calls for researchers, public officials, whole states and societies to address potential challenges so it is possible to reap the benefits that the digital economy can offer. From current academic research and practice, it is apparent that one of the main challenges will be online security and online privacy which is more important with the higher volume of interactions happening online. Security and protection of all citizens including consumers and workers online is another challenge for both local and global regulators. There are also new patterns in the work environment with working from home gaining popularity, which need to be addressed. The accelerated digitalization in the world economy also calls for further research in terms of marketing, which is one of the sectors of the economy that transformed the most during the pandemic and last but not least there is and will be new data available that will allow for further economic research in times of crisis, external shocks, changes in motivation related to different types of government support and so much more.

6. CONCLUSION

A pandemic is an external shock that has brought about many societal changes and forced a lot of reactions in society. One of the fundamental changes was the acceleration of the digitalization of the economy and the use of digital technologies among the general population, public

administration and the private sector. Many restrictions following anti-pandemic rules have led entire segments of society to social distancing. At the same time, entire sectors of the economy have been closed and consumers have not been able to spend their money in the way they used to before. The combination of these factors has supported the rise of the digital economy, where consumers have been looking for alternative ways to get basic supplies and also for alternative entertainment in times of lockdowns.

Consumer behavior during the pandemic was also affected by the so-called cautionary effect, which was also evident from macroeconomic data. According to the results of the survey, households are reducing their spending on average in times of crises for precautionary reasons. Economic agents during turbulent times tend to save more so they are prepared for potential problems ahead. A combination of a cautious approach to consumption and lockdown on entire sectors of the economy led to deferred consumption. This consumption was postponed until the economies were opened again. This can now be seen in the very strong world demand in 2021 and the first quarter of 2022.

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A Bibliometric Analysis of Digital Marketing Studies

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Keywords:
Digital marketing;
Bibliometric analysis;
Literature review;
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Abstract: *Studies on digital marketing have a wide place in both national and international literature. The rapid growth in e-commerce transactions brought about by the COVID-19 pandemic, as well as the digitalization applications brought about by the distance economy, reveal new digital-focused research areas for researchers. By conducting a bibliometric analysis of research articles with the keyword "digital marketing" in their abstracts in online "Web of Science" databases, the aim of this study is to provide conceptual and methodological contributions as well as literature support for new research areas that emerged during the pandemic period. The basic criteria such as the number of authors and articles, author profile, publication place information, year, article subject, keywords, and resource usage, as well as the connection networks between these criteria, are examined by bibliometric analysis, which has recently become widely used in the field of social sciences within the framework of a specific journal or a research topic. With this study, it is planned to identify research trends in the area of digital marketing, detect different research-related factors, and contribute to future research by pointing out research gaps. A discussion of the findings and advice regarding the network connections between studies on digital marketing concludes the study.*

1. INTRODUCTION

When the worldwide Internet first began, daily traffic was less than 100 Gigabytes (GB), but today it is 105,800 GB every second (Chaffey & Ellis-Chadwick, 2019). With the boom in internet growth, the concept of digital in business has started becoming very popular. This paper aims to provide conceptual and methodological contributions and demonstrate current and future trends in digital marketing. We have some research problems such as;

1. What are the publications and citation trend changes?
2. Which are the most productive author and journals?
3. What are the most cited studies?
4. How are the keywords used in studies clustered?
5. How does bibliometric interaction occur at the author level?

2. LITERATURE

The way that businesses and organizations interact with their audiences has changed because of digital marketing (Chaffey, & Ellis-Chadwick, 2019). Search engine optimization, email marketing, content marketing, social media marketing, mobile marketing, and other forms of online marketing are all included under the umbrella term of "digital marketing" (Gedik, 2020).

The phrase "digital marketing" was first used in Turkish marketing literature in 2003, according to a bibliometric examination of research utilizing the concept on a Turkish sample. The concept's formative years can be viewed as 2003 to 2014, and the number of studies employing the

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word has quickly expanded after 2014. (Zeren & Kaya, 2020). The results of the same analysis revealed that "social media marketing" was the most widely used word.

Another bibliometric analysis on the topic of digital marketing that was published in Turkey reveals that there were no studies in some of the years between 1982 and 2003, the number of studies rose after 2004, and 295 studies were released in 2019 (Erkan, 2020). In this study, research findings from all categories of the article, conference paper, book, and book chapter research are gathered from the Scopus database. The findings of a keyword analysis show that "digital marketing," "marketing," "social media," "e-commerce," "social media marketing," "social networks," "big data," "machine learning," and "mobile marketing" are among the terms that are frequently repeated.

The bibliometric analyses of digital marketing communication were explored by Kim, Kang, and Lee in 2019. They identified five key issues for digital marketing communication, including e-WOM, interactivity, DMC effectiveness, how marketing communication works, and attitudes.

3. METHOD

On October 8, 2021, data was collected from the Web of Science (WoS). In this study, keywords related to "digital marketing" were searched in the topic field. We planned this data in Figure 1 step by step.

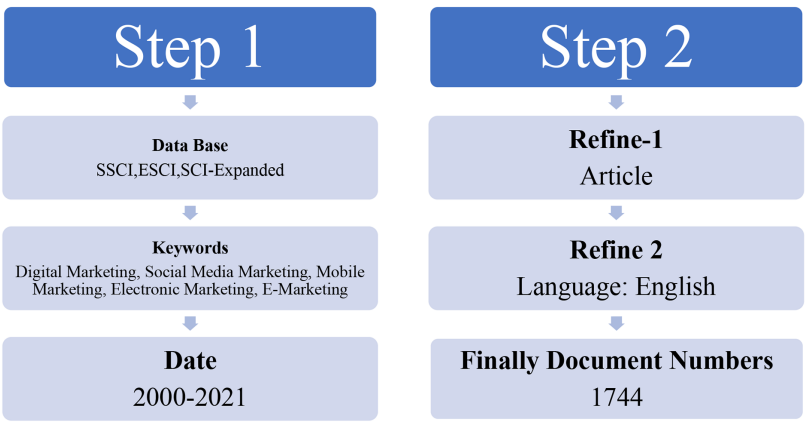

Figure 1. The Steps of Data Collect

Source: Own research

At the end of the steps, 1744 articles related to the concept of digital marketing were identified. WoS was used to export Full Record and Cited References. We used the VOSviewer program for bibliometric analysis.

4. RESULT AND DISCUSSION

The study first looked at the number of publications and citations by year. Figure 2 depicts the analysis results in terms of Publications and Citations. It can be seen that studies on digital marketing began to increase rapidly in 2008, and after that, especially after 2015, the annual number of WoS publications surpassed 100, and after 2019, the number of publications surpassed 200 annually. Citations increase in lockstep with the number of publications.

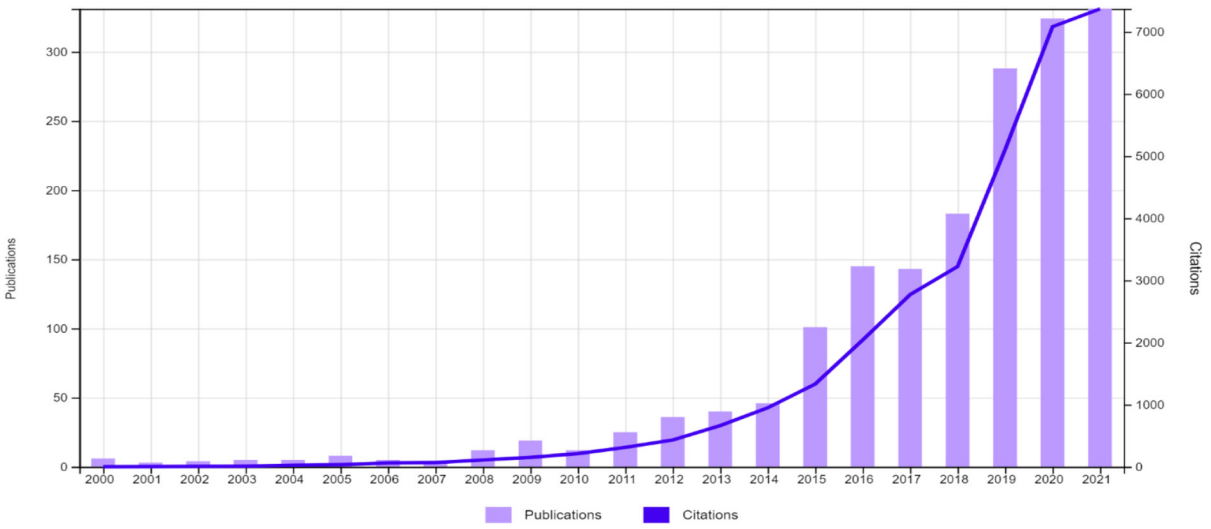

Figure 2. The Chart of Publications and Citations

Source: Own research

When the results of the digital marketing research were examined in terms of WoS Categories, they revealed that 740 studies were classified in the category of Business and 264 studies were classified in the category of Management. Detailed information on these classifications is given below.



Figure 3. The WoS Categories Dispersion of Digital Marketing

Source: Own research

The following Chart shows the most published authors in the field of digital marketing. Respectively, Kumar V. (9), Dwivedi YK (8), Pollak F (8), Saura JR (8) and all the rest of Figure 4).

The top four most published magazine Publication Titles are, respectively Journal of Research in Interactive Marketing, Journal of Business Research, Sustainability, and Journal of Interactive Marketıng.

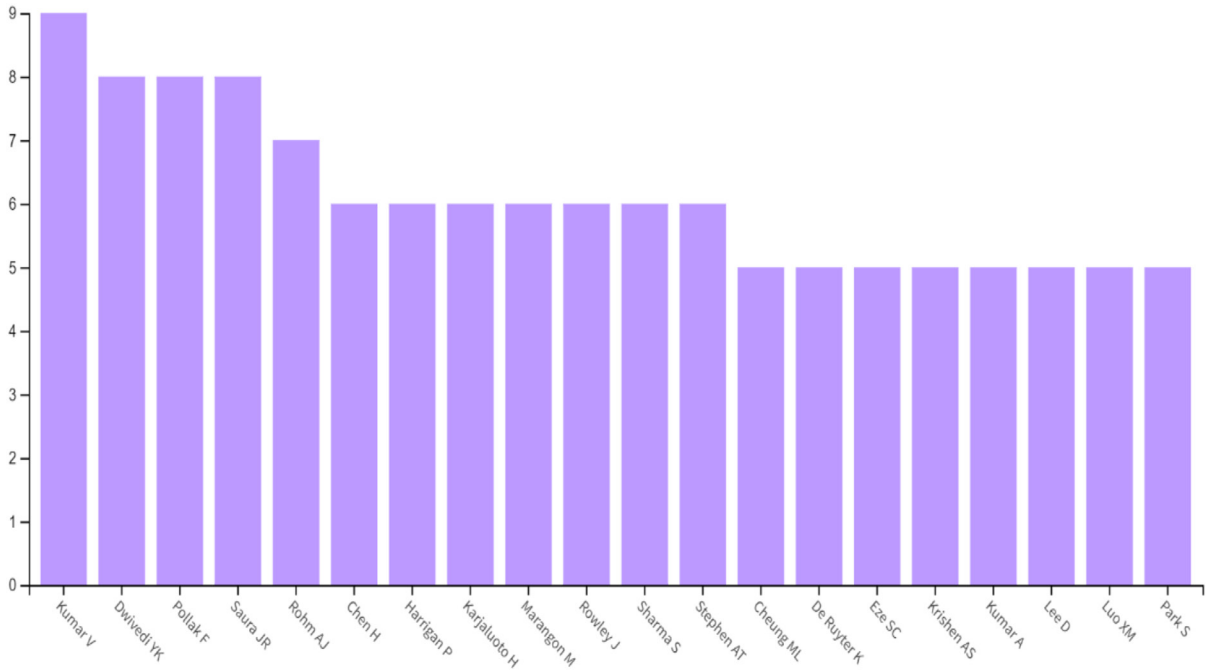

Figure 4. The Most Productive Author
Source: Own research



Figure 5. The Most Productive Publication
Source: Own research

The Highest Citations report is shown in the table below. The total number of citations to studies in the field of digital marketing from 2000 and later is 31,962, and the h-index is 79. The top 25 documents in our data. The most cited study in this field is "Networked Narratives: Understanding Word-of-Mouth Marketing in Online Communities" by Kozinets et al. (2010). This research was published in the Journal of Marketing, one of the most prestigious journals in the field. It is worth noting that the studies that rank first in terms of total citations were published between 2010 and 2015.

Table 1. The 25 Highest Citations Report in Digital Marketing Area.

Title	Authors	Source Title	Year	Vol	Issue	Total Citations	Average per Year
Networked Narratives: Understanding Word-of-Mouth Marketing in Online Communities	Kozinets, Robert V.; de Valck, Kristine; Wojnicki, Andrea C.; Wilner, Sarah J. S.	Journal of Marketing	2010	74	2	828	69
Popularity of Brand Posts on Brand Fan Pages: An Investigation of the Effects of Social Media Marketing	de Vries, Lisette; Gensler, Sonja; Leeflang, Peter S. H.	Journal of Interactive Marketing	2012	26	2	753	75,3
Do social media marketing activities enhance customer equity? An empirical study of luxury fashion brand	Kim, Angella J.; Ko, Eunju	Journal of Business Research	2012	65	10	649	64,9
Closing the Marketing Capabilities Gap	Day, George S.	Journal of Marketing	2011	75	4	392	35,64
Creative Strategies in Social Media Marketing: An Exploratory Study of Branded Social Content and Consumer Engagement	Ashley, Christy; Tuten, Tracy	Psychology & Marketing	2015	32	1	391	55,86
How Does Brand-related User-generated Content Differ across YouTube, Facebook, and Twitter?	Smith, Andrew N.; Fischer, Eileen; Chen Yongjian	Journal of Interactive Marketing	2012	26	2	390	39
Electronic word-of-mouth: Motives for and consequences of reading customer articulations on the Internet	Hennig-Thurau, T; Walsh, G	International Journal of Electronic Commerce	2003	8	2	390	20,53
Can You Measure the ROI of Your Social Media Marketing?	Hoffman, Donna L.; Fodor, Marek	Mit Sloan Management Review	2010	52	1	383	31,92
Usage, barriers and measurement of social media marketing: An exploratory investigation of small and medium B2B brands	Michaelidou, Nina; Siamagka, Nikoletta Theofania; Christodoulides, George	Industrial Marketing Management	2011	40	7	371	33,73
What drives consumers to spread electronic word of mouth in online consumer-opinion platforms	Cheung, Christy M. K.; Lee, Matthew K. O.	Decision Support Systems	2012	53	1	368	36,8
Social media as a destination marketing tool: its use by national tourism organisations	Hays, Stephanie; Page, Stephen John; Buhalis, Dimitrios	Current Issues in Tourism	2013	16	3	363	40,33
What makes a useful online review? Implication for travel product websites	Liu, Zhiwei; Park, Sangwon	Tourism Management	2015	47		360	51,43
From Social to Sale: The Effects of Firm-Generated Content in Social Media on Customer Behavior	Kumar, Ashish; Bezawada, Ram; Rishika, Rishika; Janakiraman, Ramkumar; Kannan, P. K.	Journal of Marketing	2016	80	1	300	50
Managing Customer Relationships in the Social Media Era: Introducing the Social CRM House	Malthouse, Edward C.; Haenlein, Michael; Skiera, Bernd; Wege, Egbert; Zhang, Michael	Journal of Interactive Marketing	2013	27	4	300	33,33
A Thematic Exploration of Digital, Social Media, and Mobile Marketing: Research Evolution from 2000 to 2015 and an Agenda for Future Inquiry	Lamberton, Cait; Stephen, Andrew T.	Journal of Marketing	2016	80	6	285	47,5

Title	Authors	Source Title	Year	Vol	Issue	Total Citations	Average per Year
Mobile Marketing in the Retailing Environment: Current Insights and Future Research Avenues	Shankar, Venkatesh; Venkatesh, Alladi; Hofacker, Charles; Naik, Prasad	Journal of Interactive Marketing	2010	24	2	279	23,25
Social Internet Sites as a Source of Public Health Information	Vance, Karl; Howe, William; Dellavalle, Robert P.	Dermatologic Clinics	2009	27	2	267	20,54
Personalized Campaigns In Party-Centred Politics: Twitter and Facebook as arenas for political communication	Enli, Gunn Sara; Skogerbo, Eli	Information Communication & Society	2013	16	5	266	29,56
Patterns of cooperation during new product development among marketing, operations and R&D: Implications for project performance	Olson, EM; Walker, OC; Ruekert, RW; Bonner, JM	Journal of Product Innovation Management	2001	18	4	259	12,33
Marketing through Instagram influencers: the impact of number of followers and product divergence on brand attitude	De Veirman, Marijke; Cauberghe, Veroline; Hudders, Liselot	International Journal of Advertising	2017	36	5	250	50
Social media marketing efforts of luxury brands: Influence on brand equity and consumer behavior	Godey, Bruno; Manthiou, Aikaterini; Pederzoli, Daniele; Rokka, Joonas; Aiello, Gaetano; Donvito, Raffaele; Singh, Rahul	Journal of Business Research	2016	69	12	232	38,67
The Effect of Customers' Social Media Participation on Customer Visit Frequency and Profitability: An Empirical Investigation	Rishika, Rishika; Kumar, Ashish; Janakiraman, Ramkumar; Bezawada, Ram	Information Systems Research	2013	24	1	222	24,67
Influencing the online consumer's behavior: the Web experience	Constantinides, E	Internet Research	2004	14	2	215	11,94
Mobile Marketing: A Synthesis and Prognosis	Shankar, Venkatesh; Balasubramanian, Sridhar	Journal of Interactive Marketing	2009	23	2	210	16,15
The impact of social and conventional media on firm equity value: A sentiment analysis approach	Yu, Yang; Duan, Wenjing; Cao, Qing	Decision Support Systems	2013	55	4	209	23,22
Investigation of Social Media Marketing: How Does the Hotel Industry in Hong Kong Perform in Marketing on Social Media Websites?	Chan, Nga Ling; Guillet, Basak Denizci	Journal of Travel & Tourism Marketing	2011	28	4	209	19
Elements of strategic social media marketing: A holistic framework	Felix, Reto; Rauschnabel, Philipp A.; Hinsch, Chris	Journal of Business Research	2017	70		208	41,6
Challenges and solutions for marketing in a digital era	Leeflang, Peter S. H.; Verhoef, Peter C.; Dahlstroem, Peter; Freundt, Tjark	European Management Journal	2014	32	1	198	24,75
The Effectiveness of Branded Mobile Phone Apps	Bellman, Steven; Potter, Robert F.; Treleaven-Hassard, Shiree; Robinson, Jennifer A.; Varan, Duane	Journal of Interactive Marketing	2011	25	4	185	16,82
Sentic patterns: Dependency-based rules for concept-level sentiment analysis	Poria, Soujanya; Cambria, Erik; Winterstein, Gregoire; Huang, Guang-Bin	Knowledge-Based Systems	2014	69		178	22,25

Title	Authors	Source Title	Year	Vol	Issue	Total Citations	Average per Year
Social Commerce: A Contingency Framework for Assessing Marketing Potential	Yadav, Manjit S.; de Valck, Kristine; Hennig-Thurau, Thorsten; Hoffman, Donna L.; Spann, Martin	Journal of Interactive Marketing	2013	27	4	176	19,56
Diffusion and success factors of mobile marketing	Scharl, Arno; Dickinger, Astrid; Murphy, Jamie	Electronic Commerce Research and Applications	2005	4	2	176	10,35
Marketing in Computer-Mediated Environments: Research Synthesis and New Directions	Yadav, Manjit S.; Pavlou, Paul A.	Journal of Marketing	2014	78	1	175	21,88
SoCoMo marketing for travel and tourism: Empowering co-creation of value	Buhalis, Dimitrios; Foerste, Marie	Journal of Destination Marketing & Management	2015	4	3	171	24,43
The website design and Internet site marketing practices of upscale and luxury hotels in Turkey	Baloglu, S; Pekcan, YA	Tourism Management	2006	27	1	161	10,06
The impact of e-service quality, customer satisfaction and loyalty on e-marketing: Moderating effect of perceived value	Chang, Hsin Hsin; Wang, Yao-Hua; Yang, Wen-Ying	Total Quality Management & Business Excellence	2009	20	4	157	12,08
Advertising Content and Consumer Engagement on Social Media: Evidence from Facebook	Lee, Dokyun; Hosanagar, Kartik; Nair, Harikesh S.	Management Science	2018	64	11	155	38,75
If you love something, let it go mobile: Mobile marketing and mobile social media 4x4	Kaplan, Andreas M.	Business Horizons	2012	55	2	155	15,5
The early bird catches the news: Nine things you should know about micro-blogging	Kaplan, Andreas M.; Haenlein, Michael	Business Horizons	2011	54	2	154	14

Results found	1744
Sum of the Times Cited	31962
Average Citations per Item	18,33
h-index	79

Source: Own research

For creating the network map, we followed up on an analysis routing (Miskiewicz, 2020) in VOSviewer:

1. Type of analysis – co-occurrence,
2. Counting method – full counting,
3. Unit of analysis – author keywords,
4. The minimal number of keyword occurrences in the names, keywords, and abstracts of the chosen documents – 5, but we increased this number to 10. Thus, out of 3998 keywords, 61 meet the threshold. Moreover, all keywords were added to the analysis.

Figure 6 depicts the results of the network map bibliometric analysis, which revealed eight clusters. The first red cluster contains 14 items. Big data, China, communications, digital marketing, e-marketing, electronic marketing, market orientation, marketing, marketing strategy, online marketing, SMEs, social media, technology, and tourism were all mentioned. This cluster was directly related to digital marketing. The second cluster includes 12 items relating to branding, customer behaviour, social networks, and commerce. The third cluster contains seven items. This cluster was built around the concept of social media marketing. Advertising was demonstrated in the fourth cluster. Cluster 6's main focus is content analysis and marketing. Cluster 7 contrasted various mobile marketing concepts. COVID-19 and Sustainability were linked to Cluster 8. When the authors are examined in terms of bibliometric coupling, it is seen that they form 3 clusters.

According to Krishen et al. (2021), digital marketing studies separated the major substantive areas that were a business, management, and accounting (25%), computer science (23%), social sciences (15%), engineering (7%), decision sciences (6%), economics, econometrics and finance (5%), psychology (3%), and others (16%). Our findings demonstrated similar results. We emphasized that digital marketing studies are the field of interactive as an international and interdisciplinary field of research.

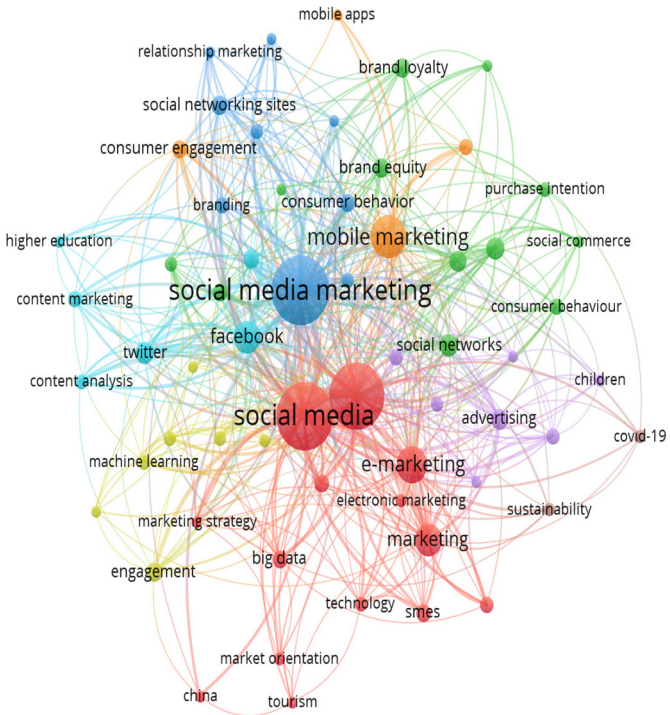

Figure 6. The Network Map Bibliometric Analysis of Digital Marketing

Source: Own research

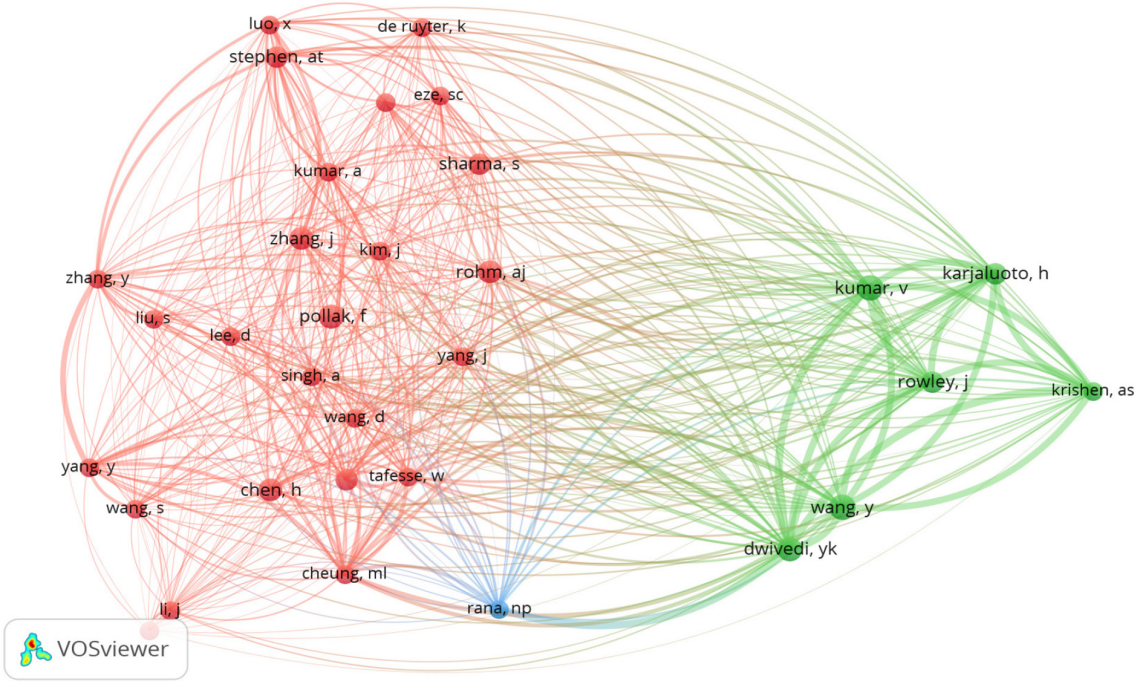

Figure 7. The Bibliometric Coupling of Digital Marketing

Source: Own research

5. CONCLUSION

This study seeks to comprehend the evolution of digital marketing and to identify potential areas for future research. According to Faruk, Rahman, and Hasan (2021), the growth in the field of digital marketing research began in 2014. According to our findings, studies on digital marketing began to increase rapidly in 2008 and after, particularly after 2015. This rapid growth is expected to continue in tandem with the digitalization of our lives. As digital diffusion increases, scientists will conduct studies focusing on different aspects of this field. Therefore, digital marketing is a field of study that constantly renews itself and creates research gaps. The first three areas where digital marketing studies are examined most intensively are business, management, and information systems and science. These areas are extremely comprehensive and have unclear boundaries.

This study is limited to a bibliometric study of digital marketing. The bibliometric study utilizes SSCI, ESCI and SCI-Expanded as databases for collecting data, which may have led to excluding publications from other databases. This may have led to some biases. To remove this bias, future studies might wish to use various databases. In addition to the keyword "Digital Marketing," we also used other closely related terms like "Social Media Marketing," "Mobile Marketing," "Electronic Marketing," and "E-Marketing" in order to collect data. In future research, these closely related terms can be developed in accordance with the needs of the field.

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Development of Human Capital Quality Based on Quantitative Indicators

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Keywords:
Indicators of human capital;
Composite indicator;
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Abstract: *Human capital represents the knowledge, skills and characteristics of an individual that facilitate the creation of personal, social and economic well-being. Measuring, analyzing and subsequently developing human capital is a prerequisite for the region's prosperity. Human capital is a set of human abilities and skills that has a direct impact on the potential of social activity. Measuring and monitoring human capital development is an important part of regional policy. This process is complex because human capital is a qualitative characteristic of man. The links, correlations and causal links between the different sets of human resources data are identified. The assessment of human capital levels must be based on many quantitative indicators. This paper evaluates the development of human capital in Slovakia using an aggregated, composite indicator. The composite indicator is constructed using selected weighted indicators. By applying more complex multidimensional statistical methods, the assessed indicators are aggregated into a composite indicator, and its development is then evaluated.*

1. INTRODUCTION

According to the OECD (2001), the term human capital includes the knowledge, skills and characteristics of individuals that facilitate the creation of personal, social and economic well-being. Investment in human capital, both private and public, is essential for the region's prosperity. These investments include investments in formal education (early childhood, formal school system, adult training programs), but also non-formal education (in the workplace), work experience and health.

In the theory of economic growth, human capital is considered one of the basic inputs. Economic growth is modeled by a production function that includes both physical and human capital (Jones, 2016). In statistical decomposition, education is considered to be one of the main inputs of human capital. Human capital is strongly correlated with other growth indicators, such as innovation and the state of economic and political institutions.

In the second half of the 20th century, several forms of capital began to be defined. According to Veselý (2006), we distinguish between capital: natural (natural resources, soil, forests, minerals, air…), physical (material means of production created by humans), financial (stocks, bonds), social (social networks between people and mutual trust, and between them), cultural (books, computer software, cultural and social needs) and human capital.

Human capital is the sum of all knowledge, skills, qualifications, patterns of behavior, values and motivations that exist in society. These items are difficult to measure and quantify investment in human capital. They represent monetary and non-monetary expenditures that in some

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way contribute to increasing the level of human capital in society. Examples of investment in human capital are an investment in education, training, science and research.

The entry of the concept of human capital into economic theory has been affected by the availability of databases with empirical data. The databases contain data on countries around the world. In addition to basic macroeconomic and demographic indicators, they include variables from education and health care. Also the emergence of measures and studies quantifying the level of knowledge and skills of individuals. Becker (1992) states that government spending on higher education stimulates the economy to a greater extent than government spending on average. Research spending has positive and lasting effects on production. Human capital contributes to the prosperity of society directly - by increasing labor productivity and enabling faster adoption of technology. However, the consequences of its work in other areas of social life that indirectly contribute to the performance of the national economy are also important - improving the health level of the population, improving the quality of interpersonal relationships, creating an environment of greater motivation and civic participation, reducing social exclusion.

The quantification of human capital in individual regions is very important for the direction of regional policy in the country. The assessment of this phenomenon at the regional level is absent in the official indicators, only country-wide values are given. The article presents a simple model for assessing the level of human capital at the regional level.

2. MEASUREMENT OF HUMAN CAPITAL

Quantification of human capital is a complex process. Measures of human capital can serve many purposes as human capital is a key indicator of the current and future potential of a country and its individuals. In most countries, human capital is the largest form of wealth. (Lange et al., 2018; Managi and Kumar, 2018). Countries with a relatively young population can have significant advantages over countries with older populations over the longer term. Within the context of sustainable development, human capital measures can be used to gauge how well a country is managing its total national wealth and to assess its long-term sustainability (UNECE, 2009). There are both monetary and non-monetary, including subjective, ramifications of the level of human capital. Most recently, human capital is frequently applied to inform 'beyond GDP' discussions, since its distribution across households and individuals and the non-economic benefits due to its investment are among the crucial determinants of people's 'quality of life' (Liu, Fraumeni, 2020). Currently, existing human capital measures can be divided into two broad categories: the indicators-based and the monetary measures.

2.1. Monetary-based Measures Projects

In the World Bank´s previous works, human capital was not measured explicitly but included in a residual resulting from deducting produced capital, natural capital, and net foreign assets from the total national wealth that was calculated as the present value of future consumption. (World Bank, 2011) Human Capital is now measured by applying a lifetime income approach, based on a database developed by World Bank. Currently, two projects are preferred: The Changing Wealth of Nations (CWON) and Inclusive Wealth Report (IWR) (Liu, Fraumeni, 2020). Both CWON and IWR projects provide an estimate of human capital per capita. The IWR project computes human capital for the whole population. CWON computes human capital for those who earn labor income. A detailed description of the method of quantification of

human capital can be found in the work A Brief Introduction to Human Capital Measures (Liu, Fraumeni, 2020).

2.2. Indicators-based Measures Projects

The Human Capital Index (HCI) is an international metric that benchmarks key components of human capital across countries. The HCI highlights how current health and education outcomes shape the productivity of the next generation of workers. In this way, it underscores the importance for governments and societies of investing in the human capital of their citizens. The HCI was launched in 2018 as part of the Human Capital Project. Over the past decade, many countries have made important progress in improving human capital. Today, however, the COVID-19 pandemic threatens to reverse many of those gains. Designing the necessary interventions, targeting them to achieve the highest efficiency, making investing in better measurement of human capital is more important than ever.

The components of the HCI are combined into a single index by first converting them into contributions to productivity relative to a benchmark of complete education and full health. Multiplying these contributions to productivity together gives the overall HCI.

New measures of human capital are based on realistic rates of return to education, which are allowed to vary substantially across countries. In OECD samples, coefficient estimates are broadly consistent with the private returns underlying the construction of the new measures of human capital (Botev, 2019).

There are currently three ways to assess human capital, World Bank´s Human Capital Index (WB HCI), United Nations´ Human Development Index (UN HDI) and United Nations Development Programme (UNDP). Comparison of these selected characteristics among different human capital indexes are in (Liu, Fraumeni, 2020).

All of these approaches to measuring human capital are based on country-wide data. For regional policy, it is necessary to be able to estimate the potential of the region in terms of human capital. In this case, there is no single methodology for measuring human capital, for example at the NUTS 3 level. The paper presents one of the possible approaches to this issue. An aggregated composite indicator is constructed, using the method of The Performance Interval of Composite index.

3. CONSTRUCTING A COMPOSITE INDEX (*CI*)

This phenomenon needs to be quantified to compare regions in terms of human capital quality. Some approaches to this issue have been mentioned in the previous section. The HCl index and its variations are characterized by the common term composite index. The composite index is an indicator that is constructed from several sub-indicators that evaluate the region from different perspectives. It summarizes and completes the view of such multifaceted phenomena as human capital, social inclusion, knowledge economy, and competitiveness. However, the summarization process inevitably leads to the loss of some basic information. If several sub-indicators enter into the aggregation, it may happen that in the comparison of two regions the first country is better according to one indicator and the second country is better in comparison with another indicator. In the absence of a good composite index, excessive public attention can again

be focused on only one or a few dimensions, thus canceling the original intention to portray a multidimensional phenomenon. In fact, this could undermine the credibility of the regions' assessment (Micklewright, 2001).

3.1. Properties of the Composite Index

The assessment of human capital in the region must take into account the purpose, choice of method and its correct application. It is important to select the indicators for their evaluation, the way they are integrated and the correct interpretation of the results. It is important to select the indicators for their evaluation, the way they are integrated and the correct interpretation of the results. The number of indicators should be neither small (distorted real situation) nor too large (loss of clarity and transparency of interpretation). Indicators must be regularly measured and officially published.

There are currently several ways to calculate it. Multidimensional statistical-analytical methods or simpler statistical-descriptive. Multidimensional methods are used in the construction of summary indicators to find the optimal number of input indicators, their reduction and reveal the similarity of the examined objects, and weight assignment (cluster analysis, correlation analysis and principal components analysis).

Methods are used to normalize the input indicators: Normalization based on interval scales, Standardization z-scores, Min-Max, Distance to a reference, Indicators above or below the mean, Methods for cyclical indicators and Percentage of annual differences over consecutive years. The weight of the indicator can be determined by subjective methods (expert decision, point method) or by objective methods (Equal weighting, Principal component analysis, Benefit of the doubt, Unobserved components models, Budget allocation process, Analytic hierarchy process, Conjoint analysis). There is no single approach to aggregating individual indicators into a single aggregate. Saisana and Tarantola (2002) present several aggregation techniques, we divide them according to the way of including input indicators in the calculation into linear, geometric and multicriteria.

3.2. Classical construction of a Composite Index (*CI*)

For this reason, the OECD (2008) methodologically described the ten-step process of creating a composite indicator. Handbook discussed the following steps in the construction of composite indicators: theoretical framework, data selection, imputation of missing data, multivariate analysis, normalization, weighting and aggregation, back to real data, links to other variables and visualization.

The basic mathematical model of construction is as follows. There exists a set of units (regions) $I = \{1, \dots, n\}$ to be evaluated concerning the set of dimensions $J = \{1, \dots, m\}$ (in our case dimension is input indicator), the value of which are x_{ij}. For each unit $i \in I$, represents a vector $\boldsymbol{x}_i = [x_{ij}, \dots, x_{im}]$ group of the values assigned to that unit in the dimensions from J and vector $\boldsymbol{y}_i = [y_{ij}, \dots, y_{im}]$ is its normalization. The weight w_j is specified for each dimension $j \in J$, such that $w_j \geq 0$ for all $j \in J$ and $\sum_{j=1}^{m} w_j = 1$. Given a weight vector $\boldsymbol{w} = [w_1, \dots, w_m]$, the formula for calculating the composite indicator for each unit $i \in I$ is:

$$CI(\boldsymbol{x}_i, \boldsymbol{w}) = \sum_{j=1}^{m} y_{ij}\, w_j \qquad (1)$$

3.3. The Performance Interval Approach to Construction *CI*

Mazziata and Pareto (2020) presented another approach to the use of the *CI*. In their work, they describe certain disadvantages of describing multidimensional objectivity by a single number. Instead of one number, they recommend constructing an interval, which they called ´performance interval´. The one-number description approach is called the compensatory approach. In the case of a description of reality, the ´performance interval´ would refer to the non-compensatory approach. The approach to aggregation is referred to as ´compensatory´ or ´non-compensatory´. Additive methods can be used for aggregation, in the case of a compensatory approach. Otherwise, it is recommended to use non-linear functions, such as the geometric mean (OECD, 2008). Most aggregation functions summarize the weighted and normalized values of the input indicators. Additive and multiplicative aggregation functions are described in detail in the work of Mazziata a Pareto (2002). If the composite index to be constructed is ´positive´, for instance, socio-economic development, a downward penalization must be used. Therefore, increasing values of the index correspond to an improvement of the examined phenomenon. A partially compensatory approach is recommended; the aggregation function is the geometric mean

$$CI(\boldsymbol{x}_i, \boldsymbol{w}) = \prod_{j=1}^{m} y_{ij}^{w_j} \tag{2}$$

Based on these facts, it is recommended to construct the ´performance interval´ of the composite index, rather than a single value. This interval is bounded by a lower (LB) and upper (UB) boundary. It is constructed depending on the level of compensability of individual indicators. The formula for ´positive´ performance interval is

$$\left(\min_j (y_{ij});\ \sum_{j=1}^{m} y_{ij} w_j\right) \tag{3}$$

and for ´negative´ performance interval is

$$\left(\sum_{j=1}^{m} y_{ij} w_j; \max_j (y_{ij})\right) \tag{4}$$

The longer the length of this interval, the greater the imbalance between the input indicators. If an object has all the indicators rated the best, compared to other objects, the interval is narrowed to one number. The interval does not depend on how the original values are normalized.

4. THE RESEARCH RESULTS AND DISCUSSION

The selection of appropriate indicators for human capital analysis is based on several recommended sources. The basis is formed by indicators from the World Bank's international data set „World Development Indicators". The HCI Index contains two horizontal themes, Learning and Employment, running across five vertical age group pillars of the Index. Twelve relevant indicators (Statistical Office of the Slovak Republic) at the NUTS 3 level were selected for the assessment of human capital in the regions of Slovakia. The comparison period was 2010 and 2020. The data were recalculated to the population of the region in the given period. Input indicators are: Ratio of pupils to teachers (grammar school, secondary vocational school, primary school), Crude birth rate, Crude death rate, Crude rate of natural increase of population, Crude rate of migration, Economically active population – basic and uneducated, Economically active population – upper secondary, Economically active population – tertiary (academic), Criminal offenses, Gross domestic expenditures on research and development.

We construct a positive performance interval. Its higher value is better for the company. Thus, the adoption of a negative penalty allows lower values of the composite index than the arithmetic average, with the largest changes occurring in the regions with a good life in the monitored indicators. The input values of the analyzed indicators were normalized by the method of standardization (or z-scores), with respect to the polarity of the input indicator. After normalization, it is necessary to assign a weight w_j to the individual indicators j in the process of creating a composite index. In our case, the indicator was assigned the same weight. Thus $w_j = 0{,}083$ for each $j = 1, \ldots, 12$. In the next table are lower (LB) and upper (UB) bound for the composite index. In this case, LB represents non-compensatory index and UB represents the full compensatory composite index. It is listed in table 2 Midpoint (compensatory *CI*) a Geometric mean (non-compensatory *CI*). There is also the order of the regions in both approaches and the calculated coefficient of Spearman's rank correlation. The following outputs compare the years 2010 and 2020.

Table 1. Resulting values of CI in 2010

Regions	Performance		Composite		Rank		
	LB	UB	Midpoint	Geometric Mean	Midpoint	Geometric Mean	difference
Bratislava	76,64	117,35	**97,00**	**113,79**	**5**	**1**	4
Trnava	92,19	110,57	**101,38**	**107,97**	**1**	**2**	-1
Trenčín	87,85	107,44	**97,65**	**105,49**	**4**	**6**	-2
Nitra	85,47	105,51	**95,49**	**105,36**	**7**	**7**	0
Žilina	88,45	107,43	**97,94**	**106,02**	**3**	**5**	-2
Banská By	86,37	106,60	**96,48**	**104,73**	**6**	**8**	-2
Prešov	82,24	108,42	**95,33**	**107,12**	**8**	**3**	5
Košice	87,28	109,43	**98,36**	**106,94**	**2**	**4**	-2

Mean absolute difference = 0, Spearman's rank correlation = 0,31

Source: Own calculation

It is clear from Table 1 that the biggest difference in the positions of both applied approaches are in the regions of Bratislava and Prešov. In the case of Bratislava, this is due to the large width of the performance interval. This region has long had the highest number of children in schools per teacher. This does not mean a good investment in human capital.

The following graph shows the performance intervals and midpoints of human capital for the Slovak regions in 2010. The length of the interval characterizes the balance of individual assessed indicators. The region that has the performance interval of the smallest length shows the best balance of indicators.

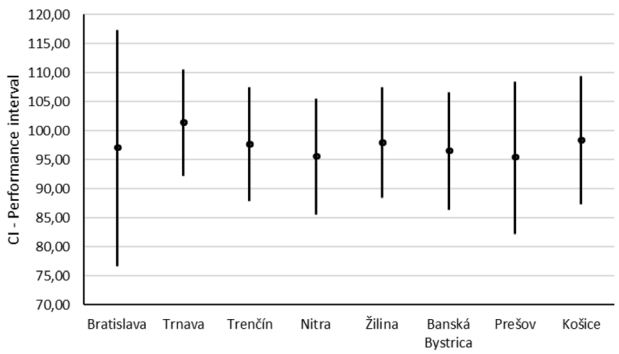

Figure 1. Performance intervals of regions of Slovakia
Source: Own processing

Of the assessed regions, the Trnava region has the most balanced indicators. The largest length of the performance interval is displayed for the Bratislava region. On the contrary, as far as other indicators are concerned, they always come first. Regional policy interventions should be interested in a certain homogeneity of important indicators. The results further show that a region can perform better than another region from a non-compensatory point of view, but it can perform worse from a full compensatory point of view. This is an example of a pair of regions Bratislava - Trnava. In this case, the performance interval of the region is contained within a larger performance interval.

Table 2. Resulting values of CI in 2020

Regions	Performance		Composite		Rank		
	LB	UB	Midpoint	Geometric Mean	Midpoint	Geometric Mean	difference
Bratislava	78,57	118,02	**98,29**	**114,13**	**5**	**1**	4
Trnava	94,42	110,12	**102,27**	**107,56**	**2**	**3**	-1
Trenčín	90,11	106,42	**98,27**	**105,40**	**6**	**7**	-1
Nitra	84,54	105,49	**95,02**	**106,18**	**8**	**6**	2
Žilina	96,02	108,92	**102,47**	**107,97**	**1**	**2**	-1
Banská By	89,52	106,60	**98,06**	**103,82**	**7**	**8**	-1
Prešov	89,76	109,70	**99,73**	**107,42**	**4**	**4**	0
Košice	91,61	108,66	**100,14**	**106,25**	**3**	**5**	-2

Mean absolute difference = 0, Spearman's rank correlation = 0,67

Source: Own processing

Spearman´s rank correlation coefficient is ρ=0,67, with a mean absolute difference of rank of 0 positions. The value of ρ indicates a strong positive relationship. This means that the assessment of a phenomenon using the compensatory approach strongly correlates with the assessment using the non-compensatory approach. The following graph shows the width of the individual performance intervals.

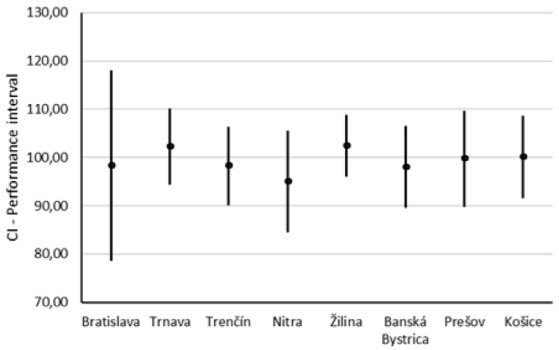

Figure 2. Performance intervals of regions of Slovakia in 2020

Source: Own processing

The comparison of intervals again indicates a large imbalance of input indicators in Bratislava and, conversely, great stability in the Žilina region. The highest value is also in the Žilina region *CI*. Figure 3 shows a comparison of values *CI*, calculated using as a geometric mean. In the observed period, an increase in the value of *CI* can be seen in the regions of Bratislava, Žilina and Prešov. The decline is recorded in the Banská Bystrica Region, which has long had the lowest value. It can be stated that human capital, assessed by selected indicators, has the highest rating in the Bratislava region and the lowest potential of human capital is in the Banská Bystrica region.

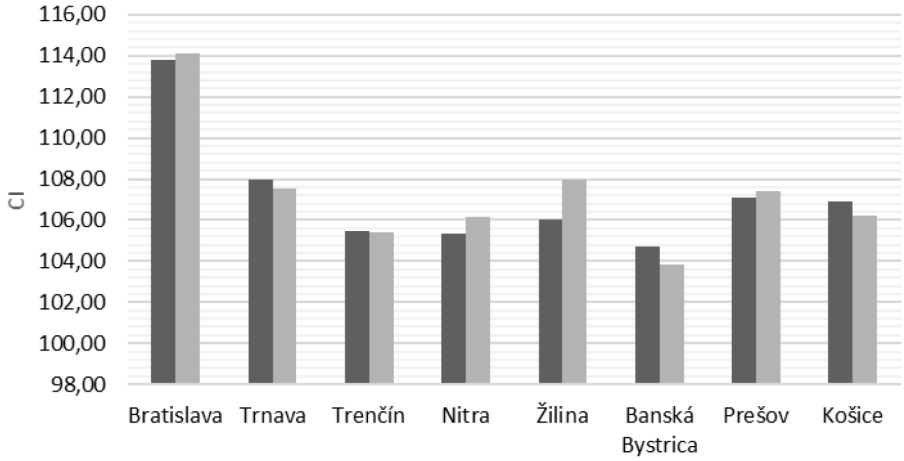

Figure 3. Comparison of CI values in 2010 and 2020
Source: Own processing

5. CONCLUSION

Human capital has a multidimensional nature and requires the definition of a set of individual indicators in order to be properly assessed. The most comprehensive approach to measuring human capital is using a composite index. It represents a single number based on which the assessed regions can be compared with each other. One of the problems in the construction of a composite index is the method of aggregation. The performance intervals allow for overcoming these problems by providing a result that does not depend on the adopted aggregation function. The choice of the level of compensation of the individual indicators are particularly decisive if the horizontal variability of the indicators is high or very high. This innovative approach makes to include all the composite indices of a region within a defined range in which all the values are included as the compensational level varies. In the article, this evaluation approach is applied to the regions of Slovakia. From the point of view of several indicators influencing human capital, the regions of Slovakia are compared at the NUTS 3 level. For a more comprehensive assessment of the level of human capital, it would be appropriate to include more input indicators in the analysis. The article presents the model of human capital evaluation and the process of assessing the development of human capital quality. This provides a new approach to understanding the multidimensional aspects of human capital. The results provide several levels of insight into the investigated phenomenon of human capital, which we describe by composite index.

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Education and Internationalization of Higher Education in Disruptive Times

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Abstract: *In recent years, most countries around the world, particularly in Europe, have mainstreamed internationalization at the national and institutional levels. Europe is seen around the world as a best-practice case for internationalization, but nowadays with significant challenges having to regard the new realities: as the outbreak of the COVID-19 pandemic and the situation in Ukraine, but also the massive impact of the refugees who come over the previous waves of immigrants and which can be meet all over Europe. In this study, we present the tendencies of internationalization in higher education. If, until today, the globalization of economies and societies influenced the internationalization of higher education, today the disruptive times determine the enhanced importance of knowledge to find solutions to these issues. This study presents the pillars of the European internationalization strategy, as regards European Higher Education compared with other regions of the world, and gives a few good-practice cases in internationalization..*

1. INTRODUCTION

Nowadays, economic, political, and social developments are subject to global influences. It is a certainty that globalization has penetrated every sphere of society and public life. On the one hand, this means that borders do not limit ideas and actions, and while disputes can often no longer be solved at the national level, the COVID-19 pandemic and the war in Ukraine prove this.

Despite the multilateral dialogue between states and the economic interdependencies that have culminated in globalization on all levels, there are more and more analysts who consider that the COVID-19 pandemic (and more recently, the war in Ukraine) coincides with the beginning of a reverse process of de-globalization. The crisis generated by the pandemic has exposed the vulnerabilities of the world's economic interdependence, and the war in Ukraine is disturbing the stock markets. That's why analysts, economists, and investors fear that globalization has culminated after 30 years of growth.

Disruption of supply chains, rising costs, and shortages, all these daily realities can be linked to deglobalization. Deglobalization would mark a withdrawal from the process of global economic integration and there are signs that this has been going on for some time. The disruptions caused by the pandemic have provoked a fundamental change in the configuration of supply chains. This has shifted from just-in-time production to stockholding. The result is increased resilience on the supply side, which is a retreat from globalization, with its emphasis on efficiency and profitability.

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Globalization is a direction, long-term process, influenced by the real progress and welfare needs of people, which cannot be reversed, given the effects on the well-being and stability of the world, and of each country. It may be possible to consider in the short to medium term a change of the location of production and a reduction in dependence on certain products and services (such as medical or energy resources), a reorientation or reset of flows of goods, but with bigger costs.

Globalization, besides the Bologna Process, is a powerful force that shaped higher education in Europe and worldwide, and the last wave of globalization stimulated in higher education the progress of advanced technologies, communication, and exchange of knowledge, experiences, and ideas among students, faculty, and administrative staff (Kovacevic et al., 2022, p. 3).

As it is well known, the development of technologies and innovations, with universal applications, makes it impossible to use them only at national borders or to return to the self-sufficiency of national production, therefore it is mandatory to identify concrete and necessary solutions. Along with other institutions, education and especially higher education have an essential role.

2. DISCUSSION

Higher education universities experienced an unprecedented issue starting in 2020: how to maintain internationalization practices and student mobility despite a sudden and complete disruption of international travel. When the COVID-19 pandemic began, national borders were restricted and face-to-face teaching had been suspended, affecting 6 million international students.

Higher education plays a significant role in informing young people to face the complex challenges of a globalized world through internationalization and combining an international and intercultural dimension by studying, teaching, and research.

According to Jane Knight, the internationalization of higher education is the process of integrating an international/intercultural dimension into the teaching, research, and service elements of an institution (Zolfaghari et al., 2009, p. 2).

Whether we are speaking about one or the other of these four reasons, higher education is at its junction, contributing substantially to the development required by the globalization of the world. So, internationalization is a dynamic process involving an international and intercultural dimension; internationalization is not only oriented to countries or national states but also includes different cultural/ethnic groups within a country.

According to Dagen et al., (apud. Kovacevic et. Al, 2022) internationalization is considered to be one aspect of globalization in higher education: “a steerable process of greater cooperation and cross-border formal relations between states, institutions, and organizations in higher education, which includes an international and/or global dimension in the teaching, research, service functions, purpose and delivery of higher education” (p. 5).

Internationalization in higher education is characterized by the importance of international research collaborations between institutions and scholars, the development of an international curriculum, and the mobility of professors and students as well.

Technological advances, and all these new realities, have stimulated a virtual internationalization of higher education, with universities extending their distance education services internationally and experimenting with new ideas like virtual exchange programs.

If before 2020 the growth of MOOCs (massive open online courses) was considered the next big "disrupter" in international education, today the hype seems to have diminished (Beer, 2016). The pandemic required a protracted period to substitute face-to-face activities with online and after two years, we saw that online learning contributed to flexible and continuous programs during the lockdown periods of the pandemic in many countries.

According to Beer (2016), at the beginning of 2022, the tendencies in high education continue toward internationalization of their institutions and share a vision of borderless education transcending political, geographical, and economic divides; however, universities cannot ignore that local conditions in which they operate can impede their ability to operate.

There are countries where academics are under attack from governments fearful that a free exchange of ideas will undermine their regimes (see the situation in Russia). There are entire regions of the world where higher education struggles to survive because of underfunding. Universities are already seeking ways to engage with the growing number of refugees. From the debut of the Ukrainian war, the European Union offers its support to Ukrainian students, young people, teachers, and educators as well.

According to the Commissioner for Innovation, Research, Culture, Education and Youth, Mariya Gabriel, the EU is helping Ukrainian students and educators with the following measures: greatest flexibility in implementing Erasmus+ projects towards Ukrainian students and higher education staff; Erasmus National Agencies to contact individual participants who are in Ukraine or Russia or are planning to leave to these countries within the coming weeks; guaranteed support for Ukrainian students abroad (Erudera College News, 2022).

The European University Association (EUA), which represents over 850 universities and national rectors' conferences in 48 European countries, condemned Putin's aggression against Ukraine and expressed solidarity with students, staff, and all Ukrainian people (European Union Association, 2022). EUA declared that 12 Russian universities which support Russia's aggression towards Ukraine would have their membership suspended; they had done this decision after the Russian Union of Rectors (RUR) published a statement supporting Russia's intervention in Ukraine.

Internationalization in higher education is characterized by the importance of international research collaborations between institutions and scholars, the development of an international curriculum, and the mobility of professors and students as well.

Although higher education institutions across Europe differ, scholars speak of particular models among universities from the German, French, Scandinavian, American, and Eastern European political, administrative, and educational traditions and Israel, for example (Kovacevic et al., 2022, p. 6). Universities now have a diversity of traditional and cultural peculiarities, having differences in purpose, principles, objectives, norms, values; missions, targets, policies, strategies, capacities, resources, internal dynamics, and organizational and governance models.

3. EXAMPLE OF GOOD PRACTICE IN INTERNATIONALIZATION

In the following, we will give a case of good practices provided by the Transilvania University of Brasov (UNITBV), Romania. In the early 1980s, Romania was one of the top 15 providers of academic services for foreign students, with 16,962 international students enrolled in 1981. After 1989, the transition period and regime change were also reversed in Romania's declining market importance of international higher education, but slowly the internationalization process strengthened (Batali, 2010).

According to the Internationalization Strategy of the Transilvania University of Braşov enhancement of the internationalization process is one priority and the achievement of this objective, integrated into the general development strategy, will contribute to the adaptation of the university to the current international context of higher education and a changing environment (Transilvania University of Braşov, unitbv.ro).

The general objective of the internationalization strategy of the UNITBV is to increase the international visibility and quality of education and scientific research processes by expanding cooperation with relevant institutions in European Union countries and outside the European area. Among the most important specific objectives of internationalization are: increasing the number of foreign languages teaching programs (including in partnership with other universities), especially master's and doctoral programs; extending cooperation with foreign companies for internships and internships; supporting and stimulating teachers who teach in foreign language programs; intensifying the university's efforts to stimulate the participation of teachers and students in international skills and cooperation; financial support for a program of internships abroad for young teachers and researchers at the university; improving the accommodation process of international students, by involving Romanian staff and students in their process of adapting to the life of the university and the city; intensifying attracting specialists, teachers and students from abroad to carry out activities within the University of Transylvania.

The Transilvania University of Braşov is affiliated and cooperates with many institutions such as the European University Association, Agence Universitaire de la Francophonie, Danube Rectors Conference, European University Foundation, Open innovation academic network, European University-Enterprise Network, Erasmus for young entrepreneurs, Enterprise Europe Network, International Union of Forestry Research Organizations, Conference of Deans and Directors of European Forestry Faculties and Schools, Silkroad University Network, The network of excellence of intuition. UNITBV has traditional partnerships with the Confucius Institute, French Lecturer, Center for Modern Languages, Agence Universitaire de la Francophonie, and Deutscher Akademischer Austauch Dienst (Affiliations and Cooperation, www.unitbv.ro).

At the end of 2021, Transilvania University of Braşov has 645 partner institutions, and universities, with which it performs cooperation activities provided by framework partnership agreements, by the European Erasmus + and CEEPUS programs; the university's partners come from 84 countries around the world. The university has approximately 500 agreements with universities in Europe, 78 partners in Asia, 20 agreements with universities in South America, 22 agreements with universities in North America, and 13 agreements with universities in Africa.

With 512 of the 645 partner institutions, Transilvania University of Brasov's actions is being realized under the Erasmus + mobility program, both with the program countries (KA103 /

KA131) and with the partner countries (KA107). The number of partner countries is 138 universities in 45 countries, which is a considerable increase over the previous years; an important role in achieving this result was played by the programs initiated and supported by the university from its funds, which encouraged the international mobility of members of the academic community and led to the settlement of new collaborations, especially with European institutions.

In 2021, a total of 407 full-time international students from 76 countries were enrolled (from Africa, America, Asia, and Europe); of these 93 students arrived on Erasmus + mobility and 5 students came on mobility based on bilateral agreements (from Xi'an International Studies University, China). In 2021 at Transilvania University in Brasov there were 89 students in the mobility of studies (among them from Spain - 28 students, from Turkey - 22 students, from France - 16 students, from Italy - 11 students), and 4 students in the mobility of practice.

The students of the Transilvania University of Brasov performed, in 2021, 171 international mobilities (62 participated in international artistic activities, 47 study mobilities, 32 practice mobilities, 17 participated in international student competitions and contests, 5 study internships, 2 participated in specialization courses/summer schools, 2 research internships, 4 mobilities).

The outgoing mobilities, in the same interval, are presented: 127 teachers of the Transilvania University of Brasov and researchers were in 195 international mobilities; so, there were 47 documentation/research internships, 42 project activities, 40 Erasmus + teaching and professional training activities, 36 scientific events (conferences, congresses), 17 participations in sports competitions / artistic events to promote the university, 9 university promotion activities, 2 participations in external evaluation commissions or doctoral commissions, 2 summer courses/ schools, 1 participation in CEEPUS activities.

In terms of incoming mobility, in 2021, it was carried out: 51 teachers from abroad visited UNITBV for the following activities: 15 out of 10 countries - participated in conferences, symposia, workshops, summer schools, 31 out of 12 countries - participation in study visits, teaching, artistic events, 5 out of 2 countries - participation in educational or research projects.

Referring to the financing of international collaborations, the main programs for international mobility of UNITBV students and staff were: Erasmus + Programs, International Projects carried out by UNITBV, CNFIS-FDI-2021-0214 Institutional Development Project: "Internationalization at home" which aims to create a culture of continuous international interaction at the Transilvania University of Brasov, UNITBV Scholarship for teachers and researchers. Other international mobility programs at UNITBV, funded by the university, were in 2021: "Transilvania Academica Scholarship" (64 out of 31 countries), "Rector's Guest" (12 out of 2 countries), "Guests of Transilvania University" (10 from 6 countries), "Keynote speaker" (1 from 1 country), "Transilvania fellowship" - Transilvania Fellowship for Postdoctoral Research / Young Research (3 out of 2 countries).

From the data offered above, we can notice that despite the pandemic of COVID-19, Transilvania University of Brasov continued the internationalization process, even if it limited the specific mobility for a quite long period. The university has shown good resilience to partners, professors, and students as well, who had the initiative to take part in the internationalization process.

Israel offers another example; internationalization has been and is regarded as a key objective by Israeli academics, with both the purpose of attracting talented individuals from all across

the world and improving Israeli schools' international image. Internationalization has been valued not just from an academic standpoint, but in terms of Israel's diplomatic and economic contacts with other nations.

The ratio of overseas people studying in Israel is now about 1.4 percent, which is much lower than the OECD average of 6 percent. This is due to a variety of reasons, mainly linguistic limitations (the majority of tuition within Israeli universities being given in Hebrew) and legal obstacles, such as visa and job requirements (Council for Higher Education, https://che.org.il/en/strengthening-internationalism-higher-education/).

In 2017, Israel enrolled 11.000 international students, accounting for 3% of the country's total university students. Israel, on the other hand, welcomes fewer international students than it sends. In Israel, there is less than one international student (0.74) for every native student studying abroad, which is significantly lower than the OECD average (4:1). The United States (20%), the Russian Federation (14%), and France are the countries with the most international students in Israel (10%) (OECD iLibrary, 2019, https://www.oecd-ilibrary.org/education/education-at-a-glance-2019_f8d7880d-en, p. 3).

Quantitative objectives for foreign enrollments have been set as part of the Planning and Budgeting Committee's internationalization agenda, with an expectation of roughly 24,000 international students studying in Israel by 2022, compared with an average of 11,000 overseas students in 2017 (Council for Higher Education, https://che.org.il/en/strengthening-internationalism-higher-education/).

Throughout 2017 and 2022, the Planning and Budgeting Committee (PBC) has established a variety of quantitative targets for foreign student enrollment, as follows: a 120 % growth in the percentage of international postdoctoral students, a 60% increase in the number of international doctoral students, a 100% increase in the number of international master's degree students, a 30% rise in the number of international bachelor's degree students. In addition, the number of international students enrolling in short-term programs has increased by 150 percent by participating in summer classes, semesters abroad, and so on (Council for Higher Education, https://che.org.il/en/strengthening-internationalism-higher-education/).

The Israeli Council for Higher Education (CHE) has started a Studying in Israel project intending to raise the number of overseas people studying in Israeli academic institutions (Leichman, 2019).

The Higher Education Council and the Planning and Budgeting Committee (PBC) established, starting with the academic year of 2011, an educational program as an important element of undergraduate education, which would be offered beyond the student's primary field. They described it as a significant instrument for defining the grownup form of the undergraduate as an intelligent person with knowledge in a variety of fields, far beyond the sphere of knowledge in which the undergraduate has been studying. As for the period from 2017 to 2022, the PBC has set aside more than $100 million to improve internationalization in Israel's higher education system. The money primarily supports internationalization inside Israeli higher education institutions as well as international student scholarship programs (Council for Higher Education, https://che.org.il/en/תתו-גלמ-תלהנה/quality-assessment-division-qad-2/וושארה-ראותה-תרגסמב-הרשעה-ידומיל/).

Moreover, the Planning and Budgeting Committee (PBC), in collaboration with the Ministry of Finance, promotes the growth and presence of enhancement classes within the area of economic education in the context of undergraduate studies in government-financed universities.

Among the CHE/ PBC's efforts to advertise internationalization are: establishing national aspirations for internationalization; guiding a nationwide strategy to produce and label Israel as a desirable student destination; improving the efficiency of academic norms and attempting to remove restrictions on foreign students and researchers coming to Israel (such as visas, work permits, and so on); and trying to publicize academic ties with other nations (Council for Higher Education, https://che.org.il/en/strengthening-internationalism-higher-education/).

4. CONCLUSION

Given ongoing issues, the internationalization of higher education demands communication skills, rationality, creative thinking, active participation, collective action, tolerance of each other, acceptance of criticisms, and a scientific approach.

Now more than ever, the internationalization of higher education demands tolerance and international cooperation in academic activities and plans to generate science. Based on this, the internationalization of higher education despite culture, geography, and regional policies should pay attention to that: *We are human*; to encourage the knowledge and realization of cultures and affirming mutual respect; the achievement of necessary skills, tolerance, and learning from others; to prove flexibility in facing cultural affairs; to realize the necessity of the constructive approach to solving international issues (Zolfaghari et al., 2009, p. 4).

Internationalization in higher education is a must and "if we want to resist the powers which threaten to suppress intellectual and individual freedom we must keep clearly before us what is at stake… Without such freedom, there would have been no Shakespeare, no Goethe, no Newton, no Faraday, no Pasteur, and no Lister" (Albert Einstein at the Royal Albert Hall, 1933; CARA, a lifeline to academics at risk, https://www.cara.ngo/who-we-are/).

After this long period of the pandemic, internationalization of the universities is continuing; this period has shown that it can gear academic programmes and collaborations towards 'virtual internationalization', meaning that home students can interact virtually with peers at international universities and professors or researchers in their field of study. The reports show students started now to apply again to enjoin to study or other types of mobilities in different institutions abroad.

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High School Education during the COVID-19 Pandemic

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Abstract: *The coronavirus infection originated in Wuhan, China, and soon spread around the world. The declared COVID-19 pandemic has affected almost all aspects of modern society. This paper examines the impact of the COVID-19 pandemic on secondary education and student achievement in the state graduation exam. Secondary education of the students in Croatia has adapted to the new situation with the school closure, online teaching and with the adaptation of teaching methods. The purpose of the state graduation exam is to assess and evaluate the achieved knowledge and competences, acquired by education in accordance with general education teaching plans and programmes. For this reason, in this research, an analysis of student performance in the state graduation exam was conducted. The results of the exam of the compulsory part of the state graduation exam in the summer exam period from the school year 2012/2013 until 2020/2021 were observed. In this paper, the impact of the COVID-19 pandemic on secondary education was examined from several different aspects. According to the analyzed indicators, the results showed that there is no significant decline in the successful adoption of teaching materials, i.e. there is no reduction in the number of students who successfully passed the state graduation exam. Furthermore, the share of students who passed the state graduation exam within sufficient grades was analyzed, and the results showed that there is no major decline. Lastly, the share of students who passed the state graduation exam and enrolled in some form of higher education was analyzed. The results showed that the number of students who enrolled in some of the study programs of higher education institutions did not decrease.*

1. INTRODUCTION

At the time when COVID-19 disease appeared in Wuhan, China, no one knew how much the disease would affect the lives of all people around the Earth. "COVID-19 is a disease caused by a coronavirus, and it has been named a new type of coronavirus 2019-nCoV" (Bender, 2020). The first infected people appeared in December 2019, and within a few months the infection spread around the world, and on March 11, 2020, the World Health Organization (WHO) declared a pandemic. According to Yan (2020), the scale of the pandemic is indicated by the fact that this pandemic is "comparable in its wide scope and impact with World War II or the Great Depression". Among the different types of influences on public health, economic, political, educational and many other sectors of modern society, one unique influence stands out and that is maintaining a physical distance. Consequently, different types of human social interactions (shopping, banking, education, business meetings and entertainment) moved from dominantly offline to dominantly online (Yan, 2020). According to UNESCO (2020), "in April 2020, 91.3% of students in 188 countries were affected by changes in schooling due to the spread of COVID-19 disease."

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The outbreak of the COVID-19 pandemic affected all segments of education, primary, secondary and higher education. Many countries have closed schools and colleges due to the COVID-19 pandemic. „Mathematical models and empirical analyses of reactive closures in past pandemics show that closing schools reduces the total number of cases in the community by about 25 percent and postpones the peak of the pandemic by a week or two, which is helpful“ (Christakis and Christakis, 2020).

Figure 1 shows how many weeks the schools were closed in certain countries of the world. The Republic of Croatia completely closed schools for 10 weeks for all students, after which it opened only for students from 1st to 4th grade of primary school.

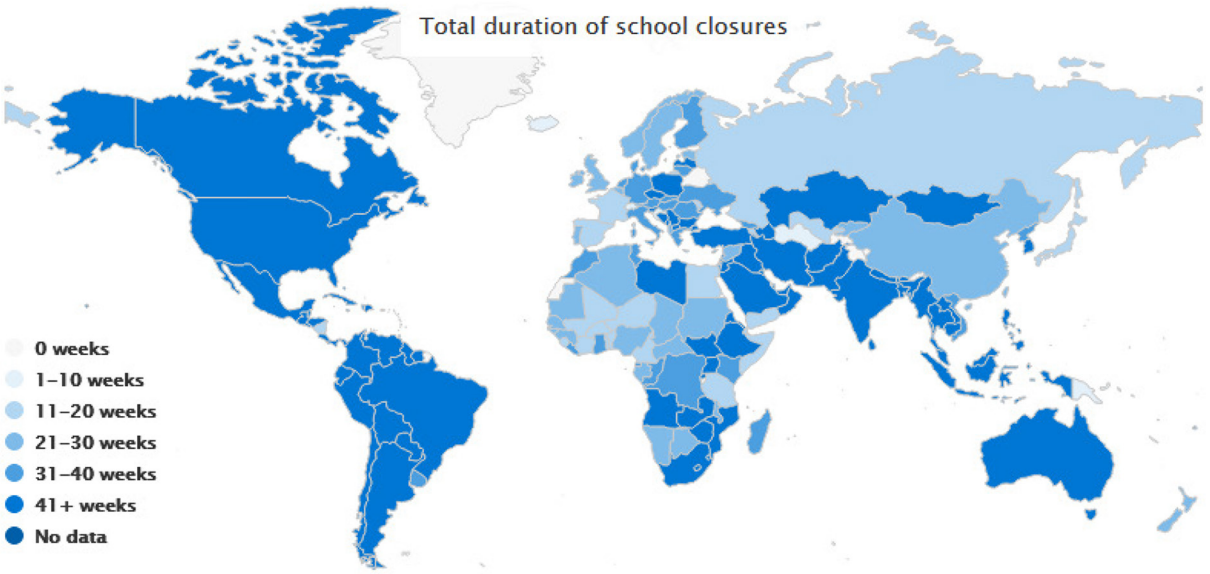

Figure 1. School closure time due to COVID-19 pandemic
Source: https://en.unesco.org/covid19/educationresponse

The education system had to adapt very quickly to the current situation, so teaching methods changed. Measures introduced to prevent the spread of the infection had an impact on the implementation and organization of classes. Classes were organized through various platforms where online teaching methodology was adopted, and the most commonly used were Zoom, Meet, MS Teams, Yammer and others. Students were isolated from their usual surroundings, separated from society and forced to stay at home and attend classes. The success of these adjustments, with a certain margin, can be assessed based on the results of the exams that students write at the end of a certain level of education. The results of the state graduation exam in the Republic of Croatia can be a good indicator of the success of the adjustment of the secondary school system.

This paper is divided into four chapters. In the first chapter, introductory considerations are given and the research problem is described. The second chapter describes the system of secondary education in the Republic of Croatia with special emphasis on the procedure of conducting the state graduation exam. The third chapter presents the results of the analysis of the performance of high school students according to various indicators. In the fourth chapter, concluding remarks are given.

2. HIGH SCHOOL EDUCATION IN THE REPUBLIC OF CROATIA

Secondary education in the Republic of Croatia is not compulsory. Secondary schools, according to the type of educational program, are divided into general education, vocational and art schools. Secondary education lasts mostly four years, while some programs last three and some five years. Students of four-year and five-year vocational programs complete their secondary education by defending their final thesis, while general-education high school programs with passed exams are an obligatory part of the state graduation exam. The state graduation exams are conducted at the same time with the same conditions and criteria for all students who take the state graduation exams in the Republic of Croatia. After graduating from high school, and based on their success in the state graduation exams, students enroll in higher education. In addition to the state graduation exams, some study programs also organize additional tests of knowledge and skills.

The state graduation exam in the Republic of Croatia is conducted by the National Center for External Evaluation of Education in cooperation with secondary schools and examination coordinators and other institutions involved in the implementation of the state graduation exam. The state graduation exam is conducted in the summer and autumn exams period. The Ordinance on taking the state graduation exam prescribes the content, conditions, manner and procedure of taking the state graduation exam, and all students for the state graduation exam are obliged to adhere to the ordinance.

The state graduation exams are exams in general education subjects and consist of two parts: obligatory exams and elective exams. The obligatory part of exams is from general education subjects: Croatian language, Mathematics and foreign language. Obligatory exams can be taken at one of two levels: higher (A) or basic (B). The higher (A) level of the exam is aligned with the curriculum for general-education schools, and the basic (B) level of the exam is aligned with the curriculum with the lowest hourly rate in four-year vocational schools. In the elective part of the state graduation exam, students choose the subjects they will take, with a maximum of six elective subjects in one exam period.

3. ANALYSIS OF THE SUCCESS OF SECONDARY EDUCATION DURING THE COVID-19 PANDEMIC

Changes in the education system have also been analyzed by the scientific community. For example, Sintema (2020) analyzed the situation in Zambia, Bao (2020) analyzed the University of Beijing, Toquero (2020) for the Philippines, and Tarkar (2020) for India. The impact of the COVID-19 pandemic on higher education in the world has been analyzed by Marinoni, van't Land and Jensen (2020) and Schleicher (2020), Onyema, Eucheria, Obafemi and others (2020). An analysis of recent scientific literature has shown that a relatively small number of studies have analyzed the impact of the COVID-19 pandemic on the education system, and especially a small number have analyzed the relationship between the COVID-19 pandemic and the education system in the Republic of Croatia. A common conclusion of the analyzed recent scientific literature is that COVID-19 has detrimental effects on education. The introduced measures reduced or prevented access to educational and research institutions and negatively affected job losses. Moreover, the teaching staff was forced to rely on technology to ensure continuous online learning during the coronavirus pandemic. This is where the IT competencies of teachers and students came to the fore. Also, there were problems with poor infrastructure and network capacity, unavailability of IT equipment and similar problems.

The state graduation exam can be a good indicator of the acquired knowledge of students and the success of the teaching process. Therefore, in this research, an analysis of student performance in the state graduation exam was conducted. In this paper, the results of the obligatory part of the state graduation exam in the summer exam period from the school year 2012/2013 until 2020/2021 are observed. The English language exam was viewed as a foreign language exam. The average grades on the state graduation exams were analyzed. After that, some other indicators were analyzed.

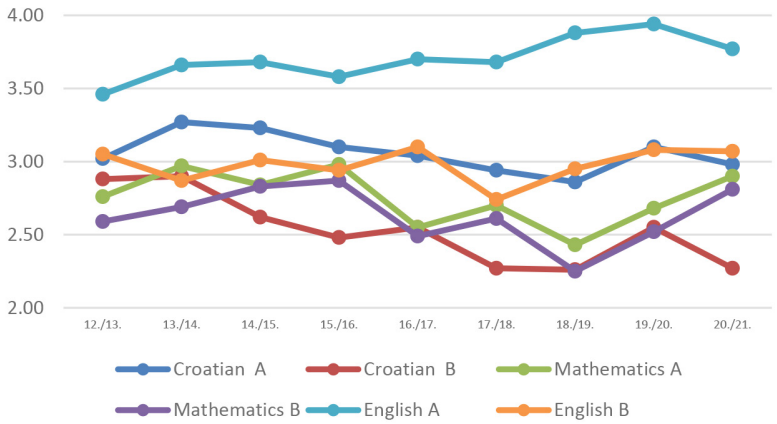

Figure 2. Average grade on the state graduation exam
Source: authors' work based on ŠeR – Školski e-Rudnik, https://mzo.gov.hr/istaknute-teme/ser-skolski-e-rudnik-3419/3419

Analyzing Figure 2, there is no particularly dramatic drop in the average grades in the obligatory part of the state graduation exam. Some grades have even increased in the two years of the pandemic (2019/2020 and 2020/2021), such as Croatian A level, English B level, Mathematics A and B level. If we look at Figures 3 and 4 where student achievement is divided into general-education schools and vocational schools, the results again do not indicate a decline in student achievement in the state graduation exam.

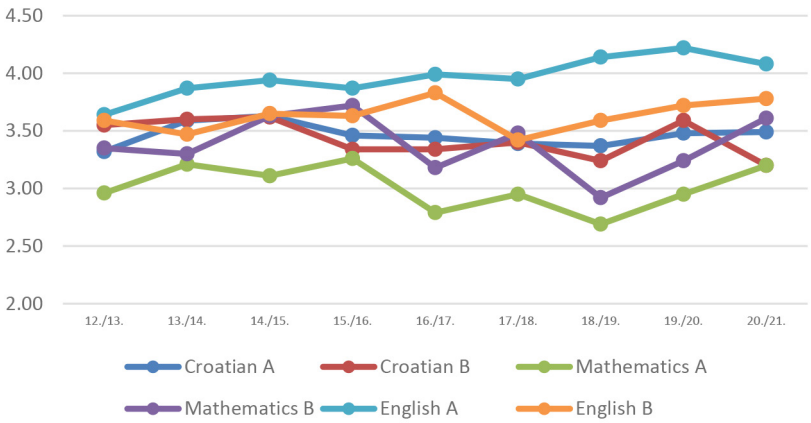

Figure 3. Average grade on the state graduation exam – general-education schools
Source: authors' work based on ŠeR– Školski e-Rudnik, https://mzo.gov.hr/istaknute-teme/ser-skolski-e-rudnik-3419/3419

Furthermore, the share of students who passed the state graduation exam with insufficient success in subjects and levels was analyzed (Figure 5). The results showed that no major decline was recorded, there is no difference in terms of levels.

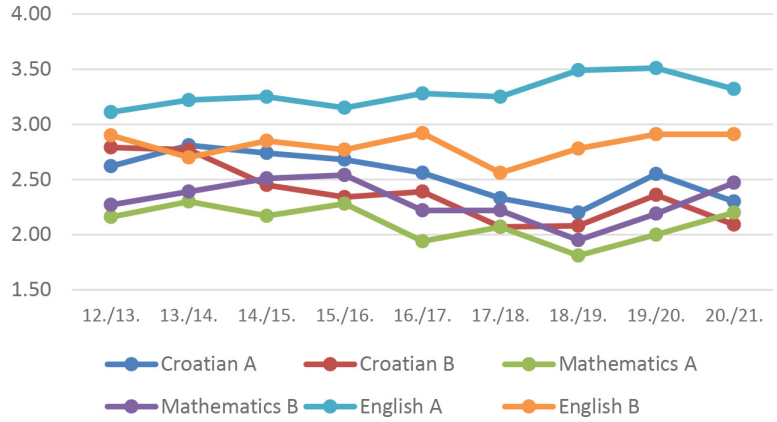

Figure 4. Average grade on the state graduation exam – vocational schools

Source: authors' work based on ŠeR – Školski e-Rudnik, https://mzo.gov.hr/istaknute-teme/ser-skolski-e-rudnik-3419/3419

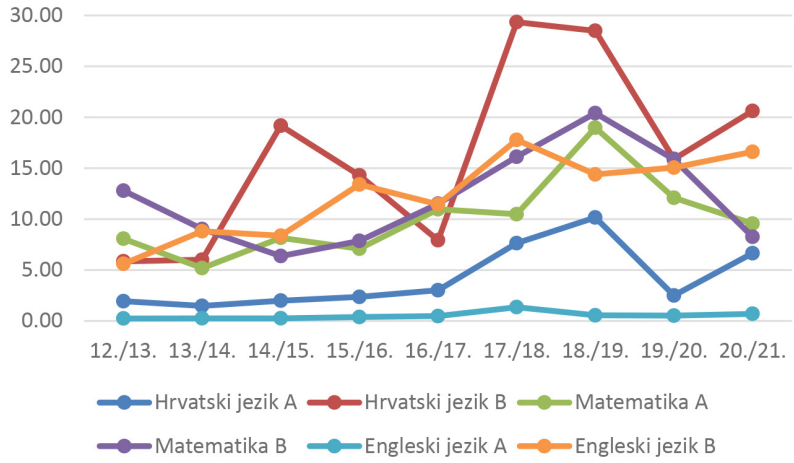

Figure 5. Shares of insufficient grades in the total number of grades - state graduation in the Republic of Croatia

Source: ŠeR – Školski e-Rudnik, https://mzo.gov.hr/istaknute-teme/ser-skolski-e-rudnik-3419/3419

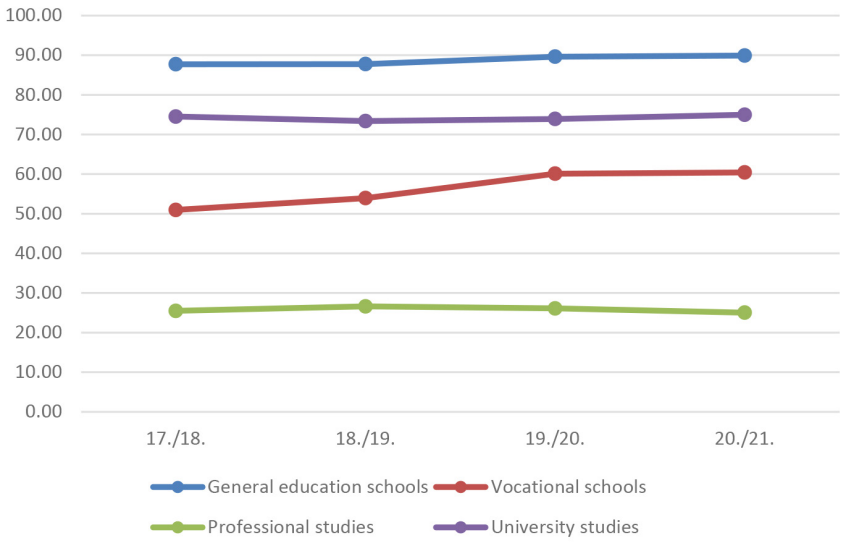

Figure 6. Shares of students enrolled in higher education institutions by type of secondary school program and by type of enrolled higher education institution

Source: ŠeR – Školski e-Rudnik, https://mzo.gov.hr/istaknute-teme/ser-skolski-e-rudnik-3419/3419

The results of the success of secondary education have an impact on higher education. The share of students who passed the state graduation exam and enrolled in some form of higher education (professional and university studies) was also analyzed.

The results showed that there is no difference in the shares of insufficient grades in the total number of graded students at the state graduation exam, neither in general-education schools nor in vocational schools before and during the COVID-19 pandemic. If we look at the share of students who enrolled in any professional or university study in the total number of students who took the state graduation exam, there is no difference in the period before and during the COVID-19 pandemic.

4. CONCLUSION

The outbreak of the COVID-19 pandemic affected all segments of education, primary, secondary and higher education. Many countries closed schools and colleges to fight the COVID-19 pandemic. Students had to adjust to the fact that they were instantly isolated from their usual school environments and get used to classes online. Teachers had to adjust their working methods, overcome information barriers and design adequate content in a very short time. In this paper, the impact of the COVID-19 pandemic on success in secondary and higher education is examined, and the success criterion is the success in the state graduation exam and the success of enrollment in some of the higher education institutions in the Republic of Croatia. The results showed that in comparison with the school and academic years before the pandemic, there was no significant drop in the average grades on the state graduation exam. Also, the success of enrollment in higher education did not decline.

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Be Free to Communicate on Social Media, but Respect the Values of Education!

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Abstract: *The technological revolution and the search for the "new post-pandemic normality" require a re-reading of the freedoms of communication (freedom of expression and freedom of information), in order to conceive, in the face of the change of the paradigm of digital actors to three elements (individual, state and company), a new system that brings together the public and the particular which can be called collective and private, capable of forming awareness for peace in the face of the guarantee of the right to non-discrimination, centered on the balance between the legal and the civic possible through the binomial instruction-respect, that is, the individual recognition of respect for human dignity as guided by human rights in the perspective of fundamental freedoms in the posting and sharing of information on social networks, as oriented by the education values.*

1. INTRODUCTION

Humankind lives in times of challenges and adaptations that are easily perceived by the increase of tensions, social and political, facilitated by the technological revolution, in particular the growth of social networks, whose information, not always true and morally acceptable, quickly reaches a huge number of people. There is a phenomenon to be studied: what limit should be imposed on freedoms of communication in the context of digital networks, in the context of free access to social networks?

In fact, the issue is broad and needs to be restricted to two criteria: the legal (the duty to be regulated by law, in which coercion contributes to determining what the individual must do in a legal perspective) and the civic (personal conduct based on individual conscience that stimulates "positive" social action). Since then, two new questions have arisen: what to protect? And, how to protect?

The object of protection must be the individual in his particularity as a human being, both in the access to quality information justified in the principle of truth and in the preservation of his dignity (v.g., honor, privacy, freedom, etc.) against the abusive use of the freedoms of communication imposed or shared against him. Among the offenses to dignity by the abusive use of the freedoms of communication, discrimination stands out and will receive more attention.

Since this is a prospective analysis and not merely a critical or descriptive one, the paper intends to reflect on two points in order to contribute to the theoretical-practical solution: (a) the

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change in the social, political and legal paradigm that modified the relationship between two actors (State and individual) to, by adding the third vertex, recognize it of interest to three actors (State, individual and companies that control the digital public sphere); and, b) integrate to the discourse the values inherent to education in the perspective of a culture of peace in a world in sustainable development for all human beings.

Considering the breadth of the argument, the second point of exploration will be restricted to the values of education aimed at instruction (theoretical foundation for true and positive knowledge) and respect among the equals (a practical foundation that induces the reproduction in the society of "positive social action" according to the humanitarian element in a democratic perspective), both justified on premises recognized by the General Assembly of United Nations within the system of culture of peace (A/RES/53/243) and the system of education for democracy (A/RES/71/8).

Deducing the analysis, as said, the conclusion intends to propose elements based on the instruction-respect binomial justified in the values of education that form the individual conscience for the use of the freedoms of communication in the digital environment in the scope of social networks in favor of non-discrimination, having in the observation of the Portuguese constitutional system experience as a practical element of ponderation.

2. POST-WARS AND A NEW LEGAL VISION ON FREEDOMS OF COMMUNICATION

In the post-war world, the natural endowment of the manifestation of reason through speech giving an opinion or expressing a position in front of the discourse has gained greater legal attention, whose international trend towards effective protection began to be introduced into a human being consciousness and induced into political-constitutional programmes by Article 19 of the United Nations Universal Declaration of Human Rights (UN/UDHR), as per A/RES/217(I-II) of 10th December, 1948.

Since then, the legal guarantee has been established for individuals to, if they wish, express their opinion as they wish, without interference or external limitation, guaranteeing in the same way, the right to receive information, which originated the normative reading of the concept of the universal right guaranteed by individual freedom against everyone, including the State.

The induction to the political-constitutional programmes germinated on the occasion of the European Convention of Human Rights (ECHR) which recognized the premises of the UN, provided in Article 10 for freedom of expression. The legal treatment was much more cautious when defining the duty and the exceptions so that the duty guaranteed the right to express opinions and information as well as to receive information and ideas without any restrictions (mainly political) or hindrance, especially from public authorities, continued; the exceptions were to define the restrictions (ECHR, Article 10, 1).

Thus, the restrictions were divided into two parts: a) recognition of the power of States to define rules for prior authorizations to broadcasting, cinematographic, or television companies (ECHR, Article 10, 1, in fine); and, b) recognition that the exercise of this universal right in the dimension of individual freedom could degenerate into excesses that affect other related and interconnected rights.

Regarding excesses, the possibility of imposing restrictions, formalities, conditions, or sanctions has been foreseen, with prior legal definition justified in the duties and responsibilities, as well as based on the democratic principle, whenever limited "in the interests of national security, territorial integrity or public safety, for the prevention of disorder or crime, for the protection of health or morals, for the protection of the reputation or rights of others, for preventing the disclosure of information received in confidence, or for maintaining the authority and impartiality of the judiciary" (ECHR, Article 10, 2).

In the context of nation-states, the transposition of international rule into domestic law was verified. Thus, the communication freedoms assumed the normative efficacy of a positive law that was approved by the principle of legality typical of a sovereign rule of law that intended to follow democratic values.

Thus, the Constitution of the Portuguese Republic of 1976 (in a framework of the 2005 Constitutional Revision) provided for freedom of expression in association with freedom of information, maintaining, in a broad sense, the provisions of the ECHR, both in the main provisions[4] and in the exceptions, with the novel recognition on the nature of the offenses committed in excess of the right immanent to freedom of expression and information, which are subject to the general principles of criminal law or to the illicit offense of mere social order with the subsequent judicialization of the act in courts or administrative bodies (CPR/1976, Article 37, 3), and ensured the rights of reply and rectification, to individuals and enterprises, in addition to any compensation proportional to the damage (CPR/1976, Article 37, 4).

In the scope of supranational law, the treatment was similar. After all, it is perceived in the Charter of Fundamental Rights of the European Union (CFREU) in its Article 11, 1, the reproduction of the general rule conceived in Article 10, 1, of the ECHR, without mentioning the exceptions. However, the following paragraph when it determines that "the freedom and pluralism of the media shall be respected", allows numerous considerations, including the one that sees the change of the paradigm on which freedom of expression was erected by the dual system, to a broader conception, with a third actor beyond the individual and the nation-state.

3. FREEDOMS OF COMMUNICATION AND TECHNOLOGICAL REVOLUTION: CHANGING THE PARADIGM TO THE TRIPLE ACTORS SYSTEM

The deductive systematization, from the UDHR (Article 19), through the ECHR (Article 10) and the CFREU (Article 11), to the CPR/1976 (Article 37), admits the recognition of the dualistic or dyadic system of protection of the freedoms of communication limited to the respect to the freedom of expression and freedom of information that relates two political-legal actors, the State and the individual (citizen or enterprise), each with rights and duties previously defined in law and clarified in principles, among them the principle of protection of citizens' trust.

Such principle of protection of citizens' trust is interpreted according to the principle of truth by which the freedoms of communication should be read in the sense of acquisition of knowledge

[4] The main provisions are observed in Article 37, 1, of the Constitution of the Portuguese Republic (CPR/1976), in which all individuals have the right to emit ("express and disseminate") their thoughts by disseminating information, opinions and ideas, by means of words, images or any means suitable for this purpose, as well as the right to information in the dual perspective of "to know" (right to seek information) and "being informed" (right to receive information spontaneously). Furthermore, these rights cannot be impeded neither illegitimately limited, especially by censorship (CPR/1976, Article 37, 2).

qualified by good information defined by truth, so that "healthy participation in civic life depends on the healthy formation of public opinion. The more enlightened the citizens of a country, the less likely they are to be the target of manipulation of their political will"[5].

At the dawn of the 21st century marked by the technological revolution, the reading of the dualistic relationship becomes more difficult. Here is the paradigm reversal point: in the domain of the information age with the accelerated technological progress that has enabled rapid access to knowledge (about facts and opinions, scientific and vulgar, academic and general), largely due to the social networks favored by the new stage of dialogue and knowledge, known as the Internet, freedoms of communication have come to be seen through a broader prism, without physical boundaries.

The change of paradigm presents a new reality, although it has favored access to information: the facilitation of issuing opinions and disseminating knowledge allows the publication of opinions that may violate the limits and restrictions on freedom of expression (v.g. fake news, hate speech, political manipulation[6], etc.), spread by information and social networks, especially the Internet. So, we realize the importance of a third political actor that needs to be legally integrated into the normativity of freedoms of communication (freedom of speech and freedom of information) and put under the watchful eye of civility understood by respect, tolerance, and good practices.

This third actor is defined by Jack Balkin as the "third group of players: a privately owned infrastructure of digital communication composed of firms that support and govern the digital public sphere that people use to communicate" (Balkin, 2018, p. 2012), stimulated the normative rereading forcing the novel regulation in the face of the third vertex of this new relational triangle that replaced the previous linear model formed by two actors.

Thus, in a broader sense, the right to be forgotten[7] is recognized, in addition to the encouragement to States to create laws that prevent the irresponsible use of cyberspace (the practice of

5 Personal and free translation of: "a participação sadia na vida cívica depende da formação saudável da opinião pública. Quanto mais esclarecidos os cidadãos de um país, menor é a probabilidade de serem alvo de manipulação da sua vontade política" (Machado, 2020, p. 223).

6 As stated by Jónatas Machado and Iolanda Brito: "With the internet and social networks, as well as with information technologies, the level of connectivity between people has increased exponentially. If, on the one hand, this circumstance has reinforced the scrutiny of public powers, which is no longer an exclusive function of the press, it is also true that, on the other hand, without the mediation of journalism, the necessary filter to ensure the reliability of news content is non-existent. The recent phenomenon of the massive use of fake news, i.e. false information published on the Internet with the intention of influencing opinion, had an impact on the result of the Brexit referendum, on the US elections that elected Donald Trump as President and even on the presidential elections that elected Jair Boslosonaro (...)"; as a personal and free translation of: "Com a *internet* e as redes sociais, assim como com as tecnologias da informação, o nível de conectividade entre as pessoas aumentou exponencialmente. Se, por um lado, esta circunstância veio reforçar o escrutínio dos poderes públicos, que deixou de ser uma função exclusiva da imprensa, também é certo que, por outro lado, sem a mediação do jornalismo, passa a inexistir o necessário filtro para garantir a fidedignidade dos conteúdos noticiosos. O recente fenómeno do recurso massivo a *fake News*, ou seja, a informação falsa publicada na *Internet* com a intenção de influenciar a opinião, teve impacto no resultado do referendo no *Brexit*, nas eleições norte-americanas que elegeram Donald Trump como Presidente e ainda nas eleições presidenciais que elegeram Jair Bolsonaro" (Machado, 2020, p. 223).

7 In European Law, we highlight as some of the main elements on the "right to be forgotten": a) in the normative scope, Regulation (EU) 2016/679 of the European Parliament and of the Council, 27 April 2016, Article 17, and Law nº. 75/2021, 18 November, from the Assembly of the Portuguese Republic; b) in the jurisprudential scope, Google Spain SL, Google Inc. vs. Agência Española de Protección de Datos (AEPD), Mario Costeja González (CJEU, Case C 131/12), and European Court of Human Rights (ECtHR), Case 77419/16 - Case: Biancardi vs. Italy.

disinformation and other offenses to individual freedoms), the guarantee against all forms of discrimination and protection against virtual-digital crimes[8], including social networks[9].

Beyond the normative adequacy, a greater tension between individuals is perceived, facilitated by the "expanded contents of the Net" (internet) restricted to spontaneity[10], ease[11], visibility[12], permanence[13] , and expansibility, as previewed by Raúl Trejo Delarbre (2015, p. 38-41), which favor digital hate speech in social networks characterized by intolerance in all its manifestations[14].

The clash between freedoms of communication and the right to privacy is immediately perceived, in addition to the right to true and reliable information, that is, the individual's power to communicate in the networked digital environment and the right to public protection that can be opposed by the individual in the face of this related right.

Moreover, it is no longer a matter of the relationship between the nation-state and the individual, since the social networks and related ones make the issue more complex, which, among countless variables, may be restricted to the careful look of non-discrimination, both of not preventing freedom of expression and information, and of preventing its misuse when it incites discrimination, especially by hate speech, in its multiple possibilities (v.g. racism, xenophobia, homophobia, bullying, etc.).

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8 With special relevance "against the apology of terrorism, incitement to hatred and violence against a person or group of persons because of their race, colour, ethnic or national origin, ancestry, religion, sex, sexual orientation, gender identity or physical or psychic disability, harassment or sexual exploitation of children, female genital mutilation and persecution"; as a personal and free translation of: ""contra a apologia do terrorismo, o incitamento ao ódio e à violência contra pessoa ou grupo de pessoas por causa da sua raça, cor, origem étnica ou nacional, ascendência, religião, sexo, orientação sexual, identidade de género ou deficiência física ou psíquica, o assédio ou exploração sexual de crianças, a mutilação genital feminina e a perseguição" (Law nº. 27/2021, 17 May, Article 4, 3).

9 By example: a Carta Portuguesa de Direitos Humanos na Era Digital, introduced by Lei n.º 27/2021, de 17 de maio; e Gesetz zur Verbesserung der Rechtsdurchsetzung in sozialen Netzwerken (Netzwerkdurchsetzungsgesetz - NetzDG).

10 In the virtual environment, the manifestation of opinion, by words or images, follows the unmeditated impulses to the detriment of common sense, conduct facilitated by the false idea of personal concealment, either by physical distance – individuals are more thoughtful in the presence of their interlocutor, at least for fear of reaction – or by dissimulation, or as Delarbre (2015, p. 38) said: "A phrase that slips fleetingly from the keyboard to the Web before we put our wisdom chip to work, a photograph that we share before thinking about whether we really want it to be seen by others... it has happened to all of us" ("Una frase que se desliza fugaz del teclado a la Red antes de que pongamos a funcionar el chip de la sensatez, una fotografía que compartimos antes de pensar si realmente queremos que sea vista por otros... a todos nos ha sucedido").

11 The free access and simplicity to post, without filters or restrictions, as well as the propensity of people to denigrate or applaud others, without reflection or argumentation, contributes to the spread of insults and other aggressions.

12 People post on social networks, or interact on the internet, with the primary purpose of being seen, of being known by others: "Expressions of aggression and hatred, even if they were intended for a specific person or group, are there to be known by others" ("Las expresiones de agresión y odio, aunque estuvieran destinadas a persona o un grupo específicos, aparecen allí para ser conocidas por otros" – Delarbre, 2015, p. 40)

13 Once the information is disclosed on the internet, however fast the repentance may be, it is not possible to return to the status quo ante, so that what allows the greatest engagement is welcome; as Delarbre (2015, p. 41) reminds us: "But scorn and offence fare better (i.e. run faster) both in the gossip that animates any group of people interacting offline and in the collection of networks and mirrors that is the internet" ("Pero escarnios y ofensas corren con mejor suerte (es decir, corren más rápido) tanto en el chismorreo que anima a cualquier grupo de personas que se relacionan fuera de línea como en esa colección de redes y espejos que es internet").

14 María Elena Ramírez (2015, p. 51-59) highlights some initiatives to combat the intolerance that leads to hate speech: Young People Combating Hate Speech Online (European Union), PantallasAmigas (Spain), and #SinTags (Mexico).

4. FREEDOMS OF COMMUNICATION AND RIGHT TO NON-DISCRIMINATION

The freedoms of communication in direct relation to the right to non-discrimination must be taken as an ideological limit to human conduct in social networks, which challenges reflection on the numerous possible consequences of free human action in the face of the duty to respect human dignity.

In this sense, Alejandra Lagunes Soto Ruiz (2015, p. 96), proposes the following question: how to understand freedom of expression (extendable to freedom of information) and the right to non-discrimination in the context of social networks? In her reflection, Ruiz proposes a dual analysis girded to the legal and civic aspects, with the moderation of speech being the Mexican reality that allows her to state: "The challenge of facing this problem is different because while discrimination by the authorities is solved with regulation and adequate implementation mechanisms, discrimination among empowered citizens with the microphone of social media needs a deeper solution"[15].

In fact, the proposed solution is limited to the formation of awareness for non-discrimination based on tolerance and respect, both induced by education that raises civic responsibility by which individuals themselves control the public space, regulating the freedoms of communication[16].

5. CULTURE OF PEACE AND AWARENESS: A BRIEF STRAIGHT TO THE POINT

The analysis of the formation of consciousness for non-discrimination that sustains positive media discourses on the values inherent to human dignity, possible before the norm and the conduct in perspective of legal and civic aspects, can be linked to the broader aspects of the culture of peace, as an international micro-system conceived in the domain of the United Nations peace system[17],

[15] Personal and free translation of: "El reto de enfrentar este problema es distinto, porque mientras la discriminación por parte de las autoridades se resuelve con regulación y mecanismos de implementación adecuados, la discriminación entre ciudadanos empoderados con el micrófono de las redes sociales necesita una solución más profunda" (Ruiz, 2015, p. 98).

[16] "Let us imagine for a moment what the development of a true civic awareness scheme in social networks could generate: a mechanism in which all users ensure a free-discrimination environment, where in a decentralised way the conditions of freedom and equality of all people are monitored. "; as a personal and free translation of: "Imaginemos por un momento lo que el desarrollo de un verdadero esquema de conciencia cívica en las redes sociales podría generar: un mecanismo en el que todos los usuarios aseguren un entorno libre de discriminación, donde de manera descentralizada se vigilen las condiciones de libertad e igualdad de todas las personas" (Ruiz, 2015, p. 99).

[17] There is a direct reference to the proposal of systematization of "peace", as a foundation and constitutive principle of the UN, divided into four phases unveiled in the reading of the United Nations periods of sessions, between 1945 and 2018, as said elsewhere, "we propose a four-step analysis of the United Nations peace system conceived: a one, by the laying of the foundations for the conception of the system with temporal restriction in the first five periods of sessions, especially between the third and the fifth (A/RES/3/190; A/RES/3/217; A/RES/4/290; A/RES/5/377; A/RES/5/380; A/RES/5/381; and, A/RES/5/494); two, for establishing a culture of peace (A/RES/53/243; A/RES/33/73; and A/ RES/39/11); three, for declaring the right to peace (A/RES/71/189); and four, for promoting peace as a vital requirement for the full enjoyment of human rights for all (A/RES/33/170)"; as a personal and free translation of: "propõe-se a análise, em quatro passos, do sistema de paz das Nações Unidas concebido: a um, pelo assentamento das bases para a concepção do sistema com restrição temporal nos cinco primeiros períodos de sessões, mormente entre o terceiro e o quinto (A/RES/3/190; A/RES/3/217; A/RES/4/290; A/RES/5/377; A/RES/5/380; A/RES/5/381; e, A/RES/5/494); a dois, pela instauração da cultura de paz (A/RES/53/243; A/RES/33/73; e, A/ RES/39/11); a três, pela declaração sobre o direito à paz (A/RES/71/189); e, a quatro, pela promoção da paz como requisito vital para o pleno desfrute dos direitos humanos para todos (A/RES/33/170)" (Pires, 2019, p. 88).

considering that the foundations are the same: the values inherent to human dignity and the duty of all, including the States, to respect and protect them, in the narrow limit of the UDHR.

Specifically within the scope of the Declaration on a Culture of Peace welcomed in A/RES/53/243[18], inspired and made possible by the optimistic feeling of the end of the Cold War (?!), three assertions are recognized: the first, wars are born in the minds of human beings, so that it is there that peace must be strengthened (a premise previously stated in the Constitution of the United Nations Educational, Scientific and Cultural Organization); the second, the perception that peace, more than the simple absence of conflict, requires a positive, dynamic and participatory process of promoting dialogue in order to seek a negotiated solution in a spirit of understanding and cooperation of all actors; and, the third, the concrete need to seek the elimination of all forms of discrimination and intolerance[19].

To justify the assertions, the Declaration assumes that the successful implementation of the culture of peace is only possible through the dissemination of values, attitudes, behaviors and lifestyles dedicated exclusively to the promotion of peace among individuals, groups and nations (art. 2). So, the education, on all levels and aimed at the dissemination of human rights, is the fundamental means for its edification (art. 4), while everyone must be committed to its strengthening, that is, governments have the primary function of promoting it (art. 5), civil society is committed to its full development (art. 6), the mass media must contribute to its strengthening (art. 7), development (art. 8), and dissemination of qualified and educational information (art. 7), as well as the United Nations must continue with its mission to play the critical role leading to the strengthening of the movement (art. 9), and parents, teachers, politicians, journalists, religious bodies and groups, intellectuals, all those who carry out scientific, philosophical, creative and artistic activities, health professionals, humanitarians, directors of governmental and non-governmental organizations, to whom the key role of promoting the culture of peace belongs (art. 8)[20].

Furthermore, the culture of peace, as a set of values, attitudes, traditions, behaviors and lifestyles is based on[21]:

a) respect for life, the end of violence and the promotion of non-violence through education, dialogue and cooperation (Article 1, a);
b) respect for the principles of sovereignty, territorial integrity, political independence of States, and non-interference in matters that are eminently within the internal jurisdiction of States (Article 1, b);

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18 https://documents-dds-ny.un.org/doc/UNDOC/GEN/N99/774/43/PDF/N9977443.pdf?OpenElement, last access: 03.03.2022.

19 The reflection is part of the rationale discussed in the paper entitled: "From the inversion of the theoretical-practical paradigm to the current conception of peace as a vital requirement for the full enjoyment of human rights in equality", with the original title: "Da inversão do paradigma teórico-prático até a atual concepção da paz como requisito vital para o pleno desfrute dos direitos humanos em igualdade" (Pires, 2019, p. 78-98).

20 The reflection is part of the rationale discussed in the paper entitled: "From the inversion of the theoretical-practical paradigm to the current conception of peace as a vital requirement for the full enjoyment of human rights in equality", with the original title: "Da inversão do paradigma teórico-prático até a atual concepção da paz como requisito vital para o pleno desfrute dos direitos humanos em igualdade" (Pires, 2019, p. 78-98).

21 The reflection is part of the rationale discussed in the paper entitled: "From the inversion of the theoretical-practical paradigm to the current conception of peace as a vital requirement for the full enjoyment of human rights in equality", with the original title: "Da inversão do paradigma teórico-prático até a atual concepção da paz como requisito vital para o pleno desfrute dos direitos humanos em igualdade" (Pires, 2019, p. 78-98).

c) Unrestricted respect for human rights and fundamental freedoms, and their dissemination (Article 1, c);
d) a commitment to the peaceful resolution of conflicts (Article 1, d);
e) in the effort to satisfy the needs of development and protection of the environment (Article 1, e);
f) respect for and promotion of the right to development (Article 1, f)
g) respect for and promotion of equal rights and opportunities, especially for women and men (Article 1, g);
h) respect for the right of all people to freedom of expression, opinion, and information and its promotion (Article 1, h); and
i) adherence to the principles of liberty, justice, democracy, tolerance, solidarity, cooperation, pluralism, cultural diversity, dialogue, and understanding at all levels of society and among nations (Article 1, i).

It is perceived, therefore, that the civic use guided by the legal aspect of the freedoms of communication is a theme belonging to the normative system of culture of peace, therefore restricted to the elements of A/RES/53/243. Thus, converging the assertions on the culture of peace in which the conscience for peace, externalized by dialogue inspired by cooperation and understanding leads to the repeated social practice of combating discrimination (guarantee non-discrimination), beyond the regulation enforceable to all (individuals, State, and companies that control the digital public sphere), with the precious help of education, is directly applicable to the guarantee and protection of freedoms of communication.

6. EDUCATION AS AN INSTRUMENT OF THE CULTURE OF PEACE WITHIN THE FRAMEWORK OF FREEDOM OF COMMUNICATION

Education as an instrument for strengthening the culture of peace in the face of the challenge of forming awareness for peace leads to numerous paths of analysis, the most common being the link with the right to peace (A/RES/71/189, Article 4) and democracy (A/RES/71/8, Article 2), when discussing the transposition of values from the individual to society, as seen in reflections on legal and civic criteria, even with restrictions on freedoms of communication.

In summary, the Declaration on the Right to Peace (A/RES/71/189), recognizes as ideological bases, among others[22], the Charter of the United Nations, the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights, the International Covenant on Economic, Social and Cultural Rights, the Declaration on the Right to Development, the Vienna Declaration and Programme of Action, the Preparation of Societies for Living in Peace, the Declaration on the Right of Peoples to Peace, and the Declaration and Programme of Action on a Culture of Peace, regulated the theme in five articles[23].

[22] For example, the United Nations Millennium Declaration (A/RES/55/2), the 2030 Agenda for Sustainable Development (A/ RES/70/1), the 2005 World Summit Outcome Document (A/RES/60/1), the Declaration on the Principles of International Law, particularly those relating to friendly relations and cooperation among States (A/ RES/25/2625), the Definition of Aggression (A/RES/29/3314), and the Declaration on the Granting of Independence to Colonial Countries and Peoples (A/RES/25/1514).

[23] The reflection is part of the rationale discussed in the paper entitled: " Forced migratory flows and culture of peace: a hypothetical contribution based on education as a pillar of democracy and alternative solution to the crisis of the welfare state", with the original title: "Fluxos migratórios forçados e cultura de paz: um contributo hipotético baseado na educação como pilar da democracia e na solução alternativa à crise do estado assistencialista" (Pires, 2018, p. 67-87).

Beyond the concept that all (States and human beings) have the immanent right to live in peace, regardless of particularities (A/RES/33/73, Article 1), and that this right is sacred (A/RES/39/11, Article 1), the interpretation has been extended to also include the enjoyment of peace, in the sense of the promotion and protection of all human rights and the achievement of full development for all (A/RES/71/189, Article 1).

This provision would be possible with the respect, application and promotion of equality and non-discrimination, justice and the rule of law, and guarantees against fear and destitution, without prejudice to the other rights referred to in the United Nations Charter, the Universal Declaration of Human Rights and of international and regional instruments on the subject (A/RES/71/189, Article 5), raised to the condition of duties enforceable against States (A/RES/71/189, Article 2), extendable to the United Nations and the specialized agencies/bodies within the limits of their competencies, responsibilities and actions (A/RES/71/189, Article. 3).

States, the United Nations and specialized agencies/bodies must adopt sustainable measures appropriate to the fulfillment of their task, and the support and assistance of international, regional, national and local organizations and civil society are requested (A/RES/71/189, Article 3) to fulfill their duty to ensure the enjoyment of peace within a human rights framework and in pursuit of full development. In all cases, appropriate education, inspired by the values of tolerance, dialogue, cooperation and solidarity among all human beings, must serve as a basic instrument for building and strengthening the right to peace (A/RES/71/189, Article 4).

Furthermore, education within the framework of democratic values as recognized in the Resolution on Education for Democracy (A/RES/71/8) has elevated education to the status of a tool to foster constructive and inclusive political participation in relation to human development, in the same way as it has contributed to the strengthening of democracy, good governance and the rule of law at all levels[24].

In this sense, education has gone beyond the condition of the universal right to be provided to all, especially in the context of public policies (UNUDHR, Article 26), to constitute a pillar of democracy understood as "the universal value based on the free expression of the will of people to determine their own political, economic, social and cultural systems and their full participation in all aspects of their lives, economic, social and cultural systems, and their full participation in all aspects of their lives," with the proviso that "although democracies share common features, there is no single model of democracy and democracy does not belong to any country or region" (A/RES/71/8). Furthermore, it was recognized that education contributes to:

a) strengthening democracy, good governance and the rule of law at all levels;
b) the reduction of economic inequality;
c) the realization of human rights, gender equality and the empowerment of women and girls;
d) the achievement of all internationally agreed development goals, including the Sustainable Development Goals, the development of human potential, the eradication of poverty and the fostering of greater understanding between peoples.

[24] The reflection is part of the rationale discussed in the paper entitled: "Forced migratory flows and culture of peace: a hypothetical contribution based on education as a pillar of democracy and alternative solution to the crisis of the welfare state", with the original title: "Fluxos migratórios forçados e cultura de paz: um contributo hipotético baseado na educação como pilar da democracia e na solução alternativa à crise do estado assistencialista" (Pires, 2018, p. 67-87).

This led to the adoption of a series of recommendations with emphasis on encouraging the Member States and national, regional and local educational authorities to engage in the adoption of public policies to strengthen "education for democracy", through the dissemination of education in accountability for public affairs, human rights education and education for sustainable development, in their educational systems, based on the promotion and consolidation of values and democratic governance and human rights, taking into consideration innovative approaches in order to facilitate the empowerment of citizens and encourage their participation in political life at all levels (A/RES/71/8, Article. 6); a responsibility that should be shared by all.

Once the inductive normative foundation of the legal aspect is delimited, it becomes possible to recognize the meaning of education in theoretical and practical dimensions. The theoretical dimension induces the search for true and positive knowledge about social acting by which the individual should seek to educate himself according to elements justified in human rights and fundamental freedoms, whose foundation is given in guarantee of human dignity in the broadest perspective; and the practical dimension to guide the social action itself, the practice of conduct according to the knowledge acquired in accordance with human rights and fundamental freedoms in perspective of human dignity.

Such a sense of education applied to the right to non-discrimination delimited to the freedoms of communication indicates a double effective system: the collective one (formation of a collective conscience focused on human values in perspective of fundamental freedoms) and the private one (induction of human conduct that halts and ends the wrong behaviors, those that offend human dignity, especially the discriminatory ones, strengthened by the perception of the principle of respect among equals).

The expected results, from the theoretical and practical dimensions to the creation of the collective and private systems, intend to confirm, in the face of acting as the culture of peace guides, the efficiency of the binomial instruction-respect, through the verification that the search for good information converges not to post bad information; in the same way, teaching good information presupposes not sharing bad information.

7. CONCLUSION

In final words, the transposition of normative values to human conduct in society (passage from legal to civic) requires the participation of all actors who occupy the three vertices in the digital media relationship (social media and Internet), although the commitment of the one who issues the opinion and/or provides information (author of the post), as well as the one who replicates the opinion/information (author of the share) is more relevant.

Such dynamics of individual commitment and social responsibility based on respect and tolerance guaranteeing the conscience for peace applied to non-discrimination should be the foundation for conscious social engagement in the face of the new conception of freedom of expression within the triadic digital media relationship that has come to govern the freedoms of communication.

The transposition of this foundation to the collective and private systems is intended to confirm, in the context of conduct oriented by the culture of peace, the efficiency of the binomial instruction-respect, through the observation that the seek for good information converges with not posting bad information; in the same way, teaching good information presupposes not sharing bad information.

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Tourism and COVID-19: Case of the Balkan Region*

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Abstract: *The crisis caused by the Covid-19 virus has had a significant impact on the tourism industry and brought numerous changes in travel patterns. Uncertainty, travel risks, restrictions, strict measures and limitations in terms of physical contact and mobility affected a re-evaluation of the existing travel plans. The paper investigates travel plans among travelers in three Balkan countries (Serbia, Bosnia and Herzegovina, and Montenegro). Understanding tourists' preferences and future intentions are the essential basis for creating a tourist offer, keeping tourists at the national and regional level, and mitigating the harmful effects of the crisis. These could contribute to the faster regional recovery of the tourism industry on the one hand and higher levels of tourist satisfaction on the other.*

1. INTRODUCTION

Since monitoring tourist movements up to the crisis caused by the Covid-19 virus, tourism has recorded constant growth. Several crises - the financial crisis, health crises (SARS, MERS, Ebola), and terrorism - have impacted reducing the number of international tourist arrivals, most often in the regional context. After the crisis, experience has shown that a complete recovery of tourism and a renewed growth of tourist movements took place very quickly.

The crisis caused by COVID-19 is significantly different from most of the previous ones. Its global impact, affecting all countries and continents, has affected the reshaping of collective consciousness and changes in typical patterns of social behavior, tourist behavior, mobility, consumption patterns and leisure (Molloy et al. 2021; Miao et al.2021).

To better understand the effects of the crisis and investigate the consequences of the pandemic on future trends in tourism, it is necessary to perform a comprehensive analysis of tourists' intentions, choices, and behavior. It is crucial to examine general habits and tourist flows in pre-crisis and post-crisis times. The paper aims to provide insight into the characteristics of the tourist market in the three analyzed Balkan countries: Serbia, Bosnia and Herzegovina and Montenegro, and gain insight into the respondents' travel plans and intentions after and during the crisis.

The obtained results can serve as a basis for creating a tourist offer at the national and regional level, to retain tourists and faster regional recovery of the tourism industry on the one hand, but also a higher level of tourist satisfaction on the other hand.

* The paper is presented as an invited plenary lecture.

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2. TOURISM AND COVID-19

For the 10th consecutive year, international tourism arrivals grew in 2019, reaching 1.5 billion, while exports generated by international tourism reached USD 1.7 trillion. UNWTO reported that the sub-region of Southern and Mediterranean Europe also recorded a 5% growth in tourist arrivals in 2019. For the Republic of Serbia, the increase was 7.4%, Montenegro 21.4%, Croatia 4.2% and Bosnia and Herzegovina 13.7% (UNWTO, 2020).

The proclamation of the Covid-19 pandemic and the introduction of stringent travel and mobility restrictions all over the world effectively halted international travel. The tourism and hospitality industry was among the hardest-hit sectors, with a 74% drop in tourist arrivals and a loss of 1.3 trillion US$. In 2021 international tourist arrivals increased by 4% compared to 2020, but are still 72% below 2019 levels (UNWTO, 2022). Figure 1 compares data according to international tourist arrivals in 2021 with 2020 and 2019 by the world and regions.

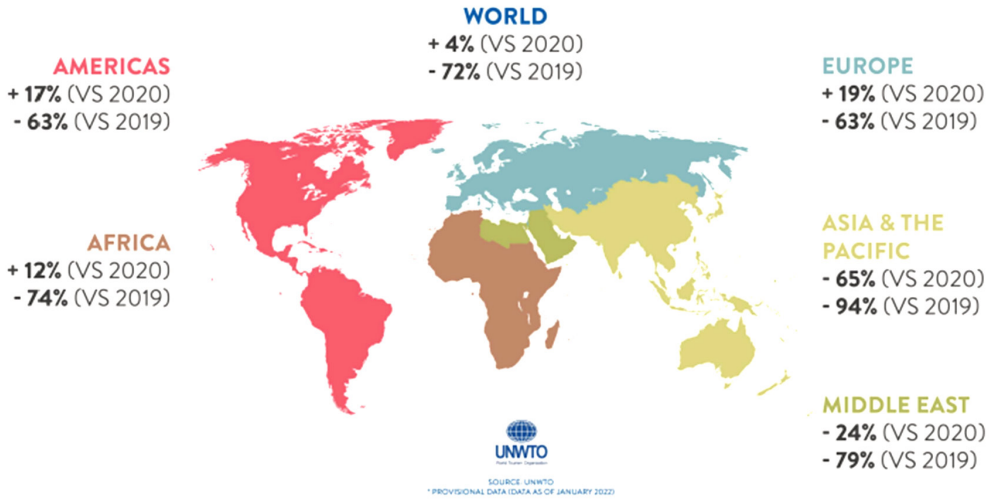

Figure. 1. International tourist arrivals by regions in 2021.
Source: UNWTO World Tourism Barometer, 2022.

The harmful effects of the pandemic have been mitigated by the actions of the governments of many countries in the world. The tourism industry benefits from general economic stimulus and support measures, but also tourism-specific measures to eliminate the adverse effects of the crisis on tourism.

The reports of the World Travel and Tourism Council (2022) for the analyzed countries indicate the following data:

- In 2019, tourism's direct contribution to Serbia's GDP was 5.9%, and it dropped 54% in 2020, having a decline of 57.5% in terms of international spending and 50.3% in domestic spending. For tourists from Serbia, Montenegro was one of the five destinations with the largest number of outbound departures in 2019 and 2020. The key source markets in 2020 for international arrivals were Bosnia and Herzegovina, followed by Montenegro.
- Tourism in Montenegro contributed 30.9% to the GDP in 2019 and declined by 75% in 2020 (81.6% in foreign consumption and 42.7% in domestic consumption). In 2019 and 2020, Serbia and Bosnia and Herzegovina were the countries with the highest number of tourist arrivals in Montenegro. In 2019 and 2020, Serbia was one of the three most important destinations for travelers from Montenegro.

- The total contribution of tourism to Bosnia and Herzegovina's GDP in 2019 was 9.8%. The decline in 2020 in GDP was 66.1%, while international visitor spending declined by 76.1% and domestic visitor spending fell by 55%. Serbia was among the top three countries from which the largest number of tourists comes and the top five destinations for Outbound Departures in 2020.

Although the data on tourist arrivals obtained from the official statistical offices for all three observed countries indicate a huge decline in foreign tourist arrivals (Serbia -75.9%, BiH-86.7%, Montenegro, -86%), domestic tourism showed better results (Serbia -25.5%, BiH-30.8%, Montenegro -31.2%).

Uncertainty, travel risks and restrictions, and strict measures and limitations in terms of physical contact and mobility caused new trends in travel behavior.

UNWTO and available literature, indicate trends that could be summarized:

- Closer destinations - Travel to closer destinations in the form of shorter stays or excursions has become more popular. People also opt for staycations - vacations at home, i.e. spending vacation time in the place of permanent residence. The crisis has only intensified the desire to travel, and the uncertainty and complexity of travel organization have affected the planning of several short weekend trips within the homeland. Such journeys provide a higher level of safety and less risk (Ioannides & Gyimóthy, 2020).
- Outdoor adventure – Tourists are more interested in outdoor activities, walking tours, cyclotourism (de Haas et al., 2020), ecotourism, green and other environmentally oriented forms of tourism. Protected natural areas, such as national parks, rural areas and exciting landscapes are becoming attractive destinations. According to Mackenzie and Goodnow (2020), micro-adventures in the local area will become more interesting.
- Travel flexibility - One of the main concerns of tourists is the flexibility in travel organization and cancellation and refund policy in case of inability to travel. With the constant changes in entry and exit requirements, Covid certificates, and other issues, the possibility of last-minute booking is becoming increasingly important (Uğur & Akbıyık, 2020).
- Safety and Hygiene - Safety and cleanness are the key issues in vacation planning (Del Chiappa et al., 2021) and the accommodation booking process. Hygiene and sanitation measures and their adequate promotion are how the accommodation industry adapts to new circumstances (Roelofsen & Minca, 2021).
- Longer stay - More flexible work policy and remote work introduced a new trend - workation, which combines work and vacation and allows people to have a vacation without taking a break from work. Hotel chains (Marriott, Hilton and Hyatt) offered unique programs to respond to this trend (e.g., WorkSpaces by Hilton). On the other hand, due to the popularity of private accommodation, where overnight stays are usually cheaper than in hotels, and the risk that frequent change of destination bears, guests prefer to stay longer in one place/object.
- Traveling with family and friends - Tourists would rather travel with family and friends than in groups with strangers. Instead of group trips, tour operators will turn to personalized tailored-made tours that include smaller groups of people who know each other.
- Demographic change - Travel recovery is more robust among the younger segments, while the tourists of the third age are the most affected. Research has shown that older people will have lower travel needs, especially if they have health problems (Peluso & Pichierri, 2021)
- Solo travel - The market of individual travelers continuously grows despite the limitations, where Wen et al. (2020) state that the pandemic affects the expansion of independent travel, where luxury, health, wellness, and slow and smart tourism take precedence.

- Responsible travel - Travelers pay more attention to sustainability, authenticity, positive impact and respect for the locals. Stankov et al. (2020) point out that the experiences during the pandemic will create a new category of tourists - mindful tourists (Tauber & Bausch, 2022).

The tourism sector beats with uncertainty for two years. The recovery remains slow (growth of 4% in 2021 compared with 2020) (UNWTO, 2022) and uneven across world regions due to varying mobility restrictions, vaccination rates, and traveler confidence. Also, the highly contagious Omicron variant disrupted the recovery and made traveling more complicated for organization and realization.

3. METHODOLOGY

A total of 787 respondents from three countries participated in the survey: Serbia (42.7), Bosnia and Herzegovina (20.9%) and Montenegro (7.3%).

The questionnaire consisted of two parts. The first part of the questionnaire included questions related to the socio-demographic characteristics of the respondents and questions related to the most common motives for traveling and travel companions. The second part of the questionnaire consisted of questions related to planned trips during/after the crisis, travel period, length of stay, choice of destination, travel duration and travel organization.

The questionnaire was distributed in April 2020 at the beginning of the Covid-19 pandemic and during the lockdown, i.e. an entire global movement restriction period. The questionnaire was distributed online, and the participation in the research was conceived voluntarily.

The sample consisted of 67.5% women and 32.5% men. The average age of respondents was 32. The highest percentage of respondents had a university degree (46.6%), while the rest had completed high school (30.7%) or master's studies (22.6%). Most of the respondents are employed (66.3%), followed by students (21.6%) and unemployed respondents (12.1%). Regarding respondents' incomes, the largest percentage of respondents said they have an average income (compared to the residence country's standard) (40.4%), and 30.1% of respondents stated that they have incomes below the average. In comparison, 20.7% of respondents do not have incomes and 8.8% think they have below-average incomes.

Regarding travel frequency, the respondents stated that in the period of one year before the pandemic, they traveled on average four times within their country and four times abroad. The dominant motive for travel for 75.7% of respondents is relaxation, rest and fun, followed by visits to friends and relatives (17.9%) and work (6.4%). The largest number of respondents (39.3%) stated that they travel most often with family, followed by 30.5% with a partner, 23.1% with friends, while the least number of respondents travel alone (5.3%) or organized in a group 1.4%.

4. RESEARCH RESULTS

The results of the field research provided insight into the travel plans of respondents from three Balkan, ex-Yugoslav countries. The largest percentage of respondents plan to travel from 1 to 6 months after the crisis ends (46.8%), which indicates their willingness to opt for tourist travel in a relatively short time. The intensive desire to travel is present among respondents from all three countries, especially Montenegro.

Table 1. Respondents' answers regarding the time of travel

Country	After the crisis and travel restrictions caused by the Covid-19 pandemic, I plan to travel:				
	Immediately after the end of the crisis	From 1 to 6 months after the end of the crisis	From 7 months to 12 months the end of the crisis	I don't plan to travel	I don't know
Serbia	14.8%	51.3%	8.4%	6.3%	19.2%
B&H	19.0%	41.4%	9.5%	6.5%	23.7%
Montenegro	32.1%	35.8%	8.6%	4.9%	18.5%
Total	17.8%	**46.8%**	8.8%	6.2%	20.5%

Source: Own research

Despite the limiting circumstances, the majority of respondents intend to travel abroad for the first time after the restrictions (46.6%). Observing the data by country, it can be noticed that the respondents from Montenegro have a greater intention to travel abroad compared to the respondents from Serbia and Bosnia and Herzegovina.

Table 2. Respondents' answers regarding the choice of domestic or foreign destination

Country	I plan for my first travel after the crisis ends to be:		
	In homeland	Abroad	I don't know
Serbia	34.6%	44.5%	20.9%
B&H	32.8%	45.7%	21.6%
Montenegro	23.5%	61.7%	14.8%
Total	32.9%	**46.6%**	20.5%

Source: Own research

It is a fact that a large number of respondents plan to realize their travels abroad in the period immediately after the stabilization of the epidemic and direct them primarily to coastal and mountain destinations. This indicates the general perception of these destinations as "healthy" and "less risky", but also the general habits of respondents to spend their holidays in these destinations.

Table 3. Respondents' answers regarding the choice of destination

Country	My choice of destination for my first travel after the crisis ends:					
	Seaside	Mountain	Spa	City	Country	I don't know
Serbia	35.0%	21.7%	4.6%	12.9%	6.1%	19.6%
B&H	31.9%	17.2%	0.9%	28.0%	3.0%	19.0%
Montenegro	39.5%	13.6%	0%	17.3%	13.6%	16.0%
Total	**34.6%**	19.6%	3.0%	17.8%	6.0%	19.1%

Source: Own research

Table 4. Respondents' answers regarding the duration of the trip

Country	I plan my first trip after the crisis to last for:				
	Less than a day	1-2 nights	3-4 nights	5-6 nights	7 nights or more
Serbia	6.8%	12.0%	18.4%	16.5%	46.4%
B&H	11.2%	20.3%	25.4%	16.8%	26.3%
Montenegro	6.2%	7.4%	22.2%	18.5%	45.7%
Total	8.0%	14.0%	20.8%	16.8%	**40.4%**

Source: Own research

When it comes to the duration of the trip, the largest percentage of respondents stated that they plan to take a vacation of 7 or more days. There is also a large share of those who plan the

realization of shorter trips immediately after the crisis, lasting 3-4 nights (20.8%). Such trips will most likely take place in the immediate vicinity and national frameworks, after which they will gradually expand to regional and possibly further destinations.

Table 5. Respondents' answers regarding the organization of the trip

Country	I plan for my first trip after the crisis to be organized:	
	Independently	By travel agency
Serbia	83.8%	16.2%
B&H	90.5%	9.5%
Montenegro	91.4%	8.6%
Total	**86.5%**	13.5%

Source: Own research

When it comes to travel organization, the largest percentage of respondents in all three analyzed countries want to organize their first trip after/during the crisis independently (86.5%).

5. CONCLUSION

The Covid-19 pandemic has left behind two extremely difficult years for tourism. According to the UNWTO, most experts do not expect the recovery of international tourism to the pre-Covid level before 2024. Travel restrictions, slow virus control and economic difficulties are the main obstacles to the recovery of international tourism. A key aspect of future travel is to create a unified and coordinated approach to travel and to fully harmonize rules and regulations, to avoid all the inconsistencies and challenges that have accompanied international travel. Experience with the pandemic will permanently affect values and change aspects of people's lives, which will result in changes in tourism behavior and patterns tourism. Despite the numerous negative aspects that the pandemic will bring, changes in tourist behavior are inevitable. One of the key changes that stand out may result in a shift towards more spatially, environmentally and socially responsible behavior. (Telišman-Košuta, 2020) and sustainable tourism. Although the pandemic has affected changes in tourism behavior and the re-evaluation of existing travel plans, the results indicate that respondents from three Balkan countries have a clear desire to travel independently, primarily abroad, primarily to coastal and mountain destinations for seven days or more. The further development of tourism in Europe and Balkan countries will depend on the ability of the governments to limit the new epidemics, harmonize the rules regarding Covid-19 and create adequate and safe conditions for tourist travel. Although domestic tourism in 2020 showed greater resilience to the crisis, Hall et al. state that the focus on domestic tourism will disappear as soon as travel restrictions are lifted. Therefore, in addition to domestic tourism, countries in the region should consider options for attracting as many tourists from the surrounding countries as possible to speed up the recovery of the tourism economy. They should base their offer on creating a safe environment, greater flexibility in booking accommodation, better outdoor activities, offering tourists a highly individualized service and a pleasant stay, an authentic and unforgettable experience.

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Brand Management of Urban Tourist Destination Based on Dimensions of Tourist Attractiveness

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Abstract: *At the very core of an urban tourist destination is a multidimensional construct of tourist attractiveness, which should be appealing to potential tourists and influence their decision to visit. Given the challenges of increasing global competition and the negative consequences of the COVID-19 pandemic, urban destinations must adequately identify the key dimensions of their attractiveness and ensure their visibility and differentiation. The purpose of this paper is to identify the role that different dimensions of tourist attractiveness have in managing the brand of an urban tourist destination, with a special focus on forming the expectations, attitudes and intentions of potential tourists. The methodology used in the paper includes: theoretical conceptualization of urban tourist destination, definition of dimensions of tourist attractiveness and determining the role that dimensions of tourist attractiveness have in managing the brand of urban tourist destinations. One of the conclusions of the research presented in the paper is that the dimensions of tourist attractiveness, both physical and social, play a key role in the strategic processes of brand management of an urban tourist destination.*

1. INTRODUCTION

The global tourism market of today is characterized by strong competition, resulting in the need to manage the brand of urban tourist destinations as a strategic activity that has a strong potential to achieve the emotional connection between tourists and destinations that would consequently influence the decision to visit. There is a large number of different and spatially concentrated dimensions of tourist attractiveness in the cities, such as: architecture, cultural heritage, historical city centers, monuments, museums, galleries, religious buildings, accommodation, restaurants, night clubs, casinos, festivals and events, friendly and hospitable local population, interesting ambience and atmosphere, security, as well as many others. It is these dimensions of tourist attractions that have the "power" to attract tourists from all over the world, offering them numerous opportunities to gain different experiences and consequently meet their needs embodied in travel motives.

The subject of the research presented in this paper are: urban tourist destinations and their characteristics; brand management of urban tourist destinations with special emphasis on models for measuring the brand of the city and urban tourist destinations; dimensions of tourist attractiveness of importance for the strategic brand management process of an urban tourist destination. The methodology used in the paper is based on secondary qualitative research. The structure of the paper includes several sections, each of which is dedicated to a specific topic that the research covers. After the introduction, the first part of the research presents the conceptualization of urban tourist destination; the second part examines the role and importance of brand management for urban tourist destinations; while the third part presents the most important

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models for measuring city brand and urban tourist destination. The fourth part analyzes the role of the dimensions of tourist attractiveness in the brand management of an urban tourist destination. The last part of the paper is dedicated to recommendations for future research and concluding remarks.

2. CONCEPT OF URBAN TOURIST DESTINATION

Urban tourist destinations, which include cities as a spatial area with a high concentration of dimensions of tourist attractions and where, consequently, many tourist activities take place, are becoming one of the most important forms of tourist destinations, both in terms of the number of tourists visiting them and their consumption at the destination. Also, urban tourist destinations are becoming more and more the primary motive for travel and not a casual visit on a trip to "summer" and "winter" destinations or a day trip during their stay. A typical form of urban tourism is the city break, which is defined as "a short tourist trip to one city, without an overnight stay in another destination" (Lebrun, 2014: 195) which is based on the search for experiences regarding the dimensions of tourist attractiveness of an urban tourist destination.

Taking into account different criteria, urban tourist destinations can differ on the one hand, while on the other hand they can have numerous common characteristics, based on which Smith et al. (2010) present a typology of urban tourism destinations: global or world cities (cities that, thanks to the impact of globalization on the economy, culture and politics, dominate the international environment, such as London or New York); national capitals (capitals of states); cultural capitals (cities with rich cultural heritage and a large selection of museums, galleries, operas, concert halls); cities with monumental heritage (cities with cultural heritage that have a very visited historical core, such as Venice); art cities (cities with a high concentration of museums, galleries and other art facilities, such as Florence or Madrid); industrial cities (individual industrial cities or industrial zones of cities are transformed into tourist attractions, which is, among other things, a characteristic of Glasgow and Bilbao); creative cities (cities that encourage the creative industry, such as Barcelona); sports cities (cities that host mega sporting events, such as the Olympic Games, the World Cup and similar sport events); festival cities (cities characterized by cultural events and festivals, like one of the most famous in Rio de Janeiro) and futuristic cities (known for the continuous development of high-tech technologies, but also innovative architecture and ultramodern attractions, such as Dubai or Tokyo).

Considering the mentioned typology, it can be noticed that urban tourist destinations are complex concepts, primarily in terms of content and dimensions of tourist attractions that do not allow their classification into only one thematic category, but the most common case is that based on the observed criteria these destinations can fit in several different categories.

3. BRAND MANAGEMENT OF URBAN TOURIST DESTINATION

Potential tourists would decide to visit a certain urban tourist destination if they perceive it as attractive. Vengesayi and Mavondo (2004) state that this attractiveness is determined by the feelings and beliefs that the destination is capable of giving them the satisfaction they expect from it. The basis of the attractiveness of an urban tourist destination are the physical and social dimensions of tourist attractiveness, which are the reason why tourists decide to visit it. On the other hand, the existence of these dimensions of attractiveness, by itself, is not enough for tourists to visit an urban tourist destination, but it is necessary to have information about them,

based on which they acquire knowledge, create perceptions and develop emotions about them and the destination itself. This is the basic role of brand management. Also, urban tourist destinations with a good brand reduce the perception of risk by tourists of making the wrong decision when choosing a destination.

It is evident that the brand creates expectations from the urban tourist destination, which implies that the quality of the brand directly affects the decision of tourists on which destination to visit. In this sense, well-created messages about the urban tourist destination that are relevant to potential tourists in terms of their needs and motivations arising from them are the starting point in the process of creating the desired brand of the destination. However, for the competitiveness of the destination, it is necessary to develop a special emotional connection, which is why the brand communication must be based on a unique identity and authenticity, both the destination itself and its dimensions of tourist attractiveness.

Tourists today have a great choice when it comes to destinations that can meet their needs, which is why Pike (2005) believes that it is increasingly difficult to distinguish them. This results in them becoming easily replaceable. It is the branding process that should contribute to their identification (Vengesayi, 2003), differentiation (Kladou et al., 2017), and consequently competitiveness and taking the desired position in the tourism market. Very similarly, Blain et al. (2005) believe that the destination brand ensures its recognition, conveys the promise of an unforgettable travel experience associated with the destination and ultimately strengthens memories of pleasant experiences from the destination.

Considering the importance of this strategic process, Dickinger and Laličić (2016) believe that the branding campaign of a tourist destination should shift the focus from functional to emotional attributes, given that functional attributes no longer have the "power" to attract tourists, primarily because of their large similarities in the global tourism market. In that sense, Hudson and Ritchie (2009) cite as a good example the so-called "innovative destinations" that focus on positioning in the minds of stakeholders by branding a destination experience, which should convey the promises of an unforgettable trip that is strongly associated with that destination. In this way, a strong emotional connection is created between the tourist and the destination. Anholt (2006) states that every human activity consists of a rational and emotional part, with city brands supporting the emotional part of every decision about the city and strongly influencing the rational part. Therefore, there are associations such as Paris-romance, Milan-style, Tokyo-modernity, Barcelona-culture, Rio de Janeiro-entertainment.

4. MODELS FOR MEASURING CITY BRANDS AND URBAN TOURIST DESTINATIONS

The World Tourism Organization and the World Tourism Cities Federation (2018) have created a model for measuring city performance related to tourism based on five key performance areas (KPAs): destination management, economic perspective, social and cultural perspective, environmental perspective and technology and new business models. About-France.com (2020) in its report "France's top ten tourist cities" have ranked cities not by size, nor by the number of tourists who actually visit them, but by what they have to offer and their general tourism-friendliness. The ranking takes into account many criteria, notably urban environment and cityscape, museums, historic monuments and other attractions, accessibility, and things to see and do in the immediate vicinity. The Institute for Urban Strategies-The Mori Memorial Foundation (2019) ranks the world's major cities according to their "magnetism", i.e. the ability to attract

people, capital and companies from around the world, which it presents in its Global Power City Index model. Bloom Consulting (2017) in its Digital City Index model measures the interest in a city and its attractiveness based on online searches of people around the world about a city using Digital Demand-D2 software. The World Cities Ranking (2020) in its ranking of The Best Cities analyzes 13 criteria, namely: landmarks (the most important criterion given that landmarks make the city unique and contribute to its attractiveness); location; pedestrian zones; affordability in terms of value for money; security; cleanliness; possibility for shopping; climate; people; Nightlife; public transport; the size and ease of coming to town. Anholt (2006) bases its City Brands Index on a hexagon, with elements relating to people's perceptions of: the presence (city's international status and standing); the place (perceptions about the physical aspects of each city); the potential (considers the economic and educational opportunities that each city is believed to offer visitors, businesses and immigrants); the pulse (explores how exciting people think the cities are, and how easy they think it would be to find interesting things to do, both as a short-term visitor and as a long-term resident); the people (whether the residents are friendly towards foreigners); the prerequisites (perception of the basic qualities of the city).

Saffron (2014) developed The Saffron European City Brand Barometer which measures the strength of city brands through analysis that takes into account various parameters such as: cultural factors, city recognition based on a photo without reading a name or background description, people's association about the city, media recognition, etc. Starting from the fact that coming to and leaving the city by investors, tourists, students and professionals in various fields affect the development of the city, Global City Lab (2019) created The City Brand Valuation Model (CBV model) which aims to assess the brand value of cities and which gets published on the Global Top 500 Cities list.

5. DIMENSIONS OF TOURIST ATTRACTIVENESS SIGNIFICANT FOR BRANDING OF URBAN TOURIST DESTINATION

Urban tourist destinations, among other things, are characterized by attractions that are the reason for the arrival of tourists. Starting from the fact that for different tourists some attractions are more important than others, Leiper (1990) divides them into: primary (known before the trip and that affects the decision to visit), secondary (known before the trip, but do not affect the decision to visit) and tertiary (not known before the trip, so tourists become aware of them at the destination). Boivin and Tanguay (2019) and Brida et al. (2012) have a slightly different approach. They propose a systematization according to which the attractiveness of an urban tourist destination is determined by primary elements, as basic motives for visiting the city, as well as secondary and additional elements that are important for the success of urban tourism. The primary elements include cultural, entertainment and sports facilities, as well as physical and socio-economic characteristics of the destination. Secondary elements include accommodation services and shopping opportunities, while additional elements include parking lots, information centers, tourist guides, landmarks and signposts (Brida et al., 2012: 731; Law, 1992: 603).

To a certain extent, it is possible to agree with the described systematization of the elements of destination attractiveness. However, it represents a general approach to the problem. The complexity of motivational factors, on the one hand, and the tourist attractions of an urban tourist destination, on the other hand, require a more detailed analysis. It is questionable whether, for example, sports or entertainment facilities are the primary attraction for tourists who decided to visit an urban tourist destination motivated by culture as a motivating factor, or shopping opportunities can

be classified as secondary attractions for tourists whose primary motive is shopping. Observing the above, the division into primary, secondary and additional elements/attractions of an urban tourist destination needs to be created depending on the motivating factors of tourists, which implies rejecting the general and accepting a number of different, specific approaches. In addition, it is necessary to observe those attributes of an urban tourist destination that do not independently represent an attraction for tourists, but represent a supplement to primary and secondary attractions in terms of increasing their attractiveness. These are, in fact, the attributes of the destination that become tourist attractions only when they "join" the primary and secondary attractions.

Observing the above considerations, the paper introduces the concept of dimensions of tourist attractiveness, which is a broader concept than tourist attractions, as they include their primary and secondary form, but also those attributes of the destination that do not represent attractions for tourists, but in combination affect expectations and experiences of tourists. Starting from this approach, the paper proposes a division into primary and secondary dimensions of tourist attractiveness, which as such, represent the basis for brand management of an urban tourist destination (Figure 1).

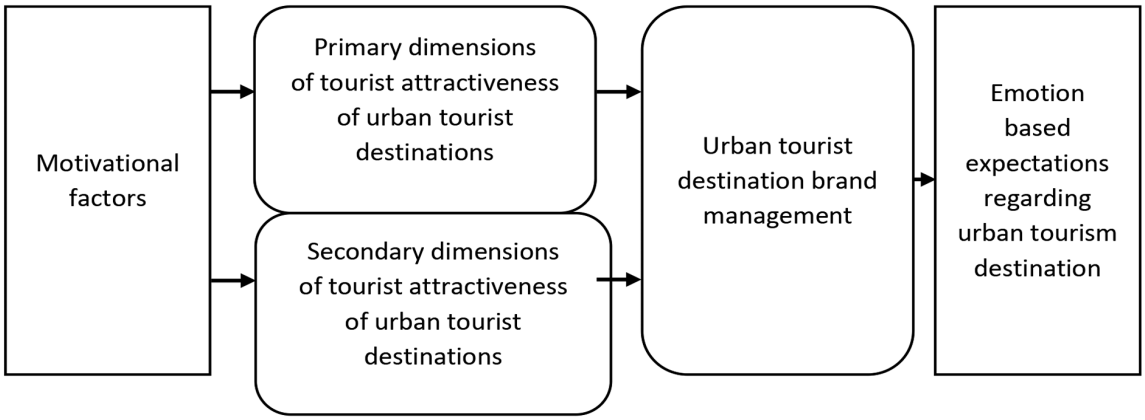

Figure 1. Primary division of dimensions of tourist attractiveness

Source: Authors

On the other hand, starting from the basic division, taking into account the characteristics of the dimensions of tourist attractiveness of urban tourist destinations as criteria, the paper proposes a systematization that includes (Figure 2):

- physical dimensions of tourist attractiveness of urban tourist destinations (tangible/visible tourist attractions, tourist services, certain attributes of the destination that do not represent attractions, but have an impact on tourist experiences, as well as economic characteristics, such as prices of board and non-board services), and
- social dimensions of tourist attractiveness of urban tourist destinations (ambience, atmosphere, authenticity, security).

Tourists and visitors, through brand management, form certain perceptions about physical and social dimensions of tourist attractiveness (as well as an urban tourist destination) based on emotions, as a psychological construct.

In relation to the physical and social dimensions of tourist attractiveness, it is necessary to identify those who have the greatest potential for developing an emotional connection with tourists. This connection should be based on the basic values of the urban tourist destination, its uniqueness and

authenticity, the advantages it offers in relation to the competition, promises of quality experiences and the like. Of special importance in this process is that the urban tourist destination has a so-called "tourist icon" that provides it with global recognition, such as the Eiffel Tower in Paris, the Statue of Liberty in New York, the Acropolis in Athens, the Colosseum in Rome, the Pyramids in Cairo, the Sagrada Familia in Barcelona, the statue of Christ the Redeemer in Rio de Janeiro and others. Other dimensions of tourist attractiveness are also very important in the brand management process, such as: The Rio de Janeiro Carnival, numerous fashion events in Milan and Paris, the Oscars by the American Academy of Motion Picture Arts and Sciences in Los Angeles, the Oktoberfest in Munich, the race with bulls in Pamplona, etc. In addition to the above, urban tourist destinations must be recognized as those that are characterized by the interesting and quality ambience and atmosphere, such as New York, Berlin, Paris and others.

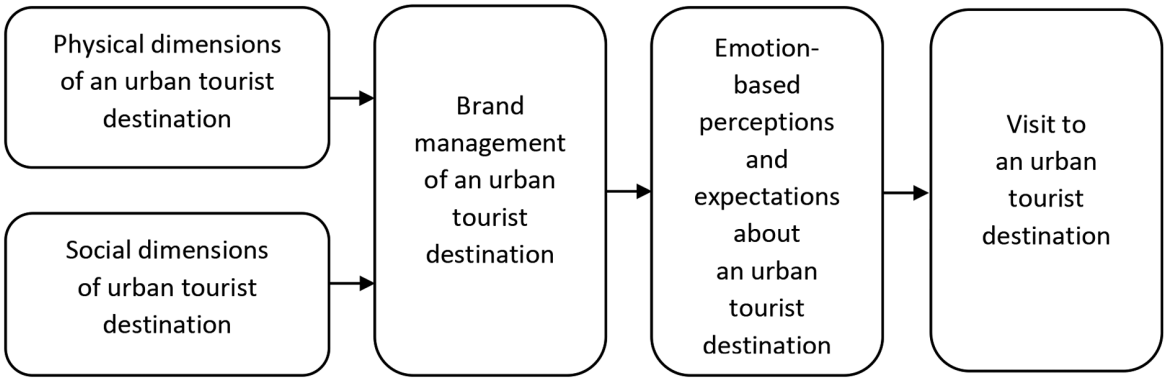

Figure 2. Dimensions of the tourist attractiveness of an urban tourist destination in relation to their characteristics

Source: Authors

6. CONCLUSION

The brand management of an urban tourist destination is based on different dimensions of tourist attractiveness, which are the reason why tourists are interested in the destination and consequently the decision to visit it. Depending on its characteristics, the brand management of an urban tourist destination should focus on those physical and social dimensions of tourist attractiveness that have the greatest potential to establish emotional connection with tourists. These dimensions, individually or jointly, affect the reason for the arrival of tourists, "promising" them pleasures and experiences, which increase the competitiveness of the destination in the global tourism market. At the very core of this approach are needs and motivations, based on which tourists search for urban destinations whose dimensions of tourist attractiveness have the potential to satisfy them by offering what they are looking for, which unequivocally implies the importance of knowing the characteristics of tourists as the most important stakeholders. Today, when urban tourist destinations are affected by the consequences of the COVID 19 pandemic, especially in terms of the reduced number of tourists visiting them, the role of brand management is even more important, given that developed brands have great potential to overcome the crisis situation more easily and with fewer consequences and consequently maintain or even improve their positions on the global tourism market in the post-COVID era.

For the brand management process, it is necessary that urban tourist destinations continuously monitor global trends and innovate their offer. In this sense, it is especially important to explore the concepts of "smart city" and "smart destination", which through information and

communication technologies improve the quality of life, as well as the experience of tourists. It is the concept accepted by the United Nations World Tourism Organization in the Nur-Sultan Declaration on "Smart Cities, Smart Destinations" (UNWTO, 2019). Also, it is necessary to make an analysis of contemporary online media, above all social media, and determine their impact on the branding process of urban tourist destinations, and identify those social media that have the most important role in this process.

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Research on the Evaluation Index System for Urban Sustainable Development

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Abstract: *With the rapid development of industrialisation and urbanisation, many problems and challenges are encountered in urban development. Constructing a scientific and reasonable index system to evaluate the performance of urban sustainability is of great significance to comprehensively improving urban life and growth. This study innovatively built the theoretical framework for the "four-dimensional interactive structure" of sustainable urban development and, combined with the principle of index system construction, established the evaluation index system with four subsystems: environment, economy, society, and science and technology. This lays a foundation for the follow-up empirical analysis and research.*

1. INTRODUCTION

Since the reform and opening-up, China's urbanisation construction has made remarkable achievements, and the urbanisation rate has been advancing rapidly at an average rate of 1% per year. In 2021, the urbanisation rate will be as high as 64.72% (Peng et al., 2021). Although urbanisation plays a positive role in the transformation and upgrading of economic structure, the transformation and upgrading of consumption structure, and the alleviation of overcapacity, the rapid urbanisation process also exposes a series of problems, such as the deterioration of the urban environment and ecology, traffic congestion, housing shortage, and social stability (Ding et al., 2020). The sustainable development of cities has gradually become a new challenge in urban development. In recent years, China has been increasing investment in sustainable urban development. However, due to the lack of systematic and scientific urban sustainable development index systems and evaluation methods, the construction of the index system is not reasonable. Therefore, it isn't easy to theoretically evaluate the status of sustainable urban development in China, whether the measures taken are valid and effective, and whether the expected sustainable urban development goals can be achieved.

2. LITERATURE REVIEW

Many studies have focused on evaluating sustainable urban development (Chen, 2019). Great efforts have been exerted to study urban sustainability at urban, regional, national, and international scales. A list of evaluation systems for urban sustainability composed of various sets of indicators was proposed by global and regional organisations at an early stage, such as the "Driving force-State-Response (DSR)" model developed by The United Nations Commission on Sustainable Development (UNCSD) (Dantas et al., 2021), "Pressure-State-Response (PRS)"

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model employed by the Organization for Economic Cooperation and Development (OCED), "Society-economy-environment" framework proposed by United Nations Environment Programme(UNEP) (Chopin et al., 2021) and "Expanding the Measure of Wealth: Indicators of Environmentally Sustainable Development" developed by the World Bank (Chebaeva et al., 2021). However, these index systems pay more attention to constructing theoretical frameworks of sustainable development and do not meet the actual demands of different countries. Later, these frameworks were used as references for many countries and communities to develop their systems at a national scale, such as member states of the European Union (Karjalainen & Juhola, 2021), the UK (Michalina et al., 2021), and Singapore (Hegazy et al., 2021). Based on its actual situation, China also built index systems with Chinese characteristics by different governmental agencies. For Example, the Sustainable development index system of China organised by the Ministry of Science and Technology, the sustainable development evaluation index system of experimental areas of the State Science and Technology Commission, and the sustainable development Index system of the Sustainable Development Strategy Research Group of the Chinese Academy of Sciences (Yi et al., 2021).

Meanwhile, many scholars began to study sustainable development on an urban scale. Researcher Mao Hanying created the sustainable development index system framework in Shandong Province in the *Preliminary Study on the Index System of Sustainable Development* (Mao, 1996). The index system established includes four subsystems, including the economic growth subsystem, social subsystem, resource environment subsystem, and sustainable development ability subsystem, with one subject layer and 90 essential index factors. Xiong Xuezhen et al., for example, according to the nature of environmental bearing capacity, the structure and function of the external environment system, and performance, believed that the index system of environmental carrying capacity should reflect the exchange of material, energy, and information between the environment and the social and economic system, the indicators are divided into natural resources supply, support social conditions and pollution capacity indexes from three categories (Xiong et al., 2022). Sun Jiuxia et al. summarised the indicators for evaluating sustainable urban development into economic, social, and environmental indices. Finally, they integrated them into the "coordination degree" index (Sun & Wang, 2022).

By systematically combing the domestic literature, we can find that the existing research work on the sustainable development index system in China reflects a good level of administrative divisions and industry divisions; these index systems are based on different modes of creation, absorb the strategic idea of sustainable development, and show good systematicity and hierarchy. It has laid a good foundation for the research and comparative analysis of China's sustainable development index system.

At the same time, the domestic and foreign sustainable development indicator system also has many problems. The index system is complex, and the number of indicators is too large, making it difficult to operate.

3. RESULTS AND DISCUSSION

Theoretical analysis of the evaluation index system of sustainable urban development. From the perspective of system theory, sustainable urban development is a scientific system that reflects the overall development of human society. It is not only related to the development of each subsystem of environment, economy, society, and science and technology but also the relationship

and interaction between each subsystem (Han et al., 2021; Hongyue & Koblianska, 2021). Urban sustainable development is a complex and systematic problem. Therefore, this study first discusses the system structure of sustainable urban development and the division mechanism of a four-dimensional complex system from the perspective of system theory and then establishes a scientific evaluation index system of sustainable urban development.

The system is composed of many interrelated and interdependent elements. According to the complex system theory, the subject of this study is treated as a complex system problem. Then it meets the three necessary conditions that the system should have: first, it is composed of the main elements such as environment, economy, society and science and technology; Secondly, the aspects of the environment, economy, society and science and technology are interrelated and interacted with each other, and there are cross-vertical and horizontal structures and orders among them. Third, this complex system has its specific functions and roles. The process of sustainable urban development depends on the elements of the environment, economy, society and science and technology and their reciprocal links and structures. So, suppose we want to evaluate the urban sustainable development ability. In that case, we must use the thought of the system, from the perspective of the system, clear the component elements of sustainable urban development of this system and its specific content and function, and use the scientific method of concise evaluation of urban sustainable development system the various components of the underlying index, eventually forming a complete set of index system (Hongyue et al., 2022).

According to the urban sustainable development system framework analysed in this study, the theoretical framework for the establishment of the urban sustainable development evaluation index system can be obtained, as shown in Fig. 1.

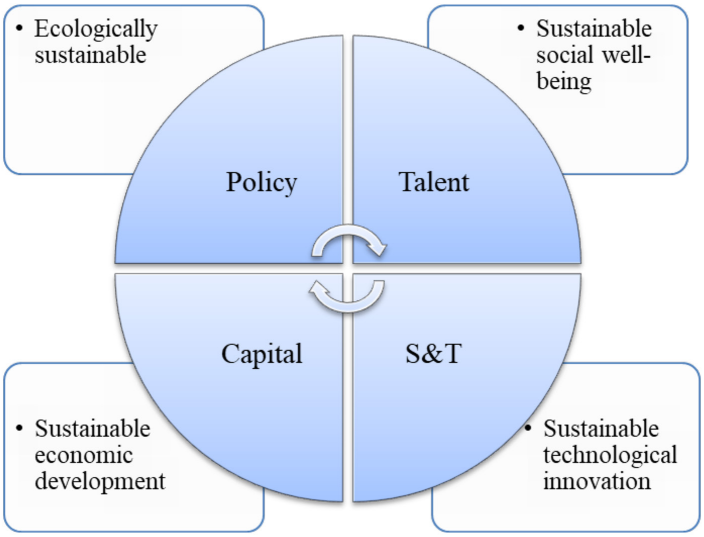

Figure 1. The theoretical framework of "four-dimensional interactive structure" for regional sustainable development

Source: authors' development

Figure 1 shows four core carriers of sustainable urban development: policy, talent, capital, and science and technology. Regardless of system and dimension, if we want to promote sustainable development, we must start from the four aspects of policy, talent, capital, and science and technology. From the point of view of each subsystem of sustainable urban development, the most direct and vital way is through capital investment to realise the sustainable economic

development of the economic subsystem. To realise the sustainable innovation of the science and technology subsystem, the most intuitive and core is to rely on science and technology development; To realise the sustainable ecological environment of an environmental subsystem, the most critical and universal way is to rely on the guidance and norms of relevant policies. The most effective and scientific way to achieve sustainable social well-being of social subsystems is through the wisdom, ability, and relationships of talents. Because society is a collection of people, people are the main body of scientific and technological development, science and technology is the carrier to promote social progress and economic development, a policy is a bridge to achieve the goal of sustainable development of the economy, society, environment, science, and technology, so policy, talent, capital and science, and technology are interrelated with the four subsystems of sustainable urban development and cannot be separated.

Furthermore, looking at the intuitive performance of the four subsystems to achieve sustainable development, the functioning of a sustainable ecological environment is the effective implementation of laws and regulations on energy conservation and environmental protection. When society changes from labour-intensive to knowledge-intensive and talent-intensive, it meets the requirements of social well-being and sustainable development. Sustainable economic growth is mainly manifested in the advocacy of a low-carbon economy, green industry, green enterprises, and other similar entities occupying a dominant position, and so on.

The intuitive manifestation of sustainable development of science and technology is the organic combination of the Internet and renewable energy. The research and development of energy-saving and environmental protection science and technology have made adequate progress (Hongyue et al., 2022). The four subsystems' sustainable development goals and performances are different, but they can be effectively connected and interact with each other. For example, the sustainable macroscopic performance of science and technology and social subsystems is establishing and developing "science and technology think tanks". The sustainability of the environment and society can be achieved by building a two-oriented society: a resource-saving society and an environment-friendly society. The sustainability of the economy and environment can be realised by entering the post-carbon era of new energy. The sustainability of technology and the economy needs to be implemented by adhering to the essence of the third industrial revolution.

Construction of urban sustainable development evaluation index system. Combined with the theoretical connotation of sustainable urban development, according to the principles of scientific, systematic, practical significance, and data availability, this study condensed the index system including environment, economy, society, science, and technology, four dimensions of 20 sub-indicators (Table 1).

An environmental subsystem is the essence of sustainable development. Development without ecological protection, pollution control, and new energy development and utilisation can never be called "sustainable development". Therefore, there is no doubt that the environmental subsystem is a subsystem of sustainable urban development. The indicators of the environmental subsystem include the daily treatment capacity of urban sewage (A1) and the harmless treatment rate of domestic waste (A5), which reflect environmental pollution control capacity. Total sulfur dioxide emission (A3) and Discharge amount of industrial wastewater (A4) reflect environmental pollution degree, and green coverage in built-up areas (A2) reflects the achievements of ecological environment construction.

Table 1. Urban sustainable development evaluation index system

Criterion Layer	Index Layer	Index Unit	Index attribute
Ecological environment (A)	Daily treatment capacity of urban sewage (A1)	Million cubic meters	Positive
	Green coverage in built-up areas (A2)	%	Positive
	Total sulfur dioxide emission (A3)	Ten thousand tons	Negative
	Discharge amount of industrial wastewater (A4)	Ton	Negative
	Harmless treatment rate of domestic waste (A5)	%	Positive
Economic development (B)	Per capita gross regional product (B1)	Yuan	Positive
	Total retail sales of consumer goods (B2)	Billion yuan	Positive
	Water consumption per ten thousand yuan of GDP (B3)	Cubic meter million	Negative
	Power consumption per ten thousand yuan of GDP (B4)	KWh/ billion yuan	Negative
	Proportion of tertiary industry (B5)	%	Positive
Social well-being (C)	Health technicians per 10,000 people (C1)	Person	Positive
	Social security and employment expenditure (C2)	Billion yuan	Positive
	Urban population density (C3)	Person/km2	Negative
	Urban green space area (C4)	Ten thousand hectares	Positive
	Urban registered unemployment rate (C5)	%	Negative
Science and technology innovation (D)	The R&D expenditure of industrial enterprises (D1)	Ten Thousand Yuan	Positive
	The turnover of technology market (D2)	Billion yuan	Positive
	The financial expenditure on science and technology (D3)	Billion yuan	Positive
	The amount of domestic patent application authorization (D4)	Term	Positive
	The full-time equivalent of R&D personnel of industrial enterprises (D5)	Person/year	Positive

Source: authors' development

On the issue of sustainable urban development, economic factors are the basis for realising social well-being, technological innovation, and resource protection. The economic subsystem indicators include per capita gross regional product (B1) and proportion of tertiary industry (B5), which reflect the economic scale, measure the economic development status and examine the comprehensive strength of the city. Water consumption per ten thousand yuan of GDP (B3) and power consumption per ten thousand yuan of GDP (B4) reflect resource consumption in economic activities. Total retail sales of Consumer Goods (B2) reflect people's consumption level and purchasing power of social goods and indirectly reflect a city's economic development level.

Social subsystems are the root of sustainable urban development, and social well-being is the fundamental criterion for measuring sustainable development. Social subsystem indicators include health technicians per 10,000 people (C1) and social security and employment expenditure (C2), which reflect the government's ability to provide public goods and services. Urban population density (C3) and urban green space area (C4) reflect residents' quality of life. The urban registered unemployment rate (C5) reflects the basic level of urban social development.

The science and technology subsystem is the driving force for the city's sustainable development. The science and technology subsystem indexes include the R&D expenditure of industrial enterprises (D1) and the financial expenditure of science and technology (D3), which reflect the importance and investment of the government and enterprises in innovation. The turnover of the technology market (D2) and the amount of domestic patent application authorisation (D4) reflect a city's technological innovation achievements. The full-time equivalent of R&D personnel of industrial enterprises (D5) reflects the number of urban talents.

4. CONCLUSION

This research innovatively constructs the theoretical framework of the "four-dimensional interactive structure" of urban sustainability from multiple perspectives and disciplines. Based on this theoretical framework, combined with scientificity, systematisation, practical significance, and data availability, an urban sustainable development evaluation index structure system with 20 underlying indicators in four subsystems is finally established. It lays a foundation for the follow-up empirical analysis and research.

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Specifičnosti analize osetljivosti u oceni međunarodnih investicionih projekata*

Specifics of Sensitivity Analysis in the Evaluation of International Investment Projects

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Apstrakt: *Simulaciona tehnika analiza osetljivosti, kao metodološki postupak za ocenu opravdanosti investicionih projekata u uslovima neizvesnosti treba da ukaže na koje inpute je projekat najosetljiviji. Ocena se vrši pretvaranjem ulaznih veličina u kvantitativne veličine i postavljanjem kvantitativnih kriterijuma za ocenu osetljivosti. Cilj rada je analiza u kojoj meri se rizici koje donosi poslovanje u globalnom okruženju mogu unapred predvideti i kvantifikovati i procena adekvatnosti analize osetljivosti za ocenu projekata u uslovima neizvesnosti. Ukazano je na specifičnosti analize osetljivosti i porast rizika koje nameću međunarodno poslovanje i najnovija svetska dešavanja. Analizom je utvrđeno da je neke oblike rizika moguće predvideti, kvantifikovati i koristiti u oceni isplativosti investicionih projekata. Novija dešavanja u globalnom okruženju, vezana za pandemiju i geopolitičke odluke u velikoj meri poput domino efekta utiču na veći broj rizika koji ne smeju biti zanemareni prilikom ocene isplativosti međunarodnih investicionih projekata.*

Abstract: *The simulation technique of sensitivity analysis, as a methodological procedure for assessing the justification of investment projects in conditions of uncertainty, should indicate which inputs the project is most sensitive to. The assessment is performed by converting the input quantities into quantitative quantities and setting quantitative criteria for the sensitivity assessment. The aim of this paper is to analyze the extent to which the risks posed by doing business in a global environment can be predicted and quantified in advance and assessing the adequacy of the sensitivity analysis for project evaluation in conditions of uncertainty. The specifics of the sensitivity analysis and the increase in the risks that international business and the latest world events impose were pointed out. The analysis shows that some forms of risk can be predicted, quantified and used in assessing the profitability of investment projects. Recent developments in the global environment, related to the pandemic and geopolitical decisions, like the domino effect, greatly affect a number of risks that must not be neglected when assessing the profitability of international investment projects.*

1. UVOD

Globalizacija i razvoj novih tehnologija doprinele su disperziji poslovanja kompanijama širom sveta bez obzira na njihovo mesto osnivanja. Kompanijama je pružena mogućnost da investiraju u zemlje gde su jeftiniji resursi i da ostvaruju veću konsolidovanu dobit. Prilikom ulaganja u međunarodnom okruženju kako bi se unapred predvidela isplativost investicija obično se koristi koncept upravljanja projektima. Unapred se predviđaju svi inputi (prihodi, rashodi, cena kapitala, cena kredita, novčani tokovi) i uz pomoć dinamičkih pokazatelja isplativosti projekata, neto sadašnje vrednosti, interne stope rentabilnosti i perioda povraćaja vrši se procena isplativosti međunarodnih projekata.

Zbog povećanog rizika i neizvesnosti poslovanja koje nameće globalno poslovanje, i česte promene cena inputa, vrši se simulaciona tehnika analiza osetljivosti projekata. Na taj način se računskim postupkom simulacije predviđa uticaj promena ulaznih podataka na izlazne rezultate jednog modela i utvrđuje na koje inpute je projekat najosetljiviji.

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Uspešan postupak simulacije determinisan je prvenstveno procenom da li su svi rizici koje nameće globalno okruženje uzeti u obzir i da li se uticaj tih rizika može kvantitatifikovati preko pojedinih inputa.

Pandemija izazvana korona virusom i najnovija svetska dešavanja uticali su na povećan broj rizika koji se moraju razmatrati prilikom primene simulacione tehnike analize osetljivosti jer su posledice višestruke. Ograničen protok ljudi, roba i usluga, obavezna vakcinacija kao uslov za ulazak u određene zemlje, zabrana okupljanja većeg broja ljudi koje je donela pandemija, uticale su na porast rizika koji se mora uzeti u obzir prilikom simulacije analize osetljivosti. Geopolitičke odluke izazvane rusko-ukrajinskim sukobom doprinele su rastu cena energenata, građevinskog materijala, koji će doprineti inflatornim pritiscima, što takođe treba imati u vidu prilikom korišćenja analize osetljivosti.

2. USPEŠNA OCENA MEĐUNARODNIH INVESTICIONIH PROJEKATA

Za adekvatnu procenu isplativosti međunarodnih investicionih projekata vrši se dinamička ocena efikasnosti projekata. Neto sadašnja vrednost, interna stopa rentabilnosti i period povraćaja koriste se kao kriterijumi za investiciono odlučivanje. U slučaju odlučivanja između dve alternative biraju se projekti koji imaju veću neto sadašnju vrednost, veću internu stopu rentabilnosti i kraći period povraćaja.

Neto sadašnja vrednost je zbir svih diskontovanih neto priliva u vremenskom periodu trajanja projekta. Svi investicioni predlozi sa pozitivnom neto sadašnjom vrednošću su prihvatljivi, a oni koji imaju negativnu vrednost su neprihvatljivi. Projekti koji imaju nultu vrednost su od marginalnog značaja. Interna stopa rentabilnosti ili interna stopa prinosa predstavlja maksimalnu vrednost kamatne stope koju može da plaća projekat za pozajmljene resurse i da pri tom ostvaruje nultu profitabilnost. Ona predstavlja onu diskontnu stopu koja u planiranom vremenskom periodu trajanja projekta svodi njegovu neto sadašnju vrednost na nulu. Period povraćaja određuje vremenski period u kojem će se neto sadašnja vrednost projekta izjednačiti sa nulom, odnosno utvrđuje se vremenski period za koji diskontovani neto prilivi nadoknađuju iznos početne investicije. Projekat je prihvatljiv ako je period povraćaja manji od planiranog vremena za eksploataciju projekta (Pejović, 2018., str.115-116).

Nakon predviđanja inputa, predviđaju se novčani tokovi za vremenski period trajanja projekta i vrši se njihovo diskontovanje, da bi se budući novčani tokovi sveli na sadšnju vrednost. Dobro investiciono odlučivanje uslovljeno je odabirom adekvatne diskontne stope. Odabir mnogo velike ili male diskontne stope dovodi do precenjivanja ili podcenjivanja vrednosti pokazatelja. Odabir adekvatne diskontne stope vrši se shodno ličnom znanju i preferencijama investitora. Diskontna stopa bi trebalo da predstavlja kamatnu stopu na tržištu kapitala koja se koriguje za premiju rizika.

Najvažniji faktori koji utiču na izbor diskontne stope su finansijsko stanje kompanije koja ulaže, finansijski miks, u smislu cene pozajmljenih resursa i cene sopstvenih izvora finansiranja, ekonomska situacija, kretanja u industriji u kojoj kompanija posluje, odnos ponude i potražnje i rizik zemlje. Ako se polazi od novčanog toka nakon otplate duga diskontna stopa će se zasnivati na oportunitetnoj ceni kapitala, dok će se za diskontovanje novčanog toka pre servisiranja dugova koristiti diskontna stopa na osnovu ponderisane prosečne cene kapitala. Odabir odgovarajuće diskontne stope zahteva da se uzmu u obzir svi prihodi, ali i rashodi u skladu sa tržišnim cenama (Putri, 2020, str. 79).

Najčešći razlozi koji se navode za neuspeh projektnog finansiranja ili ostvarivanja slabijih rezultata projekta od onih rezultata projekta koji su planirani su: kašnjenje u završetku projekta koje povećava troškove finansiranja izgradnje i prolongira njegovo efektuiranje kroz prihode, prekoračenje kapitalnih troškova, tehničke i slične greške, finansijski propusti ugovarača, mešanje države u realizaciju projekta, neosigurani slučajevi štete, povećanje cene ili nedostatak sirovina, tehnička zastarelost postrojenja, eksproprijacija, loš menadžment (Kapor, 2007. str. 107-108).

Realizacija međunarodnih projekata tokom pandemije izazvane virusom Covid-19 postavlja nove izazove za investitore. Utvrđivanje da li su i u kojoj meri projekti profitabilani može se ispravno izračunati samo ako se pri predviđanju primenjuje diskontna stopa za novčane tokove koja pored svih rizika izazvanih međunarodnim poslovanjem obuhvata i sve dodatne rizike koje donosi pandemija. Ulaganja u oblasti turizma, saobraćaja, usluga hotelijerstva, keteringa, organizacije događaja koji obuhvataju brojna okupljanja ljudi, kao na primer sportski događaji, koncerti, zahtevaju veće diskontne stope. Svi projekti koji zahtevaju okupljanje većeg broja ljudi, njihovo kretanje tokom pandemije, dodatno je rizično. Sve dok se pandemija ne završi, ili bar ne stavi pod kontrolu, zbog zdravstvene zaštite stanovništva, ulaganja u ove industrijske oblasti trebalo bi odložiti ili u obračunu njihove isplativosti treba biti objektivniji. Pri izboru diskontne stope koja se koristi za procenu budućh novčanih tokova, najvažnije je uključiti sve rizike koji mogu uticati na implementacija projekta (Pejović i dr., 2020, str. 134).

Iako je pandemija trenutno u završnoj fazi jer se broj obolelih smanjuje i vakcinisan je veliki broj stanovništva, treba imati u vidu da se ovakve stvari mogu dešavati i u budućnosti. Kolektivni imunitet je u većini zemalja postignut. Posledice pandemije ostavile su neizbrisiv trag na ekonomije, čak i najrazvijenijih zemljama sveta.



Slika 1. Ocena opravdanosti investicionih projekata
Izvor: Jovanović, 2006.

Analiza osetljivosti pomaže de se sagleda uticaj različitih parametara na promenu vrednosti pojedinih kriterijuma i da se utvrdi uticaj promena na ocenu isplativosti investicionog projekta.

3. SPECIFIČNOSTI ANALIZE OSETLJIVOSTI

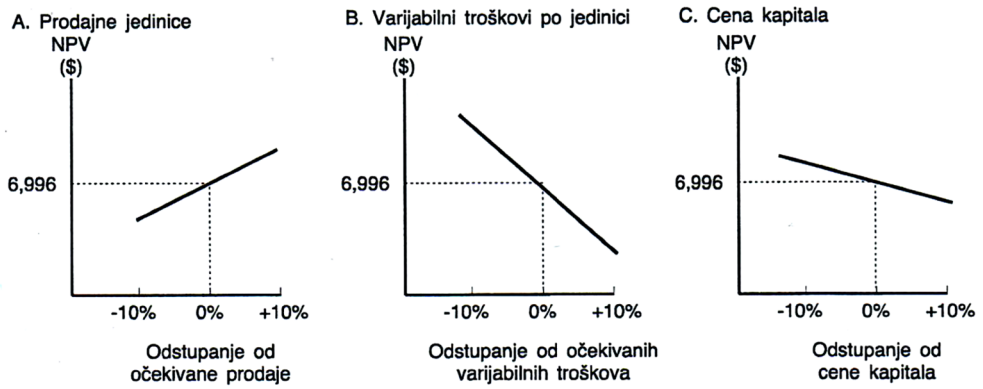
Analiza osetljivosti se koristi za preispitivanje odluke radi utvrđivanja u kojoj meri se može tolerisati netačnost pretpostavki na kojima odluka počiva, a da se pri tom ne ugrozi validnost same odluke. Ona podrazumeva sistematsko variranje jedne po jedne pretpostavke i prati se u kojoj meri njihova promena može uticati na promenu odluke. Svaka promenljiva se menja za nekoliko procentnih poena iznad ili ispod očekivane vrednosti, pod uslovom da ostali parametri ostaju konstantni. Kao računski postupak predviđanja uticaja promena ulaznih podataka na izlazne rezultate jednog modela, koristi se prilikom donošenja investicionih odluka u uslovima neizvesnosti.

Uspešnost primene analize osetljivosti zavisi od toga sa kojom preciznošću su svi rizici koji utiču na projekat obuhvaćeni. Proces upravljanja rizicima zahteva prvenstveno njihovo identifikovanje, merenje, ispitivanje mogućih rešenja, primenu rešenja i kontrolu razultata. Kamatni rizik, devizni rizik, rizik likvidnosti, rizik zemlje, opertivni rizik, moraju biti adekvatno procenjeni i kvantitativno predstavljeni. Veličina diskontne stope bi trebalo da kvantitativno objedini sve izloženosti rizicima.

Preporučena procedura za procenu rizika zasniva se na analizi osetljivosti, kao prvom koraku, koja predstavlja računski postupak predviđanja uticaja promena ulaznih podataka na izlazne rezultate jednog modela. Drugi korak predstavlja studija raspodele verovatnoće za odabrane promenljive, kao i računanje očekivane vrednosti indikatora performansi projekta (Mičić i dr., 2020., str. 12).

Analiza osetljivosti treba da pokaže na koje inpute je projekat najosetljiviji. Simulacijom se utvrđuje u kojoj meri odstupanje od planiranih vrednosti utiče na promenu neto sadašnje vrednosti i ispitivanje ishoda investicione odluke pre njene realizacije.

Na slici broj 2 grafički je predstavljeno kako odstupanje prodajne cene, varijabilnih troškova i cene kapitala utiče na neto sadašnju vrednost. Na datom primeru, na osnovu nagiba grafika može se ustanoviti da je analizirani projekat najosetljiviji na promenu varijabilnih troškova po jedinici proizvoda. Veći nagib ukazuje na veću osetljivost neto sadašnje vrednosti projekta. Što je kosina veća, veća je i osetljivost neto sadašnje vrednosti na promenu te promenljive. Razmatranje uticaja pojedinih ulaznih veličina, podrazumeva da su svi ostali inputi konstantni.



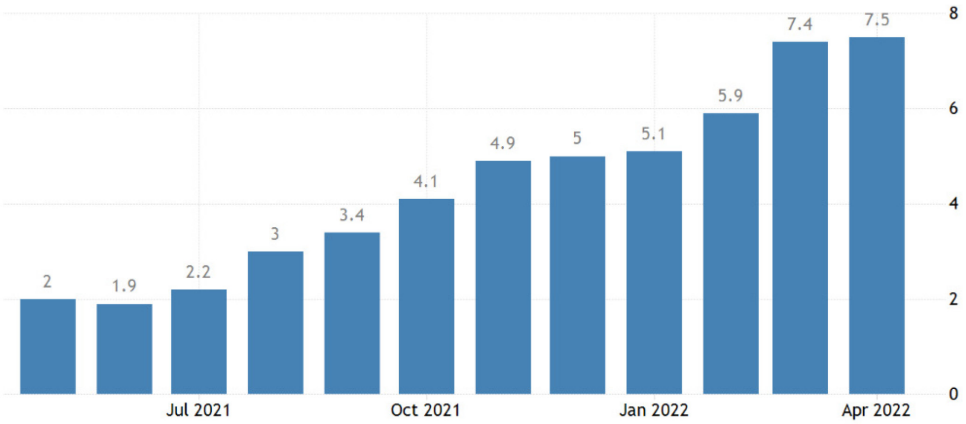
Slika 2. Analiza osetljivosti
Izvor: Cvetković, 2008.

Pandemija izazvana korona virusom doprinela je izloženosti međunarodnih projekata većem stepenu rizika. Smanjen protok ljudi i ograničavanje kretanja uvođeno je iz objektivnih razloga sa ciljem zaštite od širenja i prenošenja infekcije. Ne treba zanemariti i subjektivne razloge ograničenog kretanja stanovništva uzrokovanog strahom od infekcije. Svi projekti čija je realizacija planirana pre nastupanja pandemije sigurno nisu ostvarili planirane prinose na investicije. Neke rizike je moguće predvideti, kvantifikovati i analizirati njihov uticaj na neto sadašnju vrednost, a pandemija se ipak može svrstati u kategoriju „više sile".

Rusko-ukrajinski sukob uticao je na porast cena energenata od kojih zavisi veliki broj industrija. Skok cena nafte i gasa uticaće na rast cena u svim industrijama. Uvođenje sankcija Rusiji od strane zemalja koje su zavisne od ruskih energenata trenutno proizvodi samo kontra-efekte.

Stopiranje isporuke gasa evropskim zemljama može imati nesagledive posledice na industrije svih evropskih zemalja, a posebno Nemačke. Rast cena osnovnih energenata, hrane i sirovina poput domino efekta sigurno će uticati na opšti rast cena.

Građevinska industrija je posebno pogođena ovim sukobom. U građevinskoj industriji obično se prodaja objekata realizuje pre završetka izgradnje i često se kompenzacija koristi kao način finansiranja građevinskih projekata. Nagli porast cena građevinskog materijala uticaće loše na isplativost građevinskih projekata, jer je bilo teško predvideti kako će ovaj sukob uticati na kretanje cena. Osim rasta cene energenata, čelika, repromaterijala, očekuje se rast i svih resursa u građevinskoj industriji. Prodaja pre završetka izgradnje predstavlja dodatni rizik. Za izbegavanje ove vrste rizika, investitori bi trebali da se unapred zaštitite u kupo-prodajnim ugovorima prilikom prodaje stanova i poslovnih prostora, da će doći do rasta prodajne cene u slučaju da dođe do rasta cena repromaterijala.



Grafikon 1. Kretanje stope inflacije u evro zoni u poslednjih godinu dana
Izvor: Euro Area Inflation Rate - April 2022 Data - 1991-2021 Historical - May Forecast (tradingeconomics.com)

Godišnja stopa inflacije u evrozoni porasla je na novi rekordnih 7,5% u aprilu 2022. sa 7,4% u martu, i uglavnom u skladu sa tržišnim očekivanjima, pošto su sukob u Ukrajini i sankcije Rusiji nastavili da guraju cene roba naviše, pokazale su preliminarne procene. Inflacija je sada više od tri puta iznad cilja ECB od 2%. Cene su brže napredovale za hranu, alkohol i duvan (6,4% prema 5,0% u martu), neenergetska industrijska dobra (3,8% prema 3,4%) i usluge (3,3% prema 2,7%). U međuvremenu, cene energije su usporile, ali su ostale izuzetno visoke (38% prema 44,4%). Bez energije, inflacija je takođe porasla na 4,2% sa 3,4%, a bez energenata, hrane, alkohola i duvana na 3,5% sa 2,9%. (Euro Area Inflation Rate - April 2022 Data - 1991-2021 Historical - May Forecast (tradingeconomics.com))

Zadržavajući ranije izgrađene elemente svoje geopolitičke moći i izvora političkog uticaja na međunarodnom planu, nuklearnu moć i pravo veta u Savetu bezbednosti Ujedinjenih nacija, u novije vreme energetska moć Rusije postaje sve snažniji faktor jačanja položaja i uticaja Rusije u njenim međunarodnim odnosima. (Jeftić, Šarčević i dr., 2013, str. 444-445).

4. ZAKLJUČAK

Analiza osetljivosti kao simulaciona tehnika treba da ukaže na koje inpute je projekat najosetljiviji. Poslovanje u međunarodnom okruženju zahteva objektivno sagledavanje i uzimanje u obzir svih rizika kojima je projekat izložen. Adekvatnim postupkom upravljanja rizicima može

se uticati na smanjenje izloženosti projekta njihovom uticaju. Diskontna stopa koja se koristi za diskontovanje novčanih tokova u obračunu neto sadašnje vrednosti treba da anticipira sve rizike koje mogu uticati na projekat. Pandemija uzrokovana korona virusom i rusko-ukrajinski sukob ukazali su na to da je kretanje cena glavnih inputa svih projekata teško predvideti i da na njihovu cenu više mogu uticati geopolitičke odluke, nego odnos ponude i tražnje. Dobra procena isplativosti međunarodnih projekata uslovljena je dobrom procenom svih potencijalnih rizika i utvrđivanjem uticaja koji dati rizici imaju na realizaciju projekata.

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Digitalna transformacija špediterskog i carinskog poslovanja tokom pandemije COVID-19

Digital Transformation of Shipping and Customs Business during the COVID-19 Pandemic

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E-customs;
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Digitalization;
FIATA

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Saţetak: *Špeditersko tržište je na velikoj prekretnici usled pandemije koja diktira novi narativ u poslovanju imajući u vidu promene koje su kompanije pretrpele u svim sektorima. Kovid-19 je inicirao špeditere, logističare i carinike da ponovo procene strategiju i realizaciju lanaca snabdevanja u skladu sa novim tehnologijama, digitalizacijom. Uvođenje digitalnih rešenja će biti u fokusu rada svih učesnika u lancu snabdevanja jer će primenom unapređivati kvalitet svoje usluge i na taj način obezbeđivati adekvatan nivo konkurentnosti na tržištu. Nastali digitalni trendovi s lakoćom nadvladavaju tradicionalne oblike poslovanja u želji da se prevaziđu postojeći logistički zastoji. Automatizacija poslovnih procesa, razne aplikacije i platforme pružaju dodatu vrednost svim učesnicima u logističkom poduhvatu kroz smanjenje troškova poslovanja. Jedna od prednosti je i personalizacija logističkih i špediterskih usluga kroz kreiranje i obradu velike količine podataka. U radu se razmatra način na koji se carinici i špediteri hvataju u koštac sa digitalnom transformacijom. Digitalna transormacija u špediterskoj branši se odvija na tri nivoa. Prvi nivo je nova digitalna strategija FIATA špediterskog udruženja ka kreiranju jedinstvnih elektronskih dokumenata. Drugi nivo su različite inicijative (IATA One Record, FEDeRATED, FENIKS ili IPCSA NoTN) kako bi se olakšala međusobna povezanost postojećih sistema, omogućavajući akterima lanaca snabdevanja da razmenjuju informacije, a da pritom zadrže kontrolu nad svojim. Treći nivo je digitalizacija samih špediterskih preduzeća kroz uvođenje novih softverskih rešenja. Carinski sistemi napreduju nezavisnim kolosekom ka digitalizaciji. Pristupačni, sigurni, integrisani, interoperabilni elektronski carinski sistemi olakšali su elektronske carinske formalnosti kako bi se olakšala logistika u lancu snabdevanja prilikom kretanja robe u/i van EU. Kompatibilni IT carinski sistemi su izgrađeni u skladu sa međunarodnim standardima u pogledu skupova podataka čime se omogućavaju interakcije sa carinskim sistemima među zemljama.*

Abstract: *The freight-forwarding market is at a tipping point because of the pandemic which dictates a new narrative in business with the changes companies have gone through in all sectors. Covid-19 initiated freight-forwarding, logisticians and customs officers to re-assess their strategy and realization of supply chains in line with new technology and digitalization. Introducing digital solutions will be the focus of every part of the supply chain as it will increase the quality of their services and so secure an adequate level of competitiveness in the market. Digital trends surpass traditional business with ease in hopes of clearing existing logistical bottlenecks. Automation of business services, various applications and platforms offers value to all participants in logistical achievements by decreasing cost. One benefit is the personalization of logistical and freight-forwarding services through the creation and processing of data. This work considers how customs officers and forwarders tackle digital transformation. Digital transformation in the freight-forwarding branch occurs on three levels. The first level is the new digital strategy of the FIATA freight-forwarding association for creating individual electronic documents. The second level encompasses different initiatives (IATA One Record, FEDeRATED, FENIKS, or IPCSA NoTN) to further connect existing systems, allowing supply chain participants to exchange information and still maintain control over their information. The third level represents the digitalization of the freight-forwarding companies themselves by introducing new software solutions. Customs systems advance at their own pace towards digitalization. Accessible, safe, integrated, interoperable electronic customs systems have eased electronic customs formalities to ease logistics in the supply chain when moving goods into/out of the EU. Compatible IT customs systems are built following international standards in terms of data sets which allows interaction with customs systems between countries.*

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1. UVOD

Kako se digitalizacija sve više širi, ubrzava i unapređuje tako se stvaraju i novi digitalni trendovi koji s lakoćom nadvladavaju tradicionalne oblike poslovanja. Razne aplikacije i platforme smanjuju troškove poslovanja, ali i stvaraju velike količine podataka koji omogućuju personalizaciju samih proizvoda koje poduzeće nudi. Digitalna transformacija nije više pitanje pojedinačnih odluka već obavezna strategija i odluka koja je od vitalnog značaja za dalje poslovanje (www.capgemini.com). Vrlo je važno prepoznati poziciju i koristi koje se mogu ostvariti transformacijom poslovanja, zauzeti stav, te definisati put prema digitalnoj transformaciji poslovanja. Kada je riječ o transformaciji poslovanja u digitalni oblik, važno je napomenuti da to nije jednokratna operacija, već dugotrajna poslovna strategija i odluka koja temelje treba imati u pripremi poslovanja i za izazove budućnosti (Matijas, 2021).

Mnoge kompanije nisu tretirale digitalnu transformaciju kao hitno pitanje, barem ne dok digitalizacija nije postala nužna, kao rezultat pandemije Kovida-19. Tokom pandemije potrošači su se dramatično okrenuli ka onlajn kanalima i kompanije su odgovorile na isti način. Pandemija Kovida-19 je stvorila novi narativ kada govorimo o načinu poslovanja, imajući u vidu promene koje su kompanije pretrpele u svim sektorima (Jasari,2020). U radu se razmatra način na koji se carinici i špediteri hvataju u koštac sa digitalnom transformacijom. Digitalna transormacija u špediterskoj branši se odvija na tri nivoa. Preko FIATA špediterskog udruženja ka kreiranju jedinstvnih elektronskih dokumenata; putem različitih inicijativa za umrežavanje (IATA One Record, FEDeRATED, FENIKS ili IPCSA NoTN); kroz digitalizacija samih špediterskih preduzeća kroz uvođenje novih softverskih rešenja. Bez koherentnih carinskih digitalnih sistema koji prate špeditersku industriju ne bi bilo integrisanog logističkog lanca.

2. DIGITALIZACIJA ŠPEDITERSKIH PREDUZEĆA I TMS

Svi akteri u lancu snabdevanja sve više traže veću vidljivost i transparentnost. Otpremnici, prevoznici i špediteri proizvode sve više podataka, uz potrebu za njihovom razmenom. Nedostatak standarda ili promena standarda po transportnom domenu ugrožava interoperabilnost različitih sistema koji se koriste. Da bi sistem bio uspešan, mora imati jaku integraciju sa sistemima operatera i izvorima podataka, sa druge strane mora olakšati unos narudžbina kupaca koje određuju šta se šalje. Digitalna strategija bi trebalo da se uhvati u koštac sa ovim problemom. Cilj je omogućiti svim učesnicima da razmenjuju zaštićene i autentifikovane podatke, pristupaju, koriste i prijavljuju se na najnovije dokumente o standardnim trgovinskim standardima i iskoriste inteligenciju industrije putem svojih svakodnevnih alata (TMS i drugog softvera).

Softverska rešenja su uglavnom namenjena preduzećima čija je delatnost drumski transport robe, ali i preduzećima koja posreduju u pružanju ovih usluga. Kreirani su kao modularna aplikacija gde svaki modul predstavlja posebnu celinu koja je integrisana sa ostatkom softvera i drugim modulima. Sastavni deo ovih softverskih rešenja je vrlo često i baza podataka koja je jedinstvena za sve module. Trenutno su u funkciji moduli NCTS i GMS (Marčetić, 2021a).

TMS (*Transportation Management Systems)* softverski paketi zaslužuju najveću pažnju. TMS su u fokusu kao pojačivači globalne trgovine i logistike. Prema Gartner izveštaju globalno TMS tržište raste po stopi od 11,1% godišnje i dostići će vrednost od $1,94 milijarde do 2022 (www.gartner.com). Većina TMS sistema podržava samo drumski transport dok neki podržavaju i multimodalni transport. Multimodalni transport se odnosi na prevoz tereta po jednom ugovoru

sa jedinim prevoznikom, koji uključuje više od jednog prevoznog sredstva. Prevoznik, označen kao multimodalni prevoznik (MTO), pravno je odgovoran za celokupnu pošiljku; iako se često angažuju „stvarni prevoznici" koji prevoze teret (Kilibarda, 2020).

Jedan od najrasprostranjenijih TMS programa je ***Logistik TMS*** (www.logistic.com) koji omogućava da se na efikasan način svi podaci vezani za transport robe evidentiraju, čuvaju, organizuju, a što je važnije, kasnije lako koriste i analiziraju prilikom odlučivanja. Izrada naloga za transport robe u Logistik TMS-u, ne svodi se na puki administrativni posao. Svaki podatak koji u nalog unosite ima jasno određeno mesto i relaciju sa ostalim podacima. To omogućava kvalitetnu kontrolu izvršavanja zadataka sa naloga i kasnije detaljnu analizu obavljenog posla. Kroz evidenciju transportne ture Logistik TMS omogućava da se na jednom mestu povežu i ukrste podaci iz više izvora. Logistik TMS se može proširivati i povezivati sa drugim servisima kao što su servisi sistema za praćenje vozila. Pored TMS rešenja korisnici mogu dodatno koristiti i rešenja za rad sa carinskom dokumentacijom-Logistik CM (Manager).

3. DIGITALNA STRATEGIJA FIATA

Nova digitalna strategija FIATA se za vreme pandemije uhvatila u koštac sa problemom digitalizacije (www.fiata.org). Cilj ove strategije je omogućiti njenim članovima da razmenjuju zaštićene i autentifikovane podatke, pristupaju, koriste i prijavljuju se na najnovije dokumente FIATA i iskoriste inteligenciju industrije putem svojih svakodnevnih alata (TMS i drugog softvera) (www.searcherp.techtarget.com).

Strategija se fokusira na četiri glavne ose:

1. Stvaranje mreže poverenja: definisanje formata digitalnog identiteta i registra, koji će omogućiti špediterima da razmenjuju autentične i zaštićene podatke.
2. Primena standarda:
   - omogućavanje dostupnosti šablona digitalnih standarda FIATA putem TMS i drugih relevantnih logističkih platformi, na kontrolisan način;
   - omogućavanje špediterima da digitalno potpišu dokumente kako bi njihovi partneri mogli lako identifikovati izdavaoca dokumenta.
3. Olakšavanje interoperabilnosti: povezivanje postojećih softverskih platformi kroz definisanje modela razmene podataka;
4. Promovisanje poslovne inteligencije: osiguravajući članovima FIATA da zadrže kontrolu nad svojim podacima i da mogu lako prikupljati i analizirati podatke od dobavljača softvera radi optimizacije poslovanja.

Ukratko za uspešno implementiranje zadate strategije neophodno je da se sprovedu nekoliko elemenata, a to su, digitalni identitet, digitalna biblioteka sa standardizovanim dokumentima, digitalni sertifikat, digitalni potpis, interoperabilnost. Okosnice ove strategije su poslovna mreža i poslovna inteligencija kroz sprovedenu analitiku dobijenu od prikupljenih podataka (Marčetić, 2021a).

Čini se da je multimodalni transport danas najbolje rešenje za složene poduhvate realizovanja međunarodnog transporta (Zelenika, 2001), pa i uspešne digitalizacije. FIATA je stvorila sopstveni standard za multimodalni transport pre više od 50 godina - tovarni list FIATA (FBL). Put ka standardizaciji i izdavanje elektronskog teretnog lista eBL je otvoren prvi put u decembru 2020. godine objavljivanjem podataka Udruženja za otpremu digitalnih kontejnera (DCSA), što

je prvi korak za objedinjavanje komunikacije između svih strana uključenih u transakciju, sa ciljem potpunog usvajanja *eBL* (Gokcay , 2021). Prednosti ovog elektronskog dokumenta su višestruke, ali treba da postoje neki bazični uslovi koji moraju da se ispune da bi elektronska dokumenta našla svoju primenu (Malfliet, 2017).

4. INICIJATIVE ZA UMREŽAVANJE INFORMACIONIH LOGISTIČKIH PLATFORMI

U poslednjih nekoliko godina razvijene su različite inicijative kako bi se olakšala međusobna povezanost postojećih sistema, omogućavajući akterima lanca snabdevanja da razmenjuju informacije, a da pritom zadrže kontrolu nad svojim. Sve inicijative kao što su *IATA One Record, FEDeRATED, FENIKS* ili *IPCSA NoTNIata* ONE Record (www.iata.org, 2022; https://fenix-network.eu/; https://ipcsa.international/pcs/pcs-general/) su standardi za podelu podataka i jedinstveni prikaz pošiljke. Ovaj standard defimiše zajednički model za podatke koji se dele preko standardizovane i osigurane mreže. Cilj *ONE Recorda* je uhvatiti se u koštac sa izazovima digitalne špedicije i otvoriti nove mogućnosti ka punoj digitalizaciji vazdušne kargo industrije i samim tim dodati novu vrednost postojećim poslovnim modelima. *One Record* pokriva ceo transportni lanac. Podatke deli vlasnik podataka koji ima potpunu kontrolu nad njima. Podaci ostaju na izvoru i vlasnik dozvoljava ili onemogučuje pristup. Svaka strana može deliti datum isporuke relevantnim strankama, poboljšavajući transparentnost na taj način. *One Record* omogućava svim zainteresovanim stranama da se povežu preko API (application programming interface). Api je softver koji omogućava aplikacijama da komuniciraju međusobno. Ovo će dalje voditi ka novim kooperativnim IT rešenjima i inovacijama. *One record* postaje digitalna baza za avioprevoznike, njihove provajdere gde će moći da razviju kolabrativne i automatizovane onlajn usluge. Ova tehnološka platforma je spremna za novu generaciju digitalnih nomada koji će voditi transportnu industriju. Početni signal da je vazdušna kargo industrija spremna za digitalizaciju je frekventno korišćenje e-AWB u 3 od 4 isporuke. Ovo je bio signal da treba ići dalje od EDI razmene podataka.

FENIX Federation (https://fenix-network.eu/) (A European Federated Network of Information eXchange in LogistiX) je prva evropska federativna informaciona arhitektura za razmenu podataka za logističku zajednicu koja osigurava inteporabilnost između individualnih biznisa. Omogućava razmenu podataka na nivoima Business to Administration (B2A), Business to Business (B2B) od strane transportnih i logističkih operatera. Platforma je je osigurani okvir za razmenu podataka u formi federacije, gde nijedan subjekt ne poseduje ovaj mrežni ekosistem i gde i gde svaki učesnik ima ista prava i dužnosti u upravljanju federacijom. Glavni cilj FENIXA je da napravi interkonekciju raznih digitalnih platformi i da harmonizuje njihov uslugu na bazi interporabilnosti i zajedničkih protokola kod deljenja podataka. Deljenje podataka u formi digitalnog koridora oplužuje evropsku logističku zajednicu. Prednosti ove platforme su to što nije centralizovana i tehnološki neutralna.

IPSA (https://ipcsa.international/pcs/pcs-general) internacionalna platforma igra vitalnu ulogu u olakšanju pomorskog i vazdušnog transporta. Ova platforma za razmenu podataka omogućava brzi prenos informacija na nivou B2B, B2G i G2G. Ona podržava efikasno izvršenje logističkih operacija u stotinama vazdušnih i morskih luka povezujući tok operativnih i administrativnih procesa i uklanjajući papir iz lanca snabdevanja. IPSA isporučuje razne usluge kroz sistem jedinstvenog prozora: brza i efikasna EDI razmena podataka, carinske deklaracije, status kontejnera kroz ceo logistički lanac, obrada opasne robe, statistički podaci, i dr.

5. UPRAVA CARINA U PROCESU DIGITALIZACIJE

Carinskim zakonom postignut je izuzetno visok nivo usaglašenosti sa Carinskim zakonom EU u oblasti komunikacije između carine i privatnog sektora, koja će se ubuduće obavljati elektronskim putem. Najveći stepen automatizacije zasnovan na elektronskoj deklaraciji postignut je u carinskom postupku tranzita. NCTS je kompjuterizovani tranzitni sistem rasprostranjen u Evropi koji je zasnovan na elektronskoj deklaraciji i obradi podataka, predviđen da obezbedi bolje upravljanje i kontrolu zajedničkog tranzita i tranzita unutar zajednice. Ovaj sistem koristi aplikacije za razmenu poruka između carniskog i privrednog subjekta. To je sistem elektronske deklaracije i prerade koji omogućava trgovcima da podnesu tranzitne deklaracije elektronskim putem.

Nacionala uprava svake zemlje treba da razvije sopstvenu NCTS strukturu, u skladu sa arhitekturom definisanom u centrali, koja će biti povezana sa svim drugim zemljama preko centralnog domena u Briselu. Zasnovan na korišćenju naprednog kompjuterskog sistema i elektronskoj obradi podataka, on garantuje modernije i efikasnije upravljanje od papirne dokumentacije sa svojim dokazanim nedostacima. Uvođenjem NCTS-a, elektronski zapis podataka postaje jedini pravno ispravni dokaz za razliku od dosadašnjeg sistema gde je to bila papirna deklaracija.

6. ZAKLJUČAK

Jedan od problema digitalizacije u špediterskoj branši je veliki jaz između stepena digitalizacije velikih i malih preduzeća. Velike transportne i logističke firme su prešle na digitalni mod veoma uspešno, dok se male firme muče sa finansijama za nabavku softvera (Nugraho,2018). Interoperabilnost, nedoslednost u standardima podataka predstavlja drugi problem i veliki izazov za špeditersku industriju uopšte, a i za funkcionisanje korisničkih platformi. Svako špediterско preduzeće ima poteškoća u razmeni podataka sa svojim komintetima jer svako često koristi drugačiji sistem i drugačiju semantiku za razmenu podataka. Nova FIATA digitalna strategija bi trebalo da se uhvati u koštac sa ovim problemom omogućujući špediterima da lako razmenjuju podatke uspostavljajući bezbedno poslovno okruženje. Cilj je omogućiti svim učesnicima da razmenjuju zaštićene i autentifikovane podatke, pristupaju, koriste i prijavljuju se na najnovije dokumente o standardnim trgovinskim standardima i iskoriste inteligenciju industrije putem svojih svakodnevnih alata (TMS i drugog softvera). U poslednjih nekoliko godina razvijene su različite platforme kako bi se omogućilo akterima da razmenjuju informacije međusobno, a da pritom zadrže kontrolu nad svojim. Sve platforme za umrežavanje kao što su *IATA One Record, FEDeRATED, FENIKS* ili *IPCSA NoTN* imaju za cilj stvaranje sistema za razmenu podataka uz veću vidljivost i transparentnost. Otpremnici, prevoznici i špediteri proizvode sve više podataka, uz potrebu za njihovom razmenom. Sve ove inicijative zajedno sa komjuterizovanim carinskim sistemima nedvosmisleno ukazuju na skoru budućnost digitalnog integrisanog logističkog lanca.

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Uticaj pandemije COVID-19 na razvoj online tržišta u Republici Slovačkoj

The Impact of the COVID-19 Pandemic on the Development of the Online Market in the Slovak Republic

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Saţetak: *Svet kakav smo poznavali pre marta 2020. godine, odnosno pre izbijanja pandemije COVID–19, se promenio u svim segmentima našeg društva. Ono što smo pre same pandemije smatrali sasvim normalnim i jedinim ispravnim veoma brzo se pokazalo da nije sasvim tačno. Veoma je bitno istaći da je pandemija promenila mnogo pravila u svetu, a ujedno i sferu marketinga kao i celokupno online tržište u Slovačkoj. Ovo je bio i glavni impuls za pisanje rada na temu „Uticaj pandemije COVID–19 na razvoj online tržišta u republici Slovačkoj". Namera je doprinos razvoju ove aktuelne teme na prostorima jugoistočne Evrope. U radu će prvenstveno biti obuhvaćena analiza aktuelnog stanja i izazova sa kojima se susreće ova oblast, kao i mogućnosti, odnosno potreba da podignemo celo online tržište u Slovačkoj na jedan viši nivo. Glavni cilj je prikaz da je uticaj pandemije COVID–19, odnosno krize koja je nastala u celom svetu, bilo moguće prevazići uspešnim prilagođavanjem tržišta pravilima poslovanja. Ostaje nada da će nakon sumiranja zaključaka i preporuka ovaj rad biti podsticaj u daljem razvoju ove teme.*

Abstract: *The world as we knew it before March 2020, that is, before the outbreak of the COVID-19 pandemic, changed in all segments of our society. What we thought was completely normal before the outbreak of the pandemic, and the only right thing quickly turned out to be not quite true. It is very important to point out that the COVID-19 pandemic has changed many rules in the world, as well as the marketing segment and the entire online market in Slovakia. This was the main reason for writing an article on „The impact of the COVID-19 pandemic on the development of the online market in the Slovak Republic". The intention is to contribute to the development of this topic in Southeast Europe. The article will primarily include an analysis of the current state and challenges that this area is facing, as well as the opportunities and the need to raise the entire online market in Slovakia to a higher level. The main goal of this article is to show that the impact of the COVID-19 pandemic, i.e. the worldwide crisis, could be overcome by successful adaptation of the market to the business rules during the crisis. Hope is that after summarizing conclusions and recommendations, this paper will be an impetus for the further development of this topic.*

1. UVOD

Medijski prostor (tradicionalni mediji) je deo našeg svakodnevnog života. Pored medijskog prostora, možemo uzeti u obzir i kulturni prostor koji predstavlja društveni prostor i sajber prostor koji uključuje nove digitalne i mobilne medije kao što su platforme i virtuelni prostor. Svi ovi prostori određuju sa kojim informacijama se susrećemo, kako ih dalje možemo širiti, čuvati i koristiti. S jedne strane, medijski prostor određuje kako će se informacije distribuirati pojedincima i kako ih oni mogu dekodirati, a sa druge strane to je vrsta društvenog i kulturnog prostora koji predstavlja neku vrstu virtuelne kapije koja dopušta pojedincima da uđu i dodirnu informacije (Šoltésová, 2016).

Medijsko tržište u Slovačkoj je pretrpelo ogroman pad oglašavanja na samom početku pandemije COVID -19 u martu 2020. godine. Ubrzo nakon što je vlada Slovačke donela odluku o meri zaključavanja ili bolje rečeno o LockDown-u, nastaje velika nesigurnost na online tržištu. Online poslovanje se promenilo, većina klijenata smanjuje reklamne budžete, a samim tim i komunikaciju odnosno oglašavanje.

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Alexej Fulmek, predsednik upravnog odbora Asocijacije štampanih i digitalnih medija i generalni direktor Petit Pressa, rekao je za ekonomski časopis Trend da je koronavirus značajno promenio medijsko poslovanje odmah nakon uvođenja LockDown-a u Slovačkoj. Očekivanja koja su imali u Asocijaciji štampanih i digitalnih medija na početku pandemije su bila da će doći do pada oglašavanja u iznosu od oko 50%, a u najgorem mogućem scenariju se očekivao pad oglašavanja od oko 70% (Fulmek, 2020).

Ova predviđanja predsednika upravnog odbora Asocijacije štampanih i digitalnih medija se na sreću nisu obistinila. U prvoj polovini 2020. godine se desio značajan pad online oglašavanja. Međutim, druga polovina 2020. godine je bila je mnogo bolja, što se tiče celog online tržišta i desio se rast od 2,4%, što je ukupno iznosilo 140 miliona evra (IAB Slovakia, 2021).

Prva godina pandemije COVID -19 je bila jako zahtevna i puna izazova, što se tiče zaposlenih na poziciji marketing stručnjaka. Sa jedne strane je bio veliki pritisak kompanija da se prekine svaka komunikacija odnosno ulaganje u oglašavanje. Sa druge strane su marketinški stručnjaci bili primorani da pronađu najefikasniji način, odnosno kanal komunikacije da bi same kompanije uspele da opstanu sa minimalnim gubicima na tržištu.

2. CILJ ISTRAŽIVANJA

Glavna svrha ovog istraživanja jeste da prikaže da postoji mogućnost razvoja tržišta i u situaciji kada je ceo svet paralizovan pandemijom COVID -19. Ovaj članak je napisan sa vrlo jasnom namerom da se doprinese razvoju ove teme na prostoru jugoistočne Evrope. Da bi ovakav cilj bio postignut, moramo objasniti pojmove, prikazati mogućnosti uspešnih primera iz prakse na tržištu Slovačke, predstaviti rešenja i dati preporuke za dalji razvoj tržišta.

Istraživački cilj rada je analiza trenutnog stanja na tržištu i analiza elemanata koji utiču na ukupno online tržište u Slovačkoj. Takođe, cilj ovog članka je analiza prepreka, potreba i eventualnih prilika koje nam se pružaju iz ove oblasti brzim odgovorom i prilagođavanjem na potrebe tržišta u pandemijskoj situaciji koja je zadesila ceo svet.

Nadamo se da će ovakva analiza da bude temelj i inspiracija novim strategijama koje će biti primenjene a kasnije i implementirane u praksi. Nakon sumiranja zaključaka i preporuka, verujemo da će ovaj rad pomoći u podsticaju za dalji razvoj ove teme.

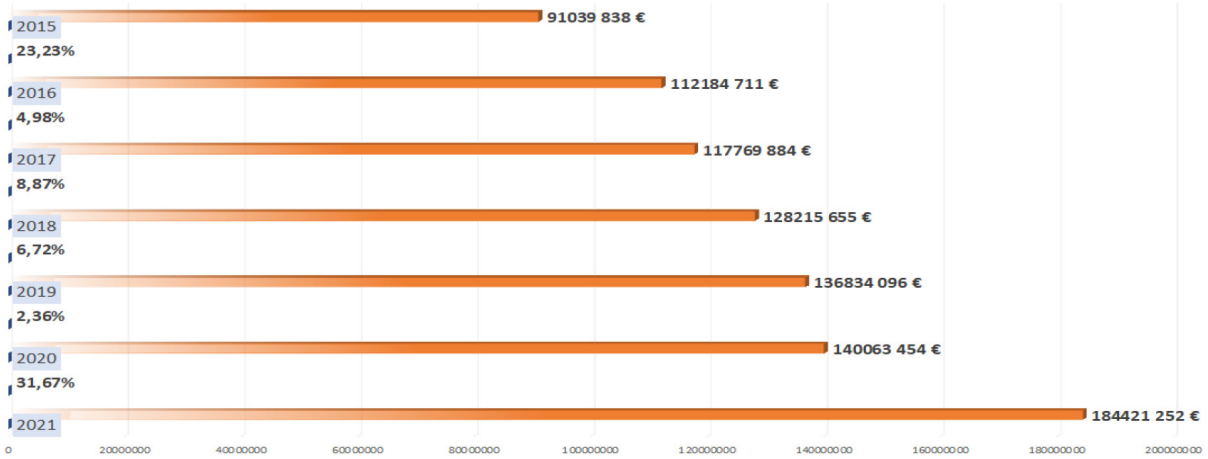
3. METODE I METODOLOGIJA

Za istraživanje u ovom članku korišćena je široka skala naučnih metoda i raznih procedura. U prvom delu je analizirano aktuelno stanje na tržištu od 2015 -2021, a podaci su dobijeni iz kompanije IAB Slovakia (2022). Takođe su analizirani statistički podaci koji su javno dostupni na oficijalnom sajtu finstat.sk (2022) koji je povezan sa poreskom upravom Slovačke, a takođe je analizirano i zajedničko istraživanje koje su sprovele kompanije KPMG i ui42 (2020).

Identifikacija istraživačkih pretpostavki je sažeta u metodologiji kao i izvori i metode koji su korišćeni u radu. Rezultati su deo glavne analize koji su dobijeni pomoću komparativne i deskriptivne analize. Sve ovo je rezultiralo listom preporuka koja se može iskoristiti u budućim istraživanjima u razvoju aktualne teme.

4. TEORIJSKA OSNOVA

Na Slovačkom medijalnom tržištu posluju specijalizovane reklamne agencije, marketinške agencije i agencije kojima je specijalnost „branding". Medijsko tržište u Slovačkoj se može definisati kao skup svih aktuelnih i potencijalnih kupaca koji kupuju određene proizvode i usluge. Industrija je grupa kompanija koje nude proizvod ili klasu proizvoda koji su bliske zamene. To je skup svih prodajnih proizvoda i usluga (KOTLER, 2004). Online tržište u Slovačkoj za poslednjih nekoliko godina beleži rast, što baš i nije srazmerno situaciji u kojoj se nalaze specijalizovane reklamne agencije na tržištu.



Slika 1. Online tržište u Slovačkoj od 2015 – 2021. godine rast u %
Izvor: IAB Slovakia, 2021

Na slici 1 vidimo međugodišnji rast od 2015. godine sve do 2020. i 2021. koje su bile pandemijske godine. Najmanji međugodišnji rast je bio 2020. godine i to zbog već dobro poznatih razloga. Kao što je gore navedeno, u prvoj polovini 2020. godine je nastao veliki pad oglašavanja. Na kraju godine ipak tržište beleži rast cca 2,4%, a to samo zahvaljujući brzoj reakciji marketera koji su se prilagodili trenutnoj situaciji.

Većina marketinških agencija u Slovačkoj za poslednjih nekoliko godina, tačnije do 2020. godine su imale problem sa negativnim trendom odnosno smanjivanjem prihoda iz godine u godinu. Jedan od razloga, jeste taj što klijenti sve više koriste društvene mreže kao kanal za oglašavanje. Najčešće se koriste usluge kompanija Facebook, Instagram i YouTube, u okviru mediamixa. Budžeti klijenata se svake godine povećavaju na ovim društvenim mrežama, što dovodi do nekoliko problema koji su počeli da se pojavljuju na tržištu. Na primer ni jedna od ovih kompanija nema sedište firme u Slovačkoj, a to znači da porez na dodatnu vrednost (PDV) plaćaju u nekim drugim državama. Ova činjenica dodatno utiče na dobit marketinških agencija, a što se više koristi oglašavanje na društvenim mrežama, to su Slovačke marketinške agencije više uskraćene za maržu.

Marketinške agencije koje smo uporedili slove za najveće agencije na tržištu, što možemo videti i po podacima koje smo analizirali. Period koji smo analizirali jeste od 2015 – 2021. godine. Razlog zašto smo izabrali ovaj period jeste da su 2015. godine nastale poslednje velike promene u vlasničkim strukturama marketinških agencija u Slovačkoj. Poslednja osnovana agencija iz TOP 8 jeste Media and Digital Services, s.r.o. (Obchodný register na internete, 2021).

Tabela 1. Prihodi marketinških agencija od 2015 – 2021. godine u milionima €

Marketinške agencije	Prihodi u mil. €						
	2015	2016	2017	2018	2019	2020	2021
Unimedia, s.r.o.	56,4	50,2	56,5	58,2	62,8	59,2	57,1
ZenithOptimedia, s.r.o.	27,2	21,6	19,4	17,5	24,1	23,2	28,6
Wavemaker Slovakia, s.r.o.	27,6	28,7	25,6	23	25,2	24,6	26,4
Universal McCann, s.r.o.	24,2	25,2	24,5	21,1	19,8	17,5	
MediaCom, s.r.o.	17,6	19,8	19,3	25,2	20,6	19,3	24,7
Media and Digital Services, s.r.o.	21,4	12,7	18,9	19,2	21	20,9	23,5
StarMedia, s.r.o.	16,7	15,8	14,3	15,5	11,7	8,3	11,2

Izvor: Finstat.sk, 2022

Kao što se može i videti iz priloženog, najveća marketinška agencija u Slovačkoj jeste Unimedia, s.r.o. i u ovom periodu su njeni godišnji prihodi bili veći od 50 miliona evra. Iza Unimedie slede ZenithOptimedia i Wavemaker Slovakia sa prihodima prosečno većim od 20 miliona evra. Ostale agencije su manje po prihodima.

5. PRIMER

5.1. Uticaj COVID- 19 na e-commerce u Slovačkoj

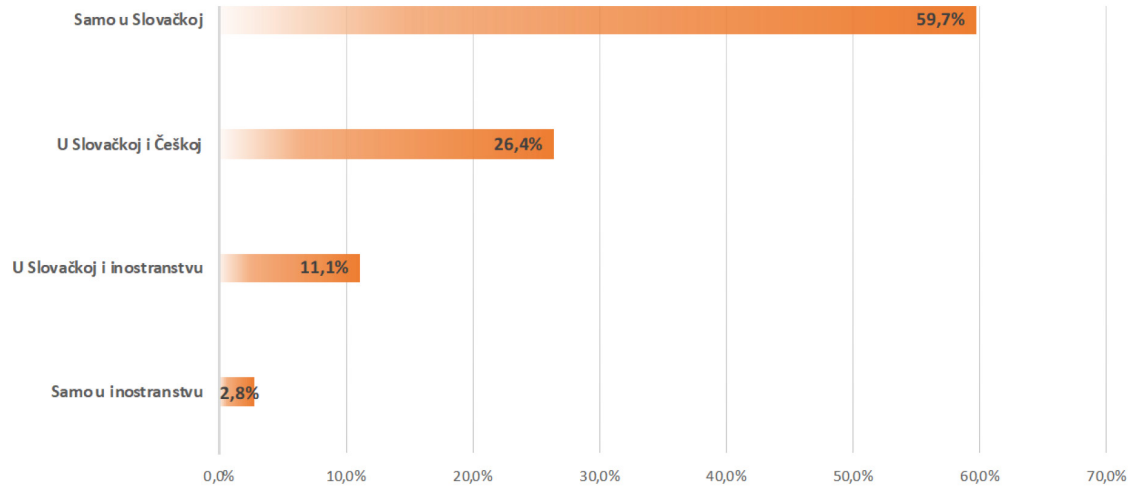
Istraživanje uticaja COVID -19 na e-commerce u Slovačkoj su realizovali kompanije KPMG i ui42 na osnovu on line upitnika u maju 2020. godine (KPMG, 2020).

Za vreme pandemije su prodavnice bile zatvorene zbog LockDown-a i raznih mera koje su donosile vlade širom planete. Sa druge strane internet prodavnice su mogle da funkcionišu nesmetano bez ikakvih ograničenja. Najveći problem za vlasnike internet prodavnica u Slovačkoj, na samom početku pandemije su bili logistika i prekid snabdevanja od strane dostavljača. U ovom periodu, potrošači su promenili svoje navike, a veći udeo je imala kupovina preko interneta. Međutim, podaci iz ovog istraživanja su pokazali da je rast prodaje zabeležilo samo 4 od 10 Internet prodavnica u Slovačkoj. Veoma interesantan podatak jeste, da u slučaju rasta to je bilo između 16 – 30 %. Kada govorimo o padu prodaje, firme su beležile gubitke koji su bili veći od 30 %. Najčešći problemi koji su se pojavili su bili kašnjenje isporuka prema klijentima. Na osnovu ovog istraživanja smo dobili podatke da je skoro 80 % ispitanika reklo da su imali kašnjenje u isporuci paketa, u proseku od jednog do šest dana.

Ono što nam takođe proizilazi iz ovog istraživanja jeste da su dve trećine internet prodavnica povećale svoje investicije za razvoj online-a tokom pandemije. Još jedna činjenica jeste veoma zanimljiva da je skoro jedna trećina e-commerce kompanija uvela na tržište nove proizvode ili usluge.

Približno 30% ispitanika koji su bili učesnici ovog istraživanja je potvrdilo da su tokom pandemije u svojoj Internet prodavnici ponudili kupcima popuste i rasprodaju. Proizvodi koji su se najviše prodavali u ovom periodu su bile hirurške maske koje su služile za zaštitu zdravlja i razni vitamini za poboljšanje imuniteta.

Slovačka je pristupila raznim merama koje su trebale da pomognu preduzetnicima tokom krize. Čak 50% ispitanika nije znalo da odgovori da li su te mere bile dovoljne ili nisu.



Slika 2. U kojim državama posluje vaša internet prodavnica
Izvor: KPMG, 2022

Iz slike 2 vidimo da skoro 60% učesnika u ovom istraživanju su bile firme koje posluju u Republici Slovačkoj. 26% su firme koje imaju svoje poslovanje u Slovačkoj i Češkoj, dok 11,1% posluje u Slovačkoj i inostranstvu. Najmanja grupa firmi ima Internet prodavnice koje posluju samo u inostranstvu.

6. ZAKLJUČAK I PREPORUKE

Cilj ovog članka je bio da se sagleda trenutno stanje na online tržištu u Slovačkoj. Ukupno medijsko tržište u Slovačkoj utiče na online tržište, takođe pandemija Covid - 19 je u značajnoj meri uticala na razvoj online tržišta u Slovačkoj.

Prilikom ovog istraživanja i analizom podataka iz dostupnih istraživanja dolazi se do zaključka da se online tržište nije ponašalo u skladu sa očekivanjima, da će doći do velikog pada u prihodima. U ukupnom zbiru je zabeležen rast online tržišta u 2020. godini približno 2,4%, a u drugoj pandemijskoj godini 2021. rast je bio na nivou 31,7%, što je najveći rast u godinama koje su analizirane.

Kao što možemo i videti iz istraživanja koje su sproveli zajedno KPMG i agencija ui42, da pomoć države nije bila adekvatna i pravovremena, s obzirom da je na snazi bila vanredna situacija u državi. Najveći problem koji je nastao u poslovanju za vreme pandemije COVID – 19, je evidentno bio taj da su isporuke kasnile do 6 dana, što je za internet prodavnice ključni problem. Većina ljudi je bila primorana da počne da kupuje bez odlaska u prodavnice, što znači da su kupci u Slovačkoj počeli masovno da koriste kupovinu na internetu.

Na osnovu analize, preporučujemo nekoliko ključnih koraka koji su bitni za dalji razvoj online tržišta u Slovačkoj. Vlada republike Slovačke bi trebala više da komunicira sa malim i srednjim preduzetnicima, da im pravovremeno pomogne finansijski ili u vidu raznih poreskih olakšica koje bi još više pokrenule celo online tržište. Na ovom polju nisu dovoljna samo obećanja.

Jedna od najbitnijih preporuka jeste da e-commerce u Slovačkoj, treba više da se fokusira na komunikaciju na lokalnim web sajtovima i lokalnim televizijama. Takođe, u ovoj i narednim godinama treba razvijati e-commerce, kao što je to bilo u slučaju 2021. godine. Kupci su stekli

naviku da kupuju u online prodavnicama i treba to iskoristiti u daljem razvoju e-commerce, na polju sigurnosti i bezbednosti kupovine na internetu.

Javne ličnosti mogu veoma da pomognu u razvoju online tržišta, pošto većina ljudi se ugleda na javne ličnosti i većinom one služe kao inspiracija u društvu posebno mlađoj populaciji. Ako bi bile pokrenute kampanje u kojima bi učestvovale javne ličnosti, gde edukuju starije sugrađane o bezbednosti i načinu kupovine preko internet prodavnica to bi doprinelo i značajnom uspehu a verujemo i rastu celog online tržišta. Bezbednost svih korisnika na internetu treba da bude naš zajednički cilj.

Nadamo se da će ovaj članak da posluži kao inspiracija u kreiranju novih strategija, planova i naravno da služi kao podsticaj u budućem razvoju ove teme.

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Efikasnost europskog visokog obrazovanja u ostvarivanju ciljeva održivog razvoja

Efficiency Analysis of European Higher Education in Achieving Sustainable Development Goals

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Ciljevi održivog razvoja

Keywords:
Higher education;
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Data constraint analysis;
DEA;
Sustainable development goals

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Saželak: *Cilj ovog istraživanja je procijeniti tehničku efikasnost visokog obrazovanja zemalja članica EU u postizanju Ciljeva održivog razvoja. Mjerenje koeficijenta tehničke učinkovitosti daje više informacija o mjeri u kojoj se inputi koriste za proizvodnju izlaznih rezultata. Kako bi se odredili koeficijenti tehničke učinkovitosti koristi se analiza omeđivanja podataka (Data Envelopment Analysis). Koristimo tri inputa i tri outputa u procjeni tehničke efikasnosti. Inputi korišteni u ovom istraživanju su ukupan broj studenata, broj akademskog osoblja i javni izdaci na visoko obrazovanje, dok su outputi broj diplomiranih, stope zaposlenosti nedavno diplomiranih studenata i ukupna ocjena zemlje članice EU u Ciljevima održivog razvoja. Procjena koeficijenata tehničke učinkovitosti pomoći će nam u određivanju koja država najučinkovitije koristi svoje resurse u sektoru visokog obrazovanja. Također će istaknuti manje učinkovite zemlje i ukazati na načine za poboljšanje njihove učinkovitosti.*

Abstract: *This research aims to evaluate the technical efficiency of higher education in EU member states in achieving the Sustainable Development Goals. Measuring the coefficient of technical efficiency provides more information on the extent to which inputs are used to produce outputs. Data Envelopment Analysis is used to determine the coefficients of technical efficiency. We use three inputs and three outputs in the evaluation of technical efficiency. The inputs used in this research are the total number of students, the number of academic staff and public expenditure on higher education, while the outputs are the number of graduates, employment rates of recent graduates and the overall score of the EU member state in the Sustainable Development Goals. Assessing technical efficiency ratios will help us determine which state uses its resources most efficiently in the higher education sector. It will also highlight less efficient countries and point out ways to improve their efficiency.*

1. UVOD

Uposljednja dva desetljeća povećan je interes međunarodne zajednice i relevantnih dionika za uključivanje obrazovanja u globalnu političku inicijativu usmjerenu na održivi razvoj (UN, 2021). Visoko obrazovanje posebno se ističe svojim posebnim doprinosima u globalnom nastojanju postizanja ciljeva održivog razvoja.

Obzirom na navedeno, cilj ovog istraživanja je procijeniti tehničku učinkovitost visokog obrazovanja zemalja članica EU u postizanju Ciljeva održivog razvoja. Mjerenje koeficijenta tehničke efikasnosti daje više informacija o mjeri u kojoj se inputi koriste za proizvodnju outputa tj. rezultata. Kako bi se odredili koeficijenti tehničke učinkovitosti koristimo analizu omeđivanja podataka (eng. Data Envelopment Analysis ili DEA). Glavna prednost ove metode je da može koristiti višestruke inpute i outpute i pružiti informacije o smjeru promjena potrebnih za postizanje pune efikasnosti. U ovom se istraživanju koriste tri inputa i dva outputa vezana uz visoko obrazovanje u EU u 2028. godini. Inputi korišteni u ovom istraživanju odnose se na ukupan broj

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studenata u visokom školstvu (ISCED 5-8), broj akademskog osoblja i javne izdatke u visokom školstvu dok su outputi broj diplomiranih, stopa zaposlenosti nedavno diplomiranih studenata i ukupna ocjena zemlje članice Europske Unije u Ciljevima održivog razvoja.

Procjena koeficijenata tehničke učinkovitosti pomoći će nam u određivanju koja država najučinkovitije koristi svoje resurse u sektoru visokog obrazovanja. Također će istaknuti manje učinkovite zemlje i ukazati na načine za poboljšanje njihove učinkovitosti, odnosno kako mogu bolje iskoristiti svoje inpute u postizanju željenih rezultata.

2. PREGLED LITERATURE

U ovom pregledu literature usredotočit ćemo se na radove koji koriste Analizu omeđivanja podataka (eng. DEA) i primjenjuju je za procjenu efikasnosti u visokom školstvu. DEA se prvi puta pojavljuje 1978. godine, u radu Charnesa, Coopera i Rhodesa, a tek se kroz posljednjih 20-ak godina počinje primjenjivati za mjerenje efikasnosti u visokom školstvu. Kako istraživanja o (visokom) školstvu često imaju nekoliko inputa i outputa, DEA ih kombinira i daje koeficijente tehničke efikasnosti po odabranim modelima. Još jedna prednost metode je što se radi o neparametarskom linearnom programiranju u kojem se uspoređuje i rangira efikasnost jedne promatrane jedinice s obzirom na sve ostale jedinice i njihove ostvarene efikasnosti u analizi. Najefikasnija jedinica je ona koja koristi najmanju količinu inputa za proizvodnju što većeg outputa. Koeficijent efikasnosti se određuje u rasponu od 0 do 1 (ili 0% do 100%) pri čemu 1 (ili 100%) predstavlja najefikasniju jedinicu donošenja odluka u promatranom istraživanju.

Pregledom postojećih znanstvenih radova vidljivo je kako je DEA često korištena za istraživanje efikasnosti obrazovanja i obrazovnih institucija. Primjerice u Malešević Perović i Mihaljević Kosor (2020) provodi se istraživanje o efikasnosti europskih sveučilišta u postizanju Ciljeva održivog razvoja, kako bi otkrili koja su sveučilišta efikasna, a koja bi trebala bolje koristiti postojeće resurse. Istraživanje je provedeno na mikro i makro razini, odnosno na razini 25 europskih zemalja pri čemu je na makroekonomskoj razini odnosno na razini zemlje promatrana javna potrošnja u tercijarnom sektoru, dok je na mikroekonomskoj razini odnosno na razini sveučilišta promatrana efikasnost dostupnih resursa u postizanju što boljeg zadovoljavanja ciljeva održivog razvoja. S mikroekonomskog aspekta rezultati su pokazali kako je samo 16% zemalja efikasno, točnije - većina zemalja bi trebala težiti ispunjavanju većeg broja Ciljeva održivog razvoja.

Wolszczak-Derlacz (2017) u svom istraživanju analizira efikasnost sveučilišta u Europi i Americi pomoću analize omeđivanja podataka te dolazi do rezultata da su europska sveučilišta efikasnija. Wolszczak-Derlacz i Parteka (2011) istražuju efikasnost 259 europskih javnih tercijarnih institucija, pri čemu rezultati pokazuju kako broj žena u akademskom osoblju i veći izvori financiranja povećavaju efikasnost.

Nadalje, Agasisti (2011) provodi istraživanje o efikasnosti potrošnje na ustanove visokog obrazovanja u određenim Europskim zemljama koristeći DEA metodu. U analizi koristi četiri inputa (javne i privatne izdatke za ustanove visokog obrazovanja kao postotak GDP-a, broj upisanih studenata, odnos studenata i akademskog osoblja) i četiri outputa (postotak stanovništva koji je dostigao tercijarni stupanj obrazovanja, broj diplomiranih studenata kao postotak ukupnog stanovništva, stopa zaposlenosti i broj stranih studenata kao postotak od ukupnog broja studenata). Dolazi do rezultata da su razlike među zemljama jasno izražene.

Johnes and Johnes (2009) u svom istraživanju promatraju troškove i efikasnost engleskih sveučilišta koristeći panel metodu i analizu omeđivanja podataka. Za Portugal, Afonso i Santos (2008) provode istraživanje o efikasnosti javnih sveučilišta. Koriste se podaci za 52 visokoškolske institucije tijekom 2003. godine. Tercijarno obrazovanje u Portugalu obuhvaća sveučilišta čiji programi traju od 4 do 6 godina i politehničke institute čiji programi traju 3 godine. Inputi u analizi su prosječni izdaci po studentu i udio akademskog osoblja na 100 studenata, dok su outputi broj diplomiranih studenata na preddiplomskom studiju te broj doktorskih disertacija. Krajnji rezultati pokazuju da je ukupna efikasnost sveučilišta 0,67 odnosno promatrane institucije bi mogle postići jednake rezultate uz korištenje 33% manje količine inputa. Provođenjem analize koja je orijentirana prema output varijablama efikasnost se nalazi u rasponu od 0,77 do 0,83 odnosno postoji mogućnost boljeg iskorištavanja resursa za promatrane institucije, pri čemu bi 1 predstavljao potpunu efikasnost promatranih institucija.

Iz gore navedenih istraživanja razvidan je manjak analiza iz područja održivosti visokog obrazovanja. Sukladno s time, jako mali broj istraživanja koristi podatke vezane uz Ciljeve održivog razvoja. U sljedećoj cjelini predstavljamo model koji proširuje postojeća istraživanja iz ovog područja i usmjerava se na procjenu efikasnosti europskih visokoškolskih sustava u ostvarivanju Ciljeva održivog razvoja.

3. MODEL

U ovom radu koristimo analizu omeđivanja podataka pri čemu se efikasnost određuje u rasponu od 0 do 1 gdje 1 predstavlja najefikasniju jedinicu donošenja odluka u promatranom istraživanju. Kao i u prethodnim istraživanjima iz ovog područja koristi se tzv. Banker, Charnes i Cooper (1984) model ili BCC model, koji se zasniva na varijabilnim prinosima. Model se javlja 1984. godine i kod njega variranje inputa rezultira otprilike jednakim variranjem outputa. Kod mjerenja efikasnosti u ovome modelu, konačni izračun daje usporedbu jedinica slične veličine poslovanja, a granica efikasnosti je definirana kao konveksna krivulja (radi varijabilnih prinosa). Dodatna specifikacija u ovom istraživanju je orijentiranost na output tj. prikazuje koliko je moguće povećati output uz postojeće inpute. Ovaj model se češće primjenjuje od tzv. CCR modela autora Charnesa, Coopera i Rhoadesa (1978).

Koeficijent tehničke efikasnosti će u ovom radu odrediti koja zemlja najefikasnije koristi svoje resurse pri čemu su inputi broj studenata, broj akademskog osoblja u javni izdaci na visoko obrazovanje dok su outputi broj zaposlenih nakon studiranja, broj diplomiranih i ukupni rezultat postignutih ciljeva održivog razvoja. Također se navode i neefikasne jedinice te način za njihovo poboljšanje efikasnosti, odnosno na koji način mogu bolje koristiti svoje inpute u ostvarivanju Ciljeva održivog razvoja.

3.1. Podaci

U empirijskom dijelu koriste se podaci za zemlje Europske Unije u 2018. godini jer su posljednji dostupni podaci za javne izdatke za školstvo upravo za tu godinu. Odabrano je 27 zemalja EU (Ujedinjeno Kraljevstvo je isključeno zbog izlaska iz Unije) za koje će biti izračunati koeficijenti tehničke efikasnosti koristeći se DEA metodom. Nakon izračuna slijedi interpretacija podataka i daljnja analiza.

U analizi će biti korištena tri inputa i tri outputa (Tablica 1).

Tablica 1. Input i output varijable korištene u analizi

VRSTA	NAZIV	OPIS
Input 1	Broj studenata	Ukupan broj studenata upisan na jednu od razina studija (isced 5 – 8) u javnim institucijama za visoko obrazovanje u promatranoj godini
Input 2	Broj akademskog osoblja	Ukupan broj nastavnog i akademskog osoblja koji predaje u svim institucijama za visoko obrazovanje u promatranoj godini
Input 3	Javni izdaci za visoko obrazovanje	Javni izdaci na visoko obrazovanje (isced 5 – 8) u mil. eura
Output 1	Ukupna ocjena zemlje članice u ciljevima održivog razvoja	Ukupna ocjena zemlje članice u ciljevima održivog razvoja tzv. Overall score za svih 17 ciljeva održivog razvoja
Output 2	Zapošljivost	Broj zaposlenih ljudi koji su završili jednu od razina studija (isced 5 – 8) i imaju između 20 i 34 godine podijeljen sa ukupnim brojem ljudi koji su završili jednu od razina studija (isced 5 – 8) i imaju između 20 i 34 godine (u %)
Output 3	Diplomirani studenti	Broj studenata koji su uspješno završili obrazovanje u promatranoj godini

Izvor: izrada autora prema podacima s Eurostat-a

Podaci o inputima i outputima navedenih zemalja su preuzeti sa stranica Eurostata. Deskriptivna statistika je u Tablici 2.

Tablica 2. Deskriptivna statistika inputa i outputa

		Aritmetička sredina	Standardna devijacija	Minimum	Maksimum
Input 1	Broj studenata	648.223,81	839.498,78	7.043	3.127.927
Input 2	Broj akademskog osoblja	50.056,41	83.789,21	1.331	416.241
Input 3	Javni izdaci	5.959,95	9.718,61	161	42.651,8
Output 1	Ukupna ocjena zemlje članice u ciljevima održivog razvoja	79,40	3,44	73,15	85,53
Output 2	Zapošljivost	81,79	9,19	55,30	94,80
Output 3	Broj diplomiranih	147.954,22	196.745,94	1.847	742.656

Izvor: Izrada autora

Prosječan broj studenata u 2018. godini u 27 zemalja EU je iznosio 648.223,81, dok je minimalan broj studenata bio 7.043 (u Luksemburgu), a maksimalan 3.127.927 (u Njemačkoj). Nadalje, prosječan broj akademskog osoblja u 2018. godini iznosi 50.056, s minimumom od 1.331, a maksimumom od 416.241. Najveća ulaganja iz javnog sektora u tercijarno obrazovanje tijekom 2018. godine vidljiva su u Njemačkoj, Španjolskoj, Francuskoj, Italiji i Nizozemskoj, pri čemu je značajno primijetiti kako najveća ulaganja ima Njemačka od čak 42.651,8 milijuna eura. Najmanja ulaganja javnog sektora u tercijarno obrazovanje su vidljiva u Malti te iznose 161 milijun eura.

Prosječni rezultat postignutih Ciljeva održivog razvoja u 2018. godini iznosi 79,04%, pri čemu je minimalna razina 73,15% (u Bugarskoj), a maksimalna 85,53% (u Finskoj). Nadalje, prosječan broj zaposlenih nakon studiranja je u 2018. godini 81,79%, pri čemu je minimalan broj zaposlenih nakon studiranja 55,3%, a maksimalan 94,8%.

Najmanji broj zaposlenih nakon studiranja u 2018. godini ostvaren je u Grčkoj, dok je najveći broj zaposlenih nakon studiranja postignut na Malti. U 2018. godini prosječan broj diplomiranih studenata je iznosio 147.581, pri čemu je minimalan broj diplomiranih studenata 1.753 te maksimalan broj diplomiranih studenata 795.961. Najveći broj diplomiranih studenata postignut je u Francuskoj.

4. REZULTATI

Izračun koeficijenata tehničke efikasnosti uz korištenje BCC modela s varijabilnim prinosima na opseg i orijentacijom na output su prikazani u Tablici 3. Koeficijenti su u rasponu od 0 do 1, gdje 1 označava punu efikasnost.

Tablica 3. Koeficijenti tehničke efikasnosti za EU-27

Zemlja	Efikasnost	Rang	Zemlja	Efikasnost	Rang	Zemlja	Efikasnost	Rang
Belgija	0,97	23	Francuska	1,00	1	Nizozemska	1,00	1
Bugarska	1,00	1	Hrvatska	1,00	1	Austrija	0,99	21
Češka	1,00	1	Italija	0,94	26	Poljska	1,00	1
Danska	1,00	1	Cipar	1,00	18	Portugal	0,96	25
Njemačka	1,00	1	Latvija	1,00	1	Rumunjska	0,99	19
Estonija	1,00	1	Litva	0,97	22	Slovenija	1,00	1
Irska	1,00	1	Luksemburg	1,00	1	Slovačka	1,00	1
Grčka	0,92	27	Mađarska	0,99	20	Finska	1,00	1
Španjolska	0,97	24	Malta	1,00	1	Švedska	1,00	1

Izvor: Izrada autora

Analizom 27 zemalja članica u 2018. godini putem modela koji se temelji na varijabilnim prinosima (BCC) orijentiranog na outpute vidljivo je da odabrane zemlje imaju visoke koeficijente efikasnosti. Na granici efikasnosti nalazi se 17 zemalja. Naime sve te zemlje postižu punu efikasnost i koriste dostupne inpute na najbolji način kako bi postigle što veću razinu outputa. To su Bugarska, Češka, Danska, Njemačka, Estonija, Irska, Francuska, Hrvatska, Cipar, Latvija, Luksemburg, Malta, Nizozemska, Poljska, Slovenija, Slovačka, Finska i Švedska. Dodatno, blizu granice efikasnosti su Mađarska i Rumunjska s koeficijentom 0,99. Najnižu efikasnost ima Grčka i ona iznosi 0.92 te je prema rangu Grčka 27. zemlja po efikasnosti.

Obzirom se radi o modelu varijabilnih prinosa na opseg, cilj je maksimizirati outpute, a da inputi ostanu nepromijenjeni. Kod neefikasnih zemalja može se postići veći output uz postojeće inpute.

5. ZAKLJUČAK

Pregledom literature utvrdio se nedostatak istraživanja iz efikasnosti visokog obrazovanja u kojima se koriste Ciljevi održivog razvoja kao jedna od varijabli. Kao i u većini relevantnih istraživanja i u ovom radu se koristila DEA metoda koja mjeri tehničku efikasnost reprezentativnih jedinica (u ovom slučaju zemalja EU) dodjeljujući inputima i outputima pondere i rangirajući ih na temelju dobivenih rezultata. Preciznije, koristili smo tri inputa i tri outputa u procjeni efikasnosti uz dodatnu specifikaciju da se radi o BCC modelu s varijabilnim prinosima koji je usmjeren na outpute.

Istraživanje je pokazalo kako većina zemalja postiže relativno visoku efikasnost u ostvarivanju Ciljeva održivog razvoja. Sedamnaest zemalja ostvaruje punu efikasnost, među njima i Hrvatska, a najlošije rangirana je bila Grčka.

Rezultati se svakako trebaju interpretirati s oprezom jer DEA ima i neke nedostatke. Efikasnost se procjenjuje relativno, u odnosu na druge reprezentativne jedinice koje su u modelu. Također, ukoliko je izostavljen neki bitan input ili output, rezultati analize nisu precizni.

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Značaj fleksibilnog zapošljavanja za prostorno-funkcijske veze između naselja

The Importance of Flexible Employment for Spatial-Functional Links between Settlements

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Abstrakt: *U radu se razmatraju urbano-ruralne veze koje nastaju geografskim približavanjem mesta stanovanja i mesta rada (home-based business). Istraživanje je sprovedeno na uzorku od 310 preduzetnika koji posao obavljaju u kući, a lokacije ispitanika su prema udaljenosti od centralnog tržišta (Beograda) klasifikovane u tri zone: centar, periferiju i poluperiferiju. Veze između ove tri zone i njihovi prostorno-funkcijski odnosi istraženi su prostornom analizom razmeštaja njihovih glavnih izvora opreme i sirovina, sa jedne strane, i razmeštaja njihovih potrošača, sa druge strane. Rezultati su pokazali da se fleksibilizacijom lokacije rada uspostavljaju intenzivne veze između naselja, što implicira nove forme interakcije sela i grada i diverzifikaciju ruralne ekonomije.*

Abstract: *The paper discusses urban-rural connections that arise from the geographical approximation of place of residence and place of work (home-based business). The research was conducted on a sample of 310 entrepreneurs who work from home, and the locations of the respondents were classified according to the distance from the central market (Belgrade) into three zones: center, periphery and semi-periphery. The connections between these three zones and their spatial-functional relations were investigated by spatial analysis of the distribution of their main sources of equipment and raw materials, on the one hand, and the distribution of their consumers, on the other. The results showed that the flexibility of the location of work establishes intensive connections between settlements, which implies new forms of interaction between the village and the city and the diversification of the rural economy.*

1. UVOD

Opstanak i održiv razvoj ruralnih naselja temelji se na diverzifikaciji privrednih aktivnosti i smanjenju nezaposlenosti stanovništva, na promociji jednakih mogućnosti za sve, i na aktivnoj ulozi porodica i domaćinstva kao nosioca lokalnog razvoja. Opstanak i održivost se uglavnom povezuju sa problemima seoskih naselja, iako je očigledno da je u poslednjih nekoliko decenija doveden u pitanje i opstanak malih gradova u Srbiji. U seoskim naseljima razvoj zavisi prvenstveno od diverzifikacije postojećih privrednih aktivnosti i od podsticaja formiranju novih preduzeća, kojima se uspostavljaju nove urbano-ruralne veze, kidaju se stare, ili se jačaju neke postojeće. Višestruko korisna strategija za rast zaposlenosti i diverzifikaciju poslova jeste fleksibilizacija mesta rada, gde je rad u kući doživeo tokom poslednjih decenija brz porast u strukturi ukupne zaposlenosti. Rad u kući podrazumeva dve vrste poslova: a) obavljanje posla za poslodavca uz pomoć informaciono-komunikacione tehnologije, najćešće kao posao sa nepotpunim radnim vremenom i u formi podugovora; b) sopstveni biznis koji može biti namenjen pružanju visokospecijalizovanih profesionalnih usluga i proizvodnji roba i tradicionalnih usluga (poput ugostiteljstva, transporta i sl.). Rad u kući na mnoge načine redefiniše postojeće urbano-ruralne veze, a obrasci međuzavisnosti i upućenosti naselja jednih na druge, utiču na funkcionisanje svakodnevnog života stanovništva, posebno u ruralnom zaleđu (Jovanović Gavrilović, 2004).

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Preduzetničke aktivnosi kojima se mesto rada približava mestu stanovanja posebno su podsticajne za nastanak funkcionalnih relacija među naseljima. Tradicionalno, urbane regije se nameću kao tržište za proizvode i usluge ruralnog biznisa, a ruralne zajednice i mali gradovi, nude gradskom stanovništvu turističke destinacije i robe i usluge koje se u urbanim centrima ne proizvode. Netradicionalne veze selo-grad ostvaruju se zapošljavanjem ruralnog stanovništva u nepoljoprivrednim delatnostima gde urbana preduzeća na taj način šire svoju mrežu uticaja (Bogdanov 2007; Zakić i Stojanović 2011).

U ovom radu su u fokusu veze koje nastaju poslovnim aktivnostima od kuće, odnosno veze koje vlasnici biznisa ostvaruju sa svojim dobavljačima i kupcima. U radu su te veze analizirane prostornom distribucijom lokacija za snabdevanje i lokacija glavnih tržišta svih ispitanika. Cilj rada je da se utvrdi nivo zavisnosti od Beograda kao centralnog tržišta i osnovnog izvora snabdevanja opremom i sirovinama, a osnovna hipoteza u radu jeste da sa distancom od Beograda taj nivo zavisnosti opada. To dalje implicira da su lokaciono fleksibilni, nepoljoprivredni poslovi periferije više oslonjeni na lokalne mreže, zbog čega imaju šanse za opstanak i dalji razvoj.

2. TEORIJSKE OSNOVE RADA

Danas su za održiv razvoj naselja najvažnije funkcionalne urbano-ruralne veze utemeljene na principima integralnog i teritorijalnog pristupa unapređenju izvan-metropolitenskog prostora (Randal, 1997; Tošić, 2000). Kao što naglašava Malecki (1991) geografske razlike između centra i periferije ogledaju se u opsegu potencijalnih veza i brojnosti mogućih pristupa, uključujući pristup tržištu, uslugama, resursima, informacijama i tehnologijama. Tradicionalno, u međuodnosima sela i grada, urbani centar ima dominantnu ulogu koju nastoji da zadrži, dok je periferija visoko zavisna od centra. Na intenzitet ovih interakcija deluju tri glavna faktora: potrebe koje se ne mogu zadovoljiti bez drugih regija (Rondinelli, 1985), nejednaka distribucija moći (Preston, 1975) i nejednaka distribucija resursa i stanovništva. Osnovne vrste veza između sela i grada uključuju ekonomsku, socijalnu, institucionalnu, fizičku, ideološku i kulturnu dimenziju (Douglass, 1998; Unwin, 1989) a klasifikaciju veza na relaciji selo-grad ponudili su brojni autori počevši od Prestona (1975) koji je prvi dao adekvatnu tipologiju. Preston tako razlikuje pet mogućih vidova povezivanja: tokovi stanovništva, tokovi roba, kapitala, društvene veze i pružanje administrativnih i drugih usluga. Daglas (1998) daje sličnu tipologiju u koju uključuje tokove ljudi, proizvodnje, potrošnje, kapitala i dohotka i tokove informacija.

I u ključnim planerskim dokumentima EU, kao što je ESPON projekat, veze između sela i grada klasifikuju se u dve osnovne grupe: strukturne veze i funkcionalne veze (ESPON, 2008). Strukturne veze su stabilne, teško se menjaju i podrazumevaju način na koji je oblikovan fizički prostor. Najčešće se odnose na paterne izgrađenog i otvorenog prostora i uključuju društveno-ekonomsku diverzifikaciju (stanovanje, poljoprivreda, turizam) i međuzavisnost urbanih i ruralnih regija (dnevne migracije, rekreacija, korišćenje resursa). Za razliku od strukturnih, funkcionalne veze su više izraz komplementarnosti urbanog i ruralnog prostora a odnose se na tokove ljudi, roba i novca. Funkcionalne veze su fleksibilne i lako se prekidaju (ESPON, 2008).

Klasični idealni pogled na vezu selo-grad je simboza, gde su veliki urbani centri servisni centri ruralne periferije i tržište za ruralne proizvode, a sela izvor sirovog materijala, radne snage i kupci urbano utemeljene industrije (Berke, 2003). Ova komplementarna zajednica je danas narušena u mnogim zemljama gde stanovništvo kombinujući različite izvore prihoda, sa jedne strane podstiče nove integracije a sa druge ukida tradicionalne podele, stvarajući prostor za

difuziju mreža (INTERREG, 2009). U dokumentima evropske politike regionalnog planiranja, takođe se govori o tri tipa veza između sela i grada: proizvodne (sela su sirovinske baze za urbano utemeljenu prerađivačku industriju), potrošačke (najčešće su i odnose se na visoku zavisnost seoskog stanovništva od gotovih proizvoda) i finansijske veze (urbani rentijeri obradive zemlje, penzije migranata i štednja kanalisana urbanim institucijama). Finansijske veze, ako su ostvarene na lokalnom nivou, mogu mobilisati ekonomske šanse najsiromašnijih regiona ka uspostavljanju naprednijih, proizvodnih veza (ESPON, 2008).

Nova ekonomija je dovela do tranzicije od masovne proizvodnje ka fleksibilnoj proizvodnji i dominaciji uslužnog sektora (Harvey, 2000; Reuschke and Mason, 2020), a uslovila je i razvoj novih tehnologija, fleksibilan dizajn proizvoda, podugovaranje (Harvey, 2000), samozapošljavanje i rad u kući (Gibson-Graham, 1996). Rad u kući je kao nekapitalistička ekonomska forma reafirmisan krajem dvadesetog i početkom dvadeset prvog veka, sa razvojem postindustrijskog društva i fleksibilnih proizvodnih formi, a nastao je spajanjem dve dotada nespojive lokacije: kuće i posla (Felstead et al, 2005; Mason et al, 2008). Pink (2001) govori o ovom trendu kada kaže da reorganizacijom, dom prestaje da bude mesto na koje se sklanjamo od posla, već on postaje njegova centralna lokacija u kojoj zaposleni imaju kontrolu nad radnim vremenom ali ih prati i socijalna izolacija. Osim što podstiče veze u konkretnom prostoru, rad u kući je uz pomoć Interneta, mehanizama za transfer novca, unapređenih sistema isporuke i drugih tehnika povezivanja i komunikacije, stvorio veoma snažne društvene mreže (Pink, 2001; Institute for the Future/Intuit, 2007a; 2007b).

3. IZVORI PODATAKA I METOD

U ovom radu su korišćeni nepublikovani primarni podaci dobijeni anketnim istraživanjem na uzorku od 310 ispitanika, a koje je sprovedeno za potrebe doktorske disertacije o nepoljoprivrednoj ruralnoj ekonomiji u Srbiji (Gligorijević, 2012). Istraživanjem su obuhvaćeni ispitanici seoskih i gradskih naselja koji su obavljali bilo koju nepoljoprivrednu delatnost u okviru sopstvenog doma (kuća, dvorište, garaža i druge pomoćne prostorije), bez obzira da li su radili za poslodavca (rad od kuće) ili su posao sami pronašli (samozaposleni). Ispitivanje je obuhvatilo i poljoprivredne proizvođače ukoliko su primarne proizvode plasirali na tržište i ako su bili uključeni u neki vid prerade. Pri uzorkovanju je korišćen metod dvostruke stratifikacije: prema geografskim zonama (centar, poluperiferija i periferija), koje su definisane u zavisnosti od njihove udeljenosti od Beograda, i prema tipu naselja, odnosno da li su ruralna ili urbana naselja (Gligorijević i Devedžić, 2011). Saglasno ciljevima istraživanja u strukturi uzorka dominira ruralni prostor, tako da je u dvostruko stratifikovanom uzorku (lokacija i tip naselja), od 310 preduzetnika, na periferiji i poluperiferiji bilo locirano 264 ispitanika, a u selima njih 200. Pitanja su se odnosila na prirodu i obuhvat veza koje se obavljanjem posla od kuće ostvaruju sa drugim naseljima, a u ovom radu su upotrebljeni podaci o prostornoj distribuciji njihovih izvora snabdevanja i njihovih potrošača. Ti su podaci upotrebljeni da se prikažu razlike između centra, poluperiferija i periferije, odnosno da se prostornom i statističkom analizom ukaže na intenzitet i pravce veza koje nastaju obavljanjem posla sa različite lokacije, posebno posmatrano u odnosu na Beograd, kao grad sa najvećim funkcionalnim kapacitetom u Srbiji. Osim odnosa sa Beogradom, istraženi su tokovi robe i kapitala sa mrežom dobavljača i kupaca razmeštenih širom Srbije, ali i onih lociranih u inostranstvu. U radu je korišćena deskriptivna statistika (učestalost, srednja vrednost) i Hi-kvadrat test za istraživanje važnosti (značaja) razlika između regiona (centra, poluperiferije i periferije).

4. REZULTATI I DISKUSIJA

U tabelama 1 i 2 je prikazana oslonjenost periferije, poluperiferije i centra na Beograd, kao glavnog izvora snabdevanja i kao glavnog centra potrošnje roba i usluga koje nastaju poslovima i biznisom koji se obavlja od kuće.

Tabela 1. Beograd kao izvor sirovina i opreme

	Ukupno	**Region**		
% nabavke		**Centar**	**Poluperiferija**	**Periferija**
N	310	46	80	184
sig			1.00	
0.00	82.3	71.7	76.3	87.5
5.00	0.6		1.3	0.5
10.00	4.8	6.5	6.3	3.8
15.00	0.3			0.5
20.00	1.3		3.8	0.5
25.00	0.6		2.5	
30.00	0.3			0.5
35.00	0.3		1.3	
50.00	1.3		2.5	1.1
70.00	0.3			0.5
80.00	0.3		1.3	
90.00	0.3		1.3	
100.00	5.8	21.7	2.5	3.3
Nepoznato	1.3		1.3	1.6
Ukupno		100%		
N	306	46	79	181
Mean	08.5	22.4	08.5	05.0

Izvor: Obračun autora

U odnosu na periferiju, poluperiferija je više zavisna od glavnog urbanog centra (Beograda, tako da u strukturi inputa biznisa poluperiferije, Beograd u proseku učestvuje sa oko 8% (5% u periferiji). Isto kao što je zavisnost periferije od urbanog centra najmanja kada su inputi u pitanju, tako je najveći udeo robe i usluga ostvarenih kućnim biznisom periferije plasiran izvan Beograda. Samo 8% vlasnika kućnog biznisa na periferiji, svoju robu i usluge plasira u Beogradu. Pri tom, udeo robe i usluga plasiranih u Beogradu u ukupnom plasmanu ne prelazi 10% (tabela 2), što znači da najveći deo klijenata kućnog biznisa periferije čini lokalno stanovništvo. Okrenutost lokalnoj klijenteli smatra se od vitalnog značaja za opstanak biznisa i održivost ruralnih zajednica.

I poluperiferija je oslonjena na lokalno tržište, ali je mogućnost da isto izgubi na račun urbanog centra daleko veća nego što je u periferiji. Gubitak lokalnog tržišta za kućni biznis poluperiferije bi imao ozbiljne posledice, jer, za razliku od periferije, 20 % vlasnika kućnog biznisa poluperiferije je svoju klijentelu pronašlo u Beogradu. Iako u proseku na tržištu Beograda plasiraju svega 8,1% robe i usluga, taj je prosek značajno viši nego kada su u pitanju roba i usluge kućnog biznisa periferije koji u Beograd plasira u proseku oko 1,6% proizvoda. Iako nizak, prosečan udeo ruralnog biznisa čije se robe i usluge plasiraju na najveće tržište u Srbiji (oko 5%, periferija + poluperiferija) je značajan, posebno ako se ima u vidu da usluge čine 44% u ukupoj strukturi poslova. Ovi rezultati potkrepljuju stavove o postojanju netradicionalnih urbano-ruralnih relacija, gde urbani rezidenti postaju konzumenti *usluga* koje pruža ruralno zaleđe.

Tabela 2. Beograd kao tržište roba i usluga

	Ukupno	Region		
% potrošača/klijenata		**Centar**	**Poluperiferija**	**Periferija**
N	310	46	80	184
sig			1.00	
0.00	86.1	71.7	81.3	91.8
5.00	00.3			00.5
10.00	03.5	02.2	01.3	04.9
15.00	00.6	02.2		00.5
20.00	01.3		02.5	01.1
30.00	01.3	02.2	03.8	
40.00	01.0		03.8	
50.00	01.6		05.0	00.5
60.00	00.3	02.2		
75.00	00.3	02.2		
90.00	01.0	02.2	01.3	00.5
95.00	00.3	02.2		
100.00	02.3	13.0	01.3	
Ukupno		100%		
N	310	46	80	184
Mean	06.2	21.2	08.1	01.6

Izvor: Obračun autora

Rezultati prikazani u tabeli 1 i 2 sugerišu da je biznis poluperiferije jače povezan sa Beogradom, nego što je slučaj sa poslovima periferije. Može se kazati da je dostupnost najvećeg tržišta u Srbiji mogao biti glavni razlog pokretanja kućnih biznisa poluperiferije. Posebno je interesantno da se poslovima vezanim za preradu i trgovinu poljoprivrednim proizvodima, češće bavi stanovništvo koje je razmešteno u periurbanom pojasu (poluperiferija) nego u seoskim, tradicionalno agrarnim oblastima (periferija) u Srbiji (Gligorijević, 2012). Unapređenje saobraćajne infrastrukture i komunikacionih tehnologija uticali su da se u poluperiferiji, osim prehrambenih proizvoda, razviju slične usluge kao u centru (trgovina, informisanje i komunikacije, građevinarstvo), što je pojačalo mogućnost konkurencije biznisa između ova dva regiona (centra i poluperiferije). Za razliku od biznisa poluperiferije, biznis u ruralnom zaleđu je slabije povezan sa centralnim tržištem a kao glavni razlog otežanog snabdevanja opremom i plasmana gotovih proizvoda i usluga na tržište Beograda, smatra se trošak transporta.

Urbano-ruralne veze se ostvaruju ne samo nabavkom i plasmanom roba i usluga na relaciji selo-grad, već i na tradicionalno razvijenim grad-selo relacijama. Iz tabele 3 se zapaža se da se intenzivni kontakti ostvaruju trgovinom (nabavkom sirovina i prodajom proizvoda i usluga) sa ruralnim zaleđem. Gotovo jedna četvrtina vlasnika biznisa u centru, od 20-50% svoje robe i usluga plasira izvan Beograda, tačnije širom Srbije (tabela 3) a ta mogućnost integracije ruralnog i urbanog tržišta promoviše regionalni ekonomski razvoj, posebno razvoj mikro-regiona.

Osim urbano-ruralnih ekonomskih veza, rad u kući formira i ruralno-ruralne veze. Tako potrošači iz susednih ruralnih zajednica podržavaju opstanak biznisa u selima i malim gradovima Srbije. Veći je udeo vlasnika biznisa periferije (94,6%), u odnosu na poluperiferiju (82,5%) i centar (73,9%), koji svoje proizvode i usluge plasiraju kupcima koji su locirani u susednim zajednicama tj. istom okrugu (tabela 3). Takođe, veliki udeo vlasnika biznisa periferije (96,7%), sirovinama i opremom se snabdeva isključivo (100%) u drugim ruralnim zajednicama (tabela 3).

Tabela 3. Razmeštaj dobavljača i potrošača lociranih izvan Beograda (u %)

		Ukupno	Region		
	Col %		**Centar**	**Poluperiferija**	**Periferija**
	N=	310	46	80	184
Oprema i sirovine					
U istom okrugu gde živim i radim	0%	7.7	23.9	8.8	3.3
	Do 25%	1.0		3.8	
	25.01-50%	3.9	2.2	5.0	3.8
	50.01+	86.1	73.9	81.3	91.3
	Bez odgovora	1.3		1.3	1.6
	Ukupno	100.0	100.0	100.0	100.0
Širom Srbije	0%	87.1	100.0	73.8	89.7
	Do 25%	8.1		12.5	8.2
	25.01-50%	1.3		3.8	0.5
	50.01+	2.3		8.8	
	Bez odgovora	1.3		1.3	1.6
	Ukupno	100.0	100.0	100.0	100.0
U inostranstvu	0%	95.2	93.5	96.3	95.1
	Do 25%	1.6	2.2	2.5	1.1
	25.01-50%	1.3	2.2		1.6
	50.01+	0.6	2.2		0.5
	Bez odgovora	1.3		1.3	1.6
	Ukupno	100.0	100.0	100.0	100.0
Potrošači/klijenti					
U istom okrugu gde živim i radim	0%	5.5	21.7	3.8	2.2
	Do 25%	1.6	4.3	2.5	0.5
	25.01-50%	4.5		11.3	2.7
	50.01+	88.4	73.9	82.5	94.6
	Ukupno	100.0	100.0	100.0	100.0
Širom Srbije	0%	88.1	89.1	85.0	89.1
	Do 25%	6.5	6.5	3.8	7.6
	25.01-50%	3.9	4.3	8.8	1.6
	50.01+	1.6		2.5	1.6
	Ukupno	100.0	100.0	100.0	100.0
	0%	96.5	93.5	98.8	96.2
	Do 25%	2.3	2.2	1.3	2.7
	25.01-50%	0.6	2.2		0.5
	50.01+	0.6	2.2		0.5
	Ukupno	100.0	100.0	100.0	100.0

Izvor: Obračun autora

5. ZAKLJUČAK

Najvažniji rezultati rada se odose na novouspostavljene relacije koje se radom u kući (sopstveni biznis ili za poslodavca), ostvaruju između različitih regiona (centar, poluperiferija, periferija) i tipova naselja (selo, grad). Urbano-ruralne veze koje su nastale spajanjem mesta rada sa mestom stanovanja, posebno su se pokazale važnim za opstanak nepoljoprivrednih poslova ruralne periferije, pa tako za ekonomski razvoj i sa njim tesno povezanu demografsku održivost populaciono oslabljenog prostora u Srbiji. Teorijski okviri koji upućuju na uticaj distance od centralnog urbanog tržišta (Beograda), na primeru ispitanika koji su bili obuhvaćeni ovim istraživanjem, pokazali su da je distanca od Beograda značajan faktor koji uslovljava razlike u nivou diverzifikacije aktivnosti, i da zavisnost od Beograda opada od centra ka periferiji. Tako su poslovi koji se obavljaju od kuće jače povezani sa centralnim tržištem ako su locirani bliže

Beogradu (poluperiferija), nego ako su na periferiji. To znači da je kućni biznis periferije više oslonjen na lokalne kupce i dobavljače, čime u većoj meri doprinosi lokalnom ekonomskom razvoju. Efekti lokalnih transakcija (novčanih i robnih) i veza više koriste zajednicama ruralnog zaleđa nego urbanim centrima, jer su kućna mikro-preduzeća u ruralnim regijama oslonjena na lokalne resurse i lokalno tržište. Moguće objašnjenje lokalne orijentacije kućnog biznisa periferije jeste odsustvo komercijalnih firmi u ruralnom zaleđu, zbog čega je lokalnim firmama u uslovima slabe konkurencije lakše da održe svoje pozicije na tržištu.

Međutim, zbog svoje netransparentne prirode, rad u kući često izostaje iz razvojnih strategija i najčešće je „ispod radara" institucija za finansijku podršku biznisu (Ruiz and Walling, 2005; Pratt, 2006; Enterprise Nation, 2007; Dwelly et al, 2006). Nedostatak odgovarajuće statističke baze kojom bi se osvetlio fenomen rasta lokaciono fleksibilnih poslova učinio je da o radu od kuće postoje stereotipi, zbog kog izostaju intervenističke mere podrške. Sa druge strane, danas su perspektive fleksibilizacije poslova više nego očigledne i buduća istraživanja bi trebalo da obuhvate ekonomske, socijalne i ekološke benefite rada od kuće (rast zaposlenosti i standarda stanovništva, novi poslovi u seoskim sredinama, snažnije društvene mreže, bezbednije susedstvo, balans kuće i posla i dostupnost posla ranjivim grupama stanovništva), i detaljnije analize i konstrukciju demografskog i ekonomskog profila nepoljoprivrednog stanovništva koje živi i radi u ruralnim sredinama.

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Ljudski resursi i tržište rada u Hrvatskoj*

Human Resources and Labor Market in Croatia

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Sažetak: *U vrijeme demografskih promjena i sve većeg nedostatka radne snage, pronalazak zaposlenika, a prije svega kompetentnih zaposlenika sve je više u fokusu tvrtki. U ovom radu biti će riječi o ljudskim resursima i hrvatskom tržištu rada. Istraživanje je provedeno 2018. godine, konačan uzorak za analizu obuhvaćao je 1041 ispitanika, dobiveni rezultati na postavljena istraživačka pitanja rezultat su vlastite prosudbe ispitanika. Iz analize provedenog istraživanja proizlazi da 11 % ispitanika smatra da nisu spremi za hrvatsko tržište rada. Ispitanici kao glavni razlog nedovoljne spremnosti za hrvatsko tržište rada navode nepoštene odnose na tržištu rada (mito, korupcija, zapošljavanje preko veze). Nedostatak primjene znanja u praksi navode kao glavni nedostatak visokog obrazovanja, a s obzirom na situaciju neusklađenosti obrazovnog sustava i tržišta rada, ispitanici, njih 60%, su svjesni da su sami odgovorni za vlastitu konkurentnost na tržištu rada.*

Abstract: *At a time of demographic changes and a growing labor shortage, finding employees, and above all competent employees, is the focus of companies. This paper will discuss human resources and the Croatian labor market. The research was conducted in 2018, and the final sample for analysis included 1041 respondents, the results obtained on the research questions are the result of the respondents' judgment. From the analysis of the conducted research, it emerges that 11% of respondents believe that they are not ready for the Croatian labor market. Respondents cited unfair relations in the labor market (bribery, corruption, employment through connections) as the main reason for insufficient readiness for the Croatian labor market. They cite the lack of application of knowledge in practice as the main disadvantage of higher education, and considering the situation of mismatch between the education system and the labor market, 60% of respondents are aware that they are responsible for their competitiveness in the labor market.*

1. UVOD

U današnjem poslovnom svijetu, kojeg karakteriziraju iznimna dinamičnost i nepredvidivost, sve više pažnje posvećuje se zapošljavanju kompetentne radne snage, ljudski resurs je u 21.st. prepoznat kao bitan faktor uspjeha mnogih organizacija i smatra se izvorom trajne konkurentske prednosti. Veliki interes tvrtki za pronalaskom kompetentnih zaposlenika posljedica je njihove međusobne povezanosti s važnim organizacijskim parametrima uspješnosti tj. ključnim pokazateljima uspješnosti. No, u vrijeme demografskih promjena i sve većeg nedostatka radne snage, pronalazak zaposlenika, a prije svega kompetentnih zaposlenika predstavlja sve veći izazov za mnoge tvrtke.

U ovom radu biti će rijeci o hrvatskom tržištu rada, točnije o nezaposlenosti radne snage tj. ljudskih resursa i potražnji za radnom snagom te će biti prikazani rezultati stavova ispitanika tj. studenata o sljedećim temama:
- smatraju li se spremnima za hrvatsko tržište rada, ako ne,
- što vide kao glavni razlog nedovoljne pripremljenosti za hrvatsko tržište rada,
- što smatraju nedostacima visokog obrazovanja u pogledu povezanosti s potrebama tržišta rada,
- koliko procjenjuju da su sami odgovorni za vlastitu konkurentnost na tržištu rada.

* Rad je nastao na temelju doktorske disertacije „Tržište rada i kompetencije 21. stoljeća na primjeru visokoobrazovanih ljudskih resursa Republike Hrvatske“, koji je 05.06.2021. obranjen pri European center for peace and development of the University for Peace est. by the United Nations (Beograd)

[1] Neovisna istraživačica

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Rad je podijeljen u pet cjelina. Prvu cjelinu čini uvod. U drugoj cjelini biti će riječi o hrvatskom tržištu rada. U trećoj cjelini predstavljeni su ciljevi i metodologija rada. U četvrtoj cjelini predstavljeni su rezultati istraživanja. Petu cjelinu čini zaključak rada.

2. TRŽIŠTE RADA U HRVATSKOJ

Hrvatsko gospodarstvo obilježava visoka nezaposlenost te spora dinamika otvaranja novih radnih mjesta zbog više čimbenika, uključujući i nefleksibilno tržište rada (Božiković, 2021). Hrvatsko tržište rada se već duži niz godina suočava s procesom postupnog smanjenja radne snage koji se javlja kao posljedica negativnih demografskih kretanja i emigracije stanovništva (vidi tablicu 1), a što s vremenom smanjuje ponudu i povećava prosječnu starost radne snage.

Tablica 1. Procjene stanovništva

Godina	2015.	2016.	2017.	2018.	2019.	2020.	2021.
Republika Hrvatska	broj	broj	broj	broj	broj	broj	Broj
	4.190.669	4.154.213	4.105.493	4.076.246	4.058.165	4.036.355	3.899,0

Izvor: DZS (Državni zavod za statistiku), 2022.

Privremeni podaci Državnog zavoda za statistiku bilježe da je broj stanovnika Hrvatske prema popisu iz 2021. godine pao ispod četiri milijuna te iznosi 3.899,0 stanovnika (DZS, 2022.). Mimo pada broja stanovnika, na hrvatsko tržište rada također je utjecao proces tranzicije i restrukturiranja gospodarstva, koji je za posljedicu imao manjak potrebnih znanja i vještina te su rezultat djelovanja ovih procesa visoka i dugotrajna nezaposlenost, strukturna neusklađenost ponude i potražnje, kako prema brojnosti odgovarajućih kvalifikacija i zanimanja tako i prema konkretnim znanjima i vještinama koje su potrebne za prilagodljive i fleksibilne gospodarske subjekte. Posljedično tome se broj nezaposlenih od 2008. do 2012. godine povećao sa 149.000 na 272.000., odnosno za visokih 82,55%. (Hrvatski sabor, 2014.). Prema posljednjim podacima Hrvatskog zavoda za zapošljavanje prosječni broj nezaposlenih povećao sa 128.650 u 2019. godini na 150.824 u 2020. godini, što je porast od 17,2% (HZZ, 2020.).

Tablica 2. Prosječan broj nezaposlenih osoba prema dobi u 2019. i 2020. godini

Dob	2019.		2020.		Indeks 2020./2019.
	Broj	%	Broj	%	
Od 15 do 19	5.412	4,2	6.236	4,1	115,2
Od 20 do 24	13.682	10,6	17.436	11,6	127,4
Od 25 do 29	14.611	11,4	18.700	12,4	128,0
Od 30 do 34	12.282	9,5	14.980	9,9	122,0
Od 35 do 39	12.475	9,7	15.184	10,1	121,7
Od 40 do 44	12.765	9,9	15.242	10,1	119,4
Od 45 do 49	13.040	10,1	15.054	10,0	115,4
Od 50 do 54	14.909	11,6	16.588	11,0	111,3
Od 55 do 59	17.504	13,6	18.726	12,4	107,0
60 i više	11.970	9,3	12.678	8,4	105,9
UKUPNO	128.650	100,0	150.824	100,0	117,2

Izvor: HZZ (Hrvatski zavod za zapošljavanje), 2020.

Prosječni broj nezaposlenih iz 2019. u 2020. godini povećao se kod većine dobnih skupina. Najveći porast broja nezaposlenih bilježe osobe u dobi od 25 do 29 godina, u ovoj dobroj skupini nezaposlenost se povećala za 28%, te osobe u dobi od 20 do 24 godina, u ovoj dobroj skupini

nezaposlenost se povećala za 27,4%. Porast broja nezaposlenih starije dobi bio je manji; broj nezaposlenih u dobi od 50 do 54 godine povećao se 11,3%, dok je broj nezaposlenih u dobi od 55 do 59 godina povećao za 7,0%. Najmanje povećanje, od 5,9%, zabilježeno je kod skupine u dobi od 60 i više godina (HZZ, 2020.).

Ako promatramo broj nezaposlenih osoba (tablica 2) i broj prijavljenih slobodnih radnih mjesta (tablica 3) onda, naizgled, imamo dovoljan broj nezaposlenih da bi se zadovoljile potrebe i pokrio dio prijavljenih slobodnih radnih mjesta. Međutim, dobna i kvalifikacijska struktura nezaposlenih osoba znatno je lošija od strukture traženih kvalifikacija na tržištu rada, teško je uskladiti strukturu potrebnih znanja i vještina sa strukturom znanja nezaposlenih osoba među kojima više od 50% traži posao dulje od godinu dana (Bejaković, 2018.).

Tablica 3. Prijavljena slobodna radna mjesta prema rodu zanimanja u 2019. i 2020. godini

Rod zanimanja (NKZ 10)	2019.		2020.		Indeks 2020./2019.
	Broj	%	Broj	%	
Vojna zanimanja	0	0,0	0	0,0	-
Zakonodavci/zakonodavke, dužnosnici/dužnosnice i direktori/direktorice	152	0,1	169	0,1	111,2
Znanstvenici/znanstvenice, inženjeri/inženjerke i stručnjaci/stručnjakinje	48.555	21,7	41.191	25,0	84,8
Tehničari/tehničarke i stručni suradnici/stručne suradnice	15.837	7,1	11.887	7,2	75,1
Administrativni službenici/administrativne službenice	17.065	7,6	10.090	6,1	59,1
Uslužna i trgovačka zanimanja	51.463	23,0	31.262	19,0	60,7
Poljoprivrednici/poljoprivrednice, šumari/šumarke, ribari/ribarke, lovci/lovkinje	678	0,3	580	0,4	85,5
Zanimanja u obrtu i pojedinačnoj proizvodnji	32.444	14,5	27.344	16,6	84,3
Rukovatelji/rukovateljice postrojenjima i strojevima, industrijski proizvođači/industrijske proizvođačice i sastavljači/sastavljačice proizvoda	14.078	6,3	8.193	5,0	58,2
Jednostavna zanimanja	43.915	19,6	34.044	20,7	77,5
UKUPNO	224.187	100,0	164.760	100,0	73,5

Izvor: HZZ (Hrvatski zavod za zapošljavanje), 2020.

Ukupan broj prijavljenih slobodnih radnih mjesta iz 2019. godine smanjio se u 2020. godini. Poslodavci su u 2020. godini u usporedbi s 2019. prijavili neznatno povećanu potražnju za radnicima u rodu zanimanja: zakonodavci/zakonodavke, dužnosnici/dužnosnice i direktori/direktorice. Ostala zanimanja prema rodu bilježe smanjenu potražnju.

Zbog trajno povećanog broja nezaposlenih u Hrvatskoj poslodavci se ponašaju kao da je radna snaga uvijek dostupna, što za posljedicu ima vrlo niska ulaganja u obrazovanje zaposlenika. Međutim, Hrvatski zavod za zapošljavanje ukazuje na nedostatak određenih kadrova, postojanje deficitarnih zanimanja te nepostojanje potrebne kompetentnosti kod onih koji se javljaju za obavljanje poslova. Može se očekivati da će rast potražnje u gotovo svim sektorima zahtijevati značajan napor da se nezaposleni aktiviraju i dodatno osposobe za kompetentno obavljanje posla. No, treba naglasiti da ni obrazovni sustav, posebno u dijelu strukovnih programa, ne prati potrebe tržišta rada dovoljno učinkovito, što dovodi do neusklađenosti, posebno kod praktičnih znanja i vještina. To najviše pogađa mlade koji imaju teškoća s uključivanjem na tržište rada (Obadić, 2017).

Tablica 4. Broj nezaposlenih prema razini obrazovanja u 2017. i 2018. godini u Hrvatskoj

Razina obrazovanja	2019.		2020.		Indeks 2020./2019.
	Broj	%	Broj	%	
Bez škole i nezavršena osnovna škola	8.087	6,3	8.297	5,5	102,6
Osnovna škola	25.109	19,5	27.135	18,0	108,1
SŠ za zanimanja do 3 godine i škola za KV i VKV radnike	38.666	30,1	46.321	30,7	119,8
SŠ za zanimanja u trajanju od 4 i više godina i gimnazija	36.394	28,3	44.574	29,6	122,5
Prvi stupanj fakulteta, stručni studij i viša škola	8.559	6,7	10.558	7,0	123,4
Fakultet, akademija, magisterij, doktorat	11.835	9,2	13.939	9,2	117,8
UKUPNO	128.650	100,0	150.824	100,0	117,2

Izvor: HZZ (Hrvatski zavod za zapošljavanje), 2020.

Broja nezaposlenih svih razina obrazovanja bilježi porast u 2020. godini, dok broj slobodnih radnih mjesta u istom periodu pada. Razlog ovome može biti neusklađenost kompetencija nužnih na radnom mjestu i ishoda učenja obrazovnih programa, što je moguće prevazići mehanizmima za utvrđivanje stvarnih potreba tržišta rada te izrade relevantnih programa obrazovanja i osposobljavanja. Ovaj podatak također upućuju na neiskorištenost ljudskih potencijala za razvoj.

Raskorak između ponude i potražnje rada moguće prevladavati mjerama aktivne politike tržišta rada koje sadržavaju tri temeljne potkategorije (Kerovec, 1997.):
- posredovanje (*job broking*) sa svrhom da se proces usuglašavanja slobodnih radnih mjesta i tražitelja zaposlenja učini što učinkovitijim,
- obrazovanje za tržište rada (*labor market training*) sa svrhom unaprjeđenja i prilagođavanja vještina i znanja tražitelja zaposlenja,
- neposredno kreiranje radnih mjesta (*direct job creation*) koje može poprimiti oblik zapošljavanja u javnom sektoru ili sufinanciranja zapošljavanja u privatnom sektoru.

3. CILJEVI I METODOLOGIJA ISTRAŽIVANJA

Cilj ovoga istraživanja bio je dati odgovore na sljedeća pitanja:
- smatraju li se studenti spremnima za hrvatsko tržište rada, ako ne,
- što vide kao glavni razlog nedovoljne pripremljenosti za hrvatsko tržište rada,
- što smatraju nedostacima visokog obrazovanja u pogledu povezanosti s potrebama tržišta rada,
- koliko procjenjuju da su sami odgovorni za vlastitu konkurentnost na tržištu rada.

Dobiveni rezultati i odgovori na postavljena istraživačka pitanja rezultat su uvjerenja i vlastite prosudbe ispitanika u provedenom istraživanju. U istraživanju su sudjelovali studenti četiri najveća hrvatska sveučilišta, čiji su fakulteti prema Državnom zavodu za statistiku u trenutku istraživanja bilježili najveći broj upisanih studenata u prethodnih deset godina (DZS, 2017: 483-502; DZS, 2016: 505-524; DZS, 2015: 513-530), što za hrvatsko tržište znači najveći broj radnika tih profila na tržištu rada. Sveučilišta, čiji su studenti sudjelovali u istraživanju su Sveučilište u Rijeci (Ekonomski fakultet, Pravni fakultet, Tehnički fakultet, Filozofski fakultet – Odjel za pedagogiju i Odjel za informatiku), Sveučilište u Splitu (Ekonomski fakultet, Pravni fakultet, Fakultet elektrotehnike, strojarstva i brodogradnje, Filozofski fakultet – Odjel za pedagogiju), Sveučilište u Zagrebu (Ekonomski fakultet, Pravni fakultet, Fakultet elektrotehnike i računarstva, Filozofski fakultet – Odjel za pedagogiju i Odjel za informatiku) te Sveučilište Josipa

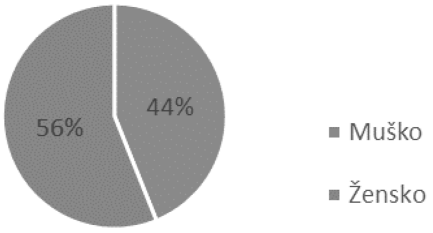
Jurja Strossmayera u Osijeku (Ekonomski fakultet, Pravni fakultet, Elektrotehnički fakultet i Filozofski fakultet – Odjel za pedagogiju i informacijske znanosti).

Za primarnu metodu prikupljanja podataka odabran je anketni upitnik s Likertovom skalom. Pomoću anketnog upitnika prikupljeni su stavovi studenata o istraživačkim pitanjima. Kao sekundarna metoda prikupljanja podataka korišteni su podatci iz raznih unutrašnjih i vanjskih izvora. Unutrašnji izvori bili su razni zapisi, datoteke i izvještaji, a vanjski knjižnice i razne druge statistike. Prednost sekundarnih podataka bila je ta što su podatci već bili prikupljeni, a nedostatak što su takvi podatci često zastarjeli. Anketa je provedena u akademskoj godini 2017/2018. Istraživački uzorak je bio uzorak s namjernim pristupom, a anketiranje je provela

autorica ovog teksta. Prepreku su predstavljali način organizacije nastave na završnim godinama studija, zbog čega je anketiranje zahtijevalo duži period realizacije.

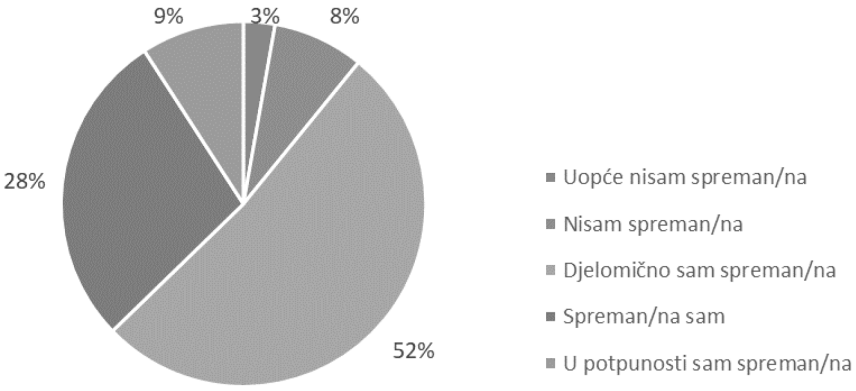
4. REZULTATI ISTRAŽIVANJA

U ovom poglavlju predstavljeni su rezultati istraživanja. Dobiveni rezultati i odgovori na postavljena istraživačka pitanja rezultat su uvjerenja i vlastite prosudbe ispitanika u provedenom istraživanju.



Grafički prikaz 1. Spol ispitanika
Izvor: Dedukić, 2018., rezultati primarnog istraživanja

Anketni upitnik ispunilo je 1041 student zadnje godine diplomskog studija navedenih studijskih programa, a od toga 56 % žena te 44 % muškaraca.

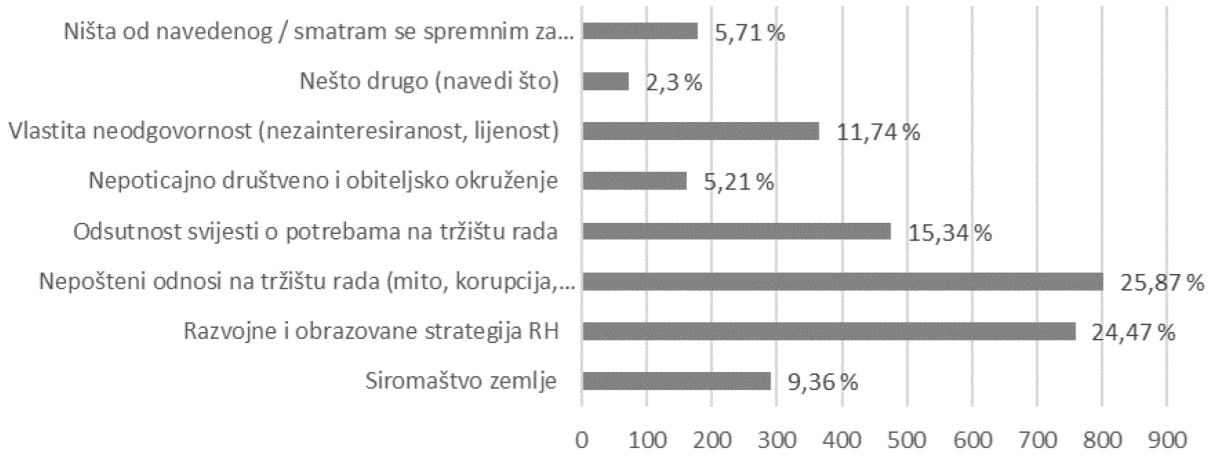


Grafički prikaz 2. Spremnost studenata za hrvatsko tržište rada
Izvor: Dedukić, 2018., rezultati primarnog istraživanja

11 % ispitanika procjenjuje da nisu ili uopće nisu spremi za tržište rada, njih 52 % procjenjuje da su djelomično spremi za tržište rada, dok 37 % studenata procjenjuje da su spremni ili u potpunosti spremni za tržište rada.

Treba istaknuti da obrazovni sustav Republike Hrvatske ne slijedi dinamične zahtjeve tržišta rada i poslodavaca. Neusklađenost politike obrazovanja i potreba na tržištu rada je strukturni

problem koji se ne može riješiti „preko noći“, a dosadašnje analize hrvatskog tržišta rada pokazuju velike neusklađenosti postojećih potreba i ponude odgovarajuće radne snage zbog čega je jedan od najvećih izazova poslodavaca u RH upravo pronalaženje adekvatne radne snage (Obadić, 2017).

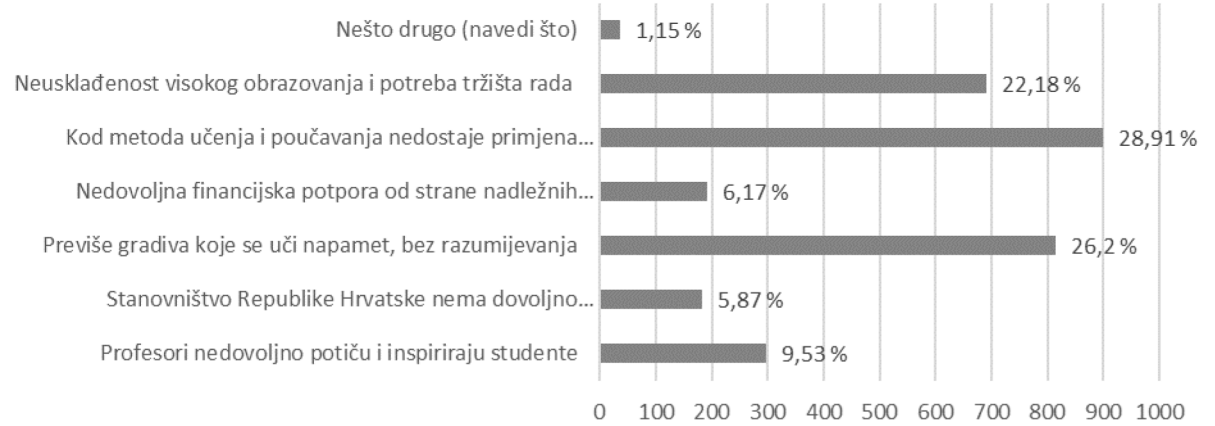


Grafički prikaz 3. Razlozi nedovoljne pripremljenosti za tržište rada

Izvor: Dedukić, 2018., rezultati primarnog istraživanja

25,87 % ispitanika kao glavni razlog nedovoljne spremnosti za tržište rada navodi nepoštene odnose na tržištu rada (mito, korupcija, zapošljavanje preko veze), njih 24,47 % smatra da su neadekvatne razvojne i obrazovane strategija RH razlog nedovoljne spremnosti za tržište rada te 15,34 % ispitanika navodi odsutnost svijesti o potrebama na tržištu rada kao razlog nedovoljne spremnosti.

Izostanak sustava usklađivanja obrazovanja s potrebama tržišta rada stvara strukturnu nezaposlenost i onemogućava razvoj koji se temelji na domaćim ljudskim resursima. Obrazovanje koje nije relevantno za tržište rada, nositelji tih kvalifikacija unatoč završenom programu ostaju nezaposleni jer znanja i vještine koje mogu ponuditi na tržištu rada (poslodavcima) nisu potrebne ili je previše, odnosno premalo školovanih osoba s pojedinom kvalifikacijom u odnosu na potrebe tržišta rada (Ministarstvo rada i mirovinskoga sustava, 2015.).

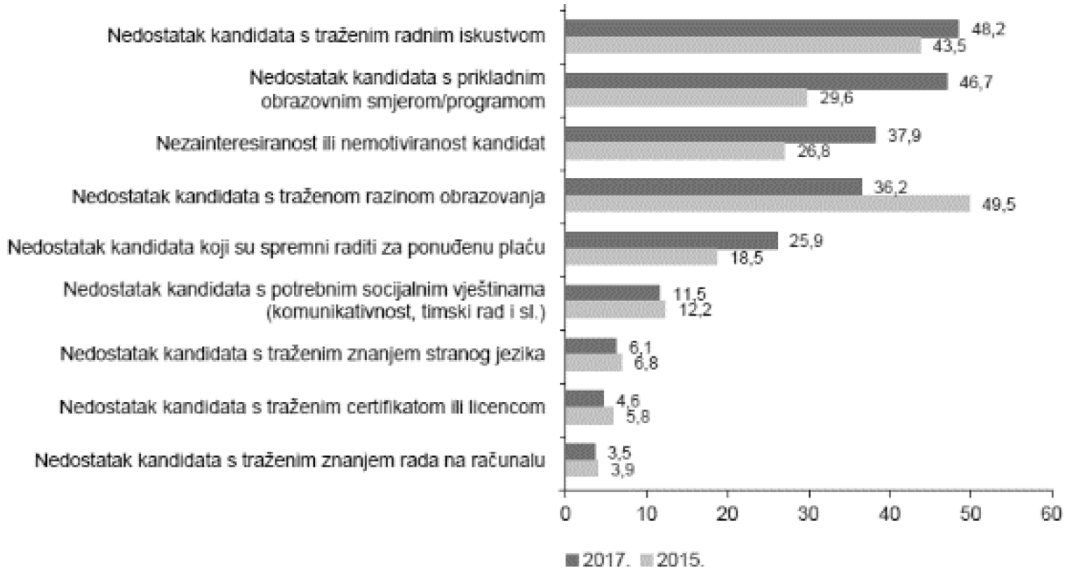


Grafički prikaz 4. Nedostaci visokog obrazovanja u RH

Izvor: Dedukić, 2018., rezultati primarnog istraživanja

Prema mišljenju ispitanika, najveći nedostaci visokog obrazovanja u Hrvatskoj su:
- kod metoda učenja i poučavanja nedostaje primjena znanja u praksi – 28,91 %
- previše gradiva koje se uči napamet, bez razumijevanja – 26,2 %
- neusklađenost visokog obrazovanja i potreba tržišta rada – 22,18 %
- profesori nedovoljno potiču i inspiriraju studente – 9,53 %
- nedovoljna financijska potpora nadležnih institucija – 6,17 %
- stanovništvo Republike Hrvatske nema dovoljno razvijenu svijest o važnosti visokog obrazovanja – 5,87 %.

Nedostatak primjene znanja u praksi i učenje gradiva bez razumijevanja razlozi su zbog kojih poslodavci sve manje pozornosti obraćaju na formalno obrazovanje. Poslodavcima su važne vještine, a ne papir. No, prema zakonskoj obavezi, državne tvrtke dužne su formalno obrazovanje tretirati kao osnovni uvjet pri zapošljavanju. Hrvatski zavod za zapošljavanje je u 2017. godini proveo istraživanje u kojem su prikupljeni stavovi poslodavaca o poteškoćama pri nalaženju radnika za zapošljavanje (vidi grafički prilaz 5).

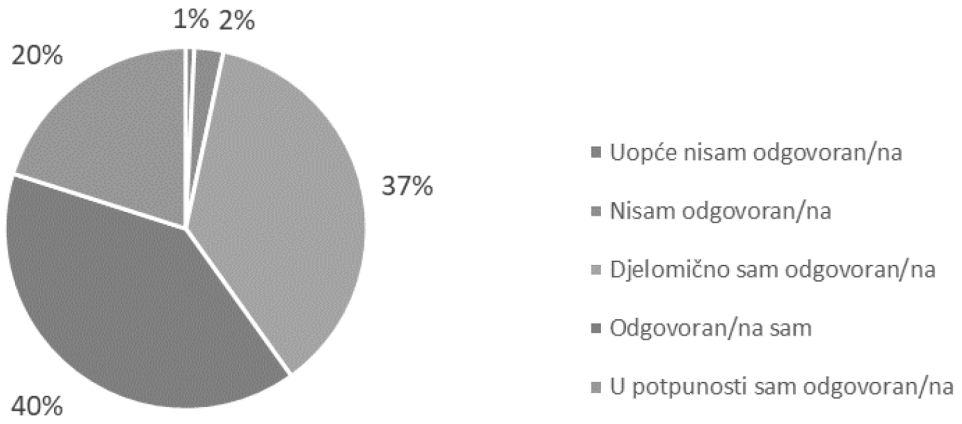


Grafički prikaz 5. Razlozi koji su poslodavcima stvarali poteškoće pri nalaženju radnika za zapošljavanje

Izvor: HZZ (Hrvatski zavod za zapošljavanje), 2017.

Problem nedostatka radnika s traženim iskustvom najprisutniji je kod poslodavaca državnog ili javnog oblika vlasništva, njih 48,2 % je označilo ovu poteškoću kao prepreku u pronalasku radnika. 46,7 % poslodavaca navelo je kao poteškoću nedostatak kandidata s prikladnim obrazovnim smjerom/programom. Ovaj podatak ponovno upućuje na neusklađenost ponude i potražnje na tržištu rada. 37,9% poslodavaca navelo je nezainteresiranost i nemotiviranost kandidata kao prepreku u pronalasku radnika.

Rezultati anketiranja pokazuju da su hrvatski studenti, s obzirom na situaciju neusklađenosti obrazovnog sustava i tržišta rada, itekako svjesni da su sami odgovorni za vlastitu pripremu i konkurentnost na tržištu rada. Na grafičkom prikazu 6 može se uočiti da samo ukupno 3 % ispitanika smatra da uopće nisu ili nisu odgovorni za vlastitu pripremu za tržište rada, 37 % ispitanika smatra da su djelomično odgovorni, 40 % ispitanika smatra da su odgovorni, a 20 % ispitanika smatra da su u potpunosti odgovorni za vlastitu pripremu za tržište rada.



Grafički prikaz 6. Odgovornost za vlastitu pripremu za tržište rada

Izvor: Dedukić, 2018., rezultati primarnog istraživanja

S obzirom na neusklađenost potreba hrvatskog tržišta rada i obrazovnog sustava, mladi su često prepušteni sami sebi da nakon formalnog obrazovanja vode brigu o vlastitoj konkurentnosti na tržištu. Pohađanje raznih tečajeva i seminara kao oblika dodatne izobrazbe, tj. stjecanje znanja koje nije stečeno tijekom školovanja, dio je vlastite odgovornosti (Dedukić, 2021.).

5. ZAKLJUČAK

Ljudski resurs je u 21.st. prepoznat kao bitan faktor uspjeha mnogih organizacija i smatra se izvorom trajne konkurentske prednosti. Međutim, hrvatski obrazovni sustav, ne prati potrebe tržišta rada dovoljno učinkovito, što dovodi do neusklađenosti ponude i potražnje, posebno kod praktičnih znanja i vještina. To najviše pogađa mlade, koji imaju teškoće s uključivanjem na tržište rada te su nakon formalnog obrazovanja prepušteni sami sebi da vode brigu o vlastitoj konkurentnosti na tržištu.

Ovo istraživanje provedeno je 2018. godine, konačan uzorak za analizu obuhvaćao je 1041 ispitanika tj. studenta zadnje godine diplomskog studija. Dobiveni rezultati na postavljena istraživačka pitanja rezultat su vlastite prosudbe ispitanika. Iz analize provedenog istraživanja proizlazi da 11 % ispitanika procjenjuje da nisu ili uopće nisu spremi za tržište rada, njih 52 % procjenjuje da su djelomično spremi za tržište rada, dok 37 % studenata procjenjuje da su spremni ili u potpunosti spremni za tržište rada. 25,87 % ispitanika kao glavni razlog nedovoljne spremnosti za tržište rada navodi nepoštene odnose na hrvatskom tržištu rada (mito, korupcija, zapošljavanje preko veze), njih 24,47 % smatra da su neadekvatne razvojne i obrazovane strategija RH razlog njihove nedovoljne spremnosti za tržište rada te 15,34 % ispitanika navodi odsutnost svijesti o potrebama na tržištu rada kao razlog nedovoljne spremnosti. Treba istaknuti da, obzirom na situaciju neusklađenosti obrazovnog sustava i tržišta rada, ispitanici, njih 60%, su itekako svjesni da su sami odgovorni za vlastitu konkurentnost na tržištu rada.

Obrazovanje za potrebe tržišta rada potrebno je pojedincu da bi odgovorio na potrebe i zahtjeve suvremenih globalizacijskih promjena, u kojima svaki pojedini građanin treba širok raspon znanja, vještina i kompetencija da bi se što lakše i brže prilagodio društvu i svijetu u kojemu živi i radi. Hrvatska zbog neusklađenosti ponude i potražnje bilježi trajno povećan broj nezaposlenih, dok Hrvatski zavod za zapošljavanje ukazuje na nedostatak određenih kadrova.

U borbi protiv nezaposlenosti diljem europskih zemalja koriste se mjere kao što su usavršavanje, javni radovi, subvencionirano zapošljavanje, pomoć pri zapošljavanju i slično. Samo planiranje potrebnih resursa korištenjem stimulacija za odabir traženih zanimanja, određivanje upisnih kvota na fakultetima i školama te prilagođavanje obrazovnih programa potrebama tržišta, uz dostatnu financijsku potporu, može dovesti do poboljšanja strukture ponude i potražnje na tržištu rada.

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Stavovi i znanje potrošača o konceptu i oznaci pravedne trgovine

Consumer Attitudes and Knowledge about the Concept and Signs of Fair Trade

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Znanje;
Ekološke oznake

Keywords:
Fair trade;
Sustainable development;
Attitudes;
Knowledge;
Ecolabels

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Saţetak: *Koncept pravedne trgovine (engl. Fairtrade) razvijen je prvenstveno s ciljem kako bi se poljoprivrednicima i radnicima zemalja u razvoju platile pravedne cijene njihovog rada. To je sustav certificiranja kojemu je cilj osigurati ispunjavanje niza standarda u proizvodnji i opskrbi proizvoda ili sastojaka. Za poljoprivrednike i radnike koncept pravedne trgovine znači radnička prava, sigurnije radne uvjete i pravedniju plaću. Za kupce pak to znači visokokvalitetne i etički proizvedene proizvode. Povezujući se sa zemljama u razvoju i pomažući im na takav način, razvijene zemlje sudjeluju u društveno odgovornom poslovanju i promicanju održivog razvoja. Koncept pravedne trgovine teži poboljšanju egzistencije, jačanju organizacije proizvođača, podizanju svijesti potrošača o raznim negativnim učincima na proizvođače međunarodne trgovine, zaštiti osnovnih ljudskih prava promicanjem socijalne pravde, očuvanju okoliša i ekonomskoj sigurnosti. No, sam pojam pravedne trgovine u svijetu još uvijek nije dovoljno prepoznatljiv. Svrha ovog rada je analiza dosadašnje teorijske spoznaje o pojmu, značenju i svrsi pravedne trgovine te prethodnih istraživanja vezanih uz prepoznatljivost i shvaćanje navedenog pojma. Također, cilj rada je kroz provedbu primarnog istraživanja utvrditi stavove i znanje potrošača o oznaci pravedne trgovine u Hrvatskoj kako bi se spoznalo koliko populacija (pre)poznaje sustav pravedne trgovine te kolika je razina povjerenja u samu oznaku pravedne trgovine. Na temelju rezultata istraživanja, rad će dati preporuke za djelovanja s ciljem povećanja svjesnosti i znanja o pravednoj trgovini.*

Abstract: *The concept of fair trade (Fairtrade) was developed primarily to pay farmers and workers in developing countries fair prices for their work. It is a certification system that aims to ensure that a set of standards in the production and supply of products or ingredients are met. For farmers and workers, the concept of fair trade means workers' rights, safer working conditions and a fairer wage. For customers, this means high-quality and ethically produced products. By connecting with and helping developing countries in this way, developed countries participate in socially responsible business and the promotion of sustainable development. The concept of fair trade aims to improve the existence, strengthen the organization of producers, raise consumer awareness of various negative effects on producers of international trade, and protect basic human rights by promoting social justice, preserving the environment and economic security. But the very notion of fair trade in the world is still not sufficiently recognizable. The purpose of this paper is to analyze the current theoretical knowledge about the concept, meaning and purpose of fair trade and previous research related to the recognizability and understanding of this concept. Also, this paper aims to determine the attitudes and knowledge of consumers about the fair trade label in Croatia through the implementation of primary research to find out how much the population (re) knows about the fair trade system and what is the level of trust in the fair trade label. Based on the results of the research, the paper will provide recommendations for actions aimed at increasing awareness and knowledge about fair trade.*

1. UVOD

Još od davnih dana, trgovina se smatra glavnom osnovom za stvaranje bogatstva. Kako bi se što bolje trgovala roba diljem svijeta uz bolje cijene, pristojne radne uvjete te uspostavio pravedni sporazum sa poljoprivrednicima i radnicima u zemljama u razvoju uveden je koncept pod nazivom pravedna trgovina (eng. Fairtrade). Pravedna trgovina kao sustav, povezuje velike konkurentne tvrtke, bogate države i vlade sa poljoprivrednicima i radnicima u zemljama u razvoju, te svojim načinom poslovanja, upravo te države i tvrtke potiču globalno društveno odgovorno poslovanje. Raynolds i dr. (2007) smatraju kako je pravedna trgovina na neki način odgovor na negativne posljedice globalizacije te na često nepravednu prirodu suvremene međunarodne

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trgovine, pa se smatra kako je ona pokret „nove globalizacije". Kao što je već navedeno, početak pravedne trgovine započeo je tako što su crkvene organizacije počele prodavati ručne radove iz raznih opustošenih zemalja, te su nakon toga izravne marketinške veze postale glavno uporište solidarnosti i pravičnosti u odnosima koje su kasnije definirali u značajke pokreta pravedne trgovine. Upravo nakon toga, ovakve marketinške inicijative motivirale su potrošače savješću, te su obećavale vraćanje većeg dijela tržišne cijene proizvođačima zemalja u razvoju upravo na način da se uklanjaju posrednici te se pruža izravni put do njih. Pokret je započeo sa proizvodnjom ručnih radova, a danas su u to uključeni razni drugi prehrambeni proizvodi od kojih su najčešće kava, čaj, kakao, banane i slično (Raynolds i dr., 2007:7). Fairtrade se smatra pokretom koji za cilj ima smanjiti broj osiromašenih zemalja u razvoju i unaprijediti život radnicima i obiteljima u takvim zemljama te stvoriti jednakost u međunarodnoj trgovini (Petljak i dr., 2013).

Svrha ovog rada je analiza dosadašnje teorijske spoznaje o pojmu, značenju i svrsi pravedne trgovine te prethodnih istraživanja vezanih uz prepoznatljivost i shvaćanje navedenog pojma. Također, cilj rada je kroz provedbu primarnog istraživanja utvrditi stavove i znanje potrošača o oznaci pravedne trgovine u Hrvatskoj kako bi se spoznalo koliko populacija (pre)poznaje sustav pravedne trgovine te kolika je razina povjerenja u samu oznaku pravedne trgovine. Na temelju rezultata istraživanja, rad će dati preporuke za djelovanja s ciljem povećanja svjesnosti i znanja o pravednoj trgovini.

S obzirom da je velik broj organizacija i poduzeća fokusiran najviše na same potrošače i maksimiziranje profita, koncept pravedne trgovine trudi se prebaciti fokus na one kojima je to zaista potrebno kako bi se smanjilo globalno siromaštvo te zaustavilo izrabljivanje radnika i djece u zemljama u razvoju.

2. PRAVEDNA TRGOVINA U SVIJETU I U HRVATSKOJ

Kako se pravedna trgovina smatra partnerstvom sklopljenim između proizvođača i potrošača, a temelji se na povjerenju, transparentnosti i poštovanju prema poljoprivrednicima i radnicima osiromašenih zemalja, tako je veliki broj zemalja, među kojima je i Hrvatska prepoznao ovakav način trgovine i suradništva kao načina solidarnosti i pomoći gdje se pokušava stvoriti jednakost u međunarodnoj trgovini. Svjetska trgovinska organizacija određuje i definira pravednu trgovinu a na temelju koje se redovno druge subote u svibnju obilježava Svjetski dan pravedne trgovine.

Postoji niz istraživanja o Fairtrade-u koje su provodili znanstvenici iz različitih društvenih znanosti, npr. sociologije, političkih znanosti, geografije, ekonomije i antropologije, kao i poslovanja, marketinga, međunarodnog razvoja i drugih srodnih područja (Reynolds i Bennet, 2016; Ehrilich, 2010; Boorgoon, 2009; Darko et al., 2017 i dr.).

Prema različitim istraživanjima, potrošači su najviše upoznati sa Fairtrade oznakom i njenim funkcijama na glavnim tržištima pravedne trgovine, a to su zemlje Velika Britanija, Nizozemska, Švicarska, Irska, Njemačka i Finska. Ključno i najveće tržište Fairtrade proizvoda je Velika Britanija, gdje trenutno ima i više od 2 500 Fairtrade proizvoda, a vodeći svjetski maloprodavač proizvoda pravedne trgovine je Sainsbury's.

Tablica 1 prikazuje najčešće proizvode koji se izvoze iz različitih siromašnijih zemalja u bogatije zemlje i dio su sustava pravedne trgovine.

Tablica 1. Prikaz proizvoda i zemalja iz kojih dolaze proizvodi

Banane	Dominikanska Republika, Kolumbija i Ekvador
Kakao	Dominikanska Republika, Gana, Belize, Obala Bjelokosti
Kava	Etiopija, Tanzanija, Uganda, Kostarika, Gvatemala
Cvijeće	Kenija
Voće	Južna Afrika i Gana
Riža	Indija i Tajland
Šećer	Paragvaj i Malavija
Čaj	Uganda, Šri Lanka i Indija

Izvor: Petljak i dr., 2013.

Na Fakultetu primijenjene ekonomije Sveučilišta u Antwerpenu u Belgiji provedeno je istraživanje o znanju, uvjerenjima i stavovima potrošača kada je riječ o pravednoj trgovini. U ispitivanju je sudjelovalo 858 osoba, od kojih je 615 bilo odabrano iz javnosti, a 243 odabrano je prilikom posjeta Oxfam World Shops. Prema rezultatima, dokazano je kako ispitanici podržavaju ovaj koncept pravedne trgovine, ali određeni broj smatra kako organizacija pravedne trgovine mora više poraditi na oglašavanju i podučavanju ljudi o proizvodima pravedne trgovine, kada je riječ o prodavaonicama gdje se mogu takvi proizvodi pronaći te o samim proizvodima (Pelsmacker i dr., 2006).

Isto tako, provedeno je istraživanje na Sveučilištu u Napulju s ciljem otkrivanja čimbenika koji utječu na potrošače i njihove kupovne navike, te provjeravanje znanja i stavova potrošača o organskim i Fairtrade proizvodima kao i njihova motivacija za kupnju takvih proizvoda. Istraživanje se provelo anketiranjem ispitanika licem u lice, na temelju slučajnih 300 odabranika. Prema rezultatima istraživanja, kao i na prethodno navedenom, potrošači su upoznati s Fairtrade konceptom, ali smatraju kako populacija nije dovoljno informirana o samim pojedinostima koje ovaj pokret pruža, te čak 43% ispitanika smatra kako je označavanje etičkih proizvoda važan informacijski alat. Analizom se naglašava kako njihovu pažnju i motivaciju za kupovinom ovakvih proizvoda uglavnom ovisi o tome koliko oni smatraju da je to važno za njih, te njihovo povjerenje u takve proizvode (Annunziata i dr., 2011).

Prema ovim istraživanjima može se prepoznati potrošačka želja za znanjem i dobivanjem informacija o proizvodima s ekološkim i etičkim oznakama jer bez obzira što većina ljudi zna što je to i zbog čega se određeni proizvod kupuje, još uvijek nemaju dovoljno povjerenja u takve proizvode i njihovu vjerodostojnost. Fairtrade organizacije trebale bi više podučavati i pružati informacija o samom konceptu, te naglašavati koliko je ovaj način trgovine važan ne samo za smanjenje siromaštva, nego i za sami okoliš te brigu za socijalnu egzistenciju. Potrošači se najviše odlučuju za kupnju organskih i etičkih proizvoda iz nekoliko različitih razloga - to može bit njihov odnos prema zdravlju, briga za okoliš, etičko razmišljanje kao i sama kvaliteta proizvoda. Ehrilich (2010) navodi kako bi više od 90% ispitanika u istraživanju o pravednoj trgovini u SAD-u kupovalo Fairtrade proizvode da su široko dostupni i usporedive kvalitete s uobičajenim proizvodima. Preko 60% njih tvrdilo je da bi za takve proizvode platili 10% višu cijenu.

S obzirom da je Hrvatska poprilično kratko unutar ove organizacije, odnosno još uvijek se Hrvatsko tržište upoznaje sa proizvodima i samom Fairtrade oznakom, Fairtrade oznaka na proizvodima se može pronaći na relativno manjem broju mjesta. Hrvatsko tržište trenutno broji više od 30 različitih vrsta Fairtrade proizvoda, ali se radi na proširenju asortimana. Asortiman Fairtrade proizvoda na Hrvatskom tržištu sadrži banane, kavu, začinsko i ljekovito bilje, čokoladu, čaj, slastice, šećer, sok i bombone, ali također može se naći i nekih neprehrambenih proizvoda

kao što su proizvodi za njegu tijela, odjeća i obuća (Petljak i dr., 2013). S obzirom da na domaćem tržištu nije toliko razvijen koncept pravedne trgovine, većina maloprodavača je poprilično skeptična oko razvoja i proširenja Fairtrade proizvoda na tržištu.

3. Empirijsko istraživanje o poznavanju i stavovima potrošača o oznaci pravedne trgovine

3.1. Metodologija istraživanja

S obzirom da je koncept pravedne trgovine na Hrvatskom tržištu prilično kratko, odnosno nije toliko kratko koliko njegova rasprostranjenost na tržištu nije velika, provedeno je istraživanje na 157 ispitanika u Republici Hrvatskoj. Istraživanje je provedeno putem Interneta na temelju čega se pokušalo doći do informacija o poznavanju i stavovima potrošača na o konceptu i samoj oznaci pravedne trgovine, odnosno o Fairtrade proizvodima. Na temelju njihovih potrošačkih navika pokušalo se saznati kako na njih utječu ekološke, etičke i druge oznake koje se temelje na brizi za okoliš, brizi za socijalnu egzistenciju i brizi za unaprjeđenje života.

Iako sam Fair trade pokret nije globalno nov, još uvijek nije dovoljno prezentiran populaciji i još uvijek postoji određeni broj ljudi koji nije niti čuo za koncept pravedne trgovine kao pokreta unaprjeđenja života radnika i poljoprivrednika u osiromašenim zemljama, smanjivanju globalnog siromaštva i ujednačavanja međunarodne trgovine.

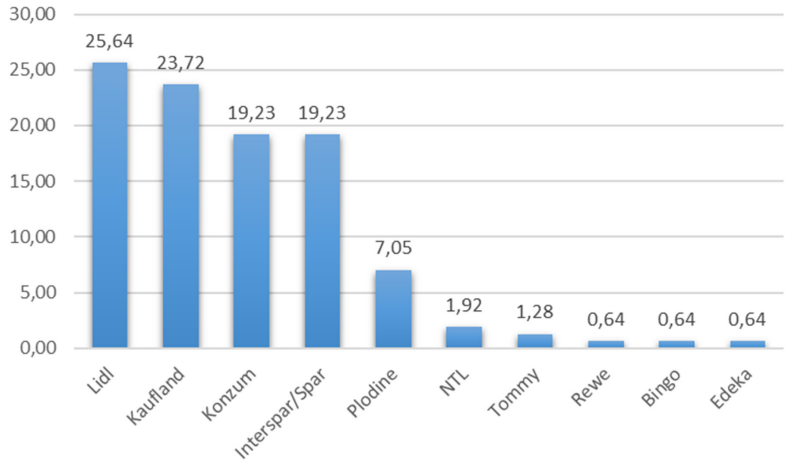
Na temelju ovog istraživanja pokušalo se doći do informacija o tome koliko je hrvatsko stanovništvo uopće upoznato sa sustavom pravedne trgovine, jesu li se do sada susreli s proizvodima koji na ambalaži imaju Fairtrade oznaku, jesu li kupili proizvode s navedenom oznakom te koliku razinu povjerenja imaju prema njoj. Upitnik je izrađen u Google Forms obrascu, te je istraživanje provedeno u periodu od 23. 6. 2021. do 7. 7. 2021.

3.2. Rezultati istraživanja

U istraživanju je sudjelovalo 157 osoba, od kojih je 128 ženskog roda (81,5%), te 29 osoba muškog roda (18,5%). Što se tiče dobne skupine, 58% tj. 91 ispitanik je u rasponu 18 do 25 godina, 48 ispitanika je u rasponu od 26 do 35 godina što iznosi 30,6% od ukupnog broja ispitanih, a najmanji broj ispitanih bilo je u rasponu od 45 do 55 godina sa 2,5%, odnosno 4 ispitanika. Najveći broj ispitanih ima visoku stručnu spremu, čak njih 62 što iznosi 39,5%, nešto manje ih ima srednju stručnu spremu sa 33,8%, dok je najmanji broj ispitanika od ukupnog broja ispitanih više stručne spreme sa 26,8%.

U istraživanju su sudjelovali ispitanici iz različitih mjesta, a četiri grada s najvećim brojem ispitanika su Pleternica, Zagreb, Požega i Osijek, od kojih Pleternica ima 25,48%, odnosno 40 ispitanika, Zagreb sa 20,38%, ispitanici iz Požege sa 19,11%, te Osijek sa 7,01%.

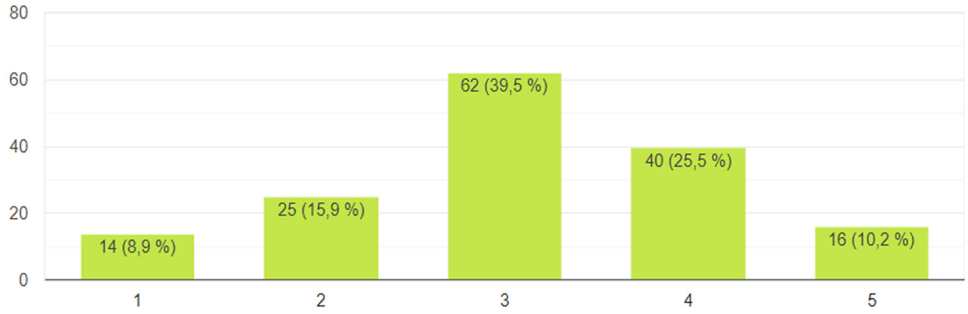
Nakon općenitih pitanja kao što su spol, dob, stručna sprema, mjesto prebivališta, slijedila su pitanja vezana za kupovne navike potrošača. Na pitanje u kojoj prodavaonici najčešće obavljaju kupnju prehrambenih proizvoda pokušalo se preko odgovora ispitanika saznati kupuju li u prodavaonicama gdje već postoje Fairtrade proizvodi i koliki broj ih s obzirom na kupovinu u tim prodavaonicama ima mogućnost uočavanja proizvoda pravedne trgovine.



Grafikon 1. Rezultati istraživanja - najčešće prodavaonice obavljanja kupovine
Izvor: Izrada autora

Na temelju odgovora ispitanika (Grafikon 1) uočava se kako najveći broj ispitanika, njih 40, što u postotku iznosi 25,64%, svoju kupovinu obavlja u Lidl trgovačkom lancu, slijede ga Kaufland sa 23,72%, Konzum i Interspar odnosno Spar sa 30 ispitanika, što je 19,23%, te Plodine, NTL, Tommy i ostale prodavaonice sa najmanjim brojem ispitanika.

Od ukupnih 157 ispitanika, 90 ih je odabralo kvalitetu kao najvažniji čimbenik prilikom kupovine prehrambenih proizvoda, a 39 njih cijenu. Okus kao faktor kupovine imao je 14 odgovora, marka proizvoda kao važan čimbenik 6 odgovora, te samo dva ispitanika odabrala su veličinu pakiranja, a isto tako dva ispitanika odgovorila su da im je bitno kakve oznake su na pakiranju, primjerice ekološke.



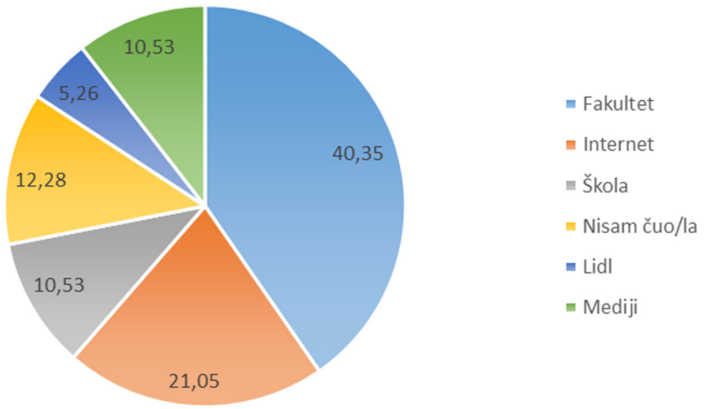
Grafikon 2. Rezultati istraživanja - važnost ekološke oznake na proizvodima
Izvor: Izrada autora

Prilikom kupovine smatra se kako kupci gledaju ambalažu te proučavaju podrijetlo proizvoda, kao i sami sastav proizvoda. Međutim, velika većina ispitanika, čak 62 odgovora, na pitanje koliko im je važna ekološka oznaka na proizvodu (Grafikon 2) prilikom kupovine, odgovorilo da im je svejedno, odnosno da niti im je važno niti nije, ali malo manje ispitanika, 25,5% odgovorilo je da im je važna takva oznaka. S druge strane, skoro podjednaki broj ispitanika odgovorilo je da im uopće nije važna ekološka oznaka (14 ispitanika, 8,9%) te suprotno tome da im je iznimno važna ekološka oznaka na proizvodu prilikom njihove kupovine (16 ispitanika, 10,2%).

Vrlo je važno bilo pitanje kojim je u cilju bilo saznati jesu li ispitanici upoznati sa konceptom pravedne trgovine, odnosno jesu li čuli do sada za taj pojam. Velika većina, njih 99, što je u postotku 63,5% nije se još susrelo sa pojmom pravedne trgovine (*Fairtrade*), dok je njih 57 (36,5%)

već na neki način upoznato s pojmom i već su se negdje susreli s njim. S obzirom na postotak onih koji su upoznati s pojmom i nije toliko malen, na sljedeće pitanje gdje su čuli za taj pojam (Grafikon 3) bilo je raznih odgovora.

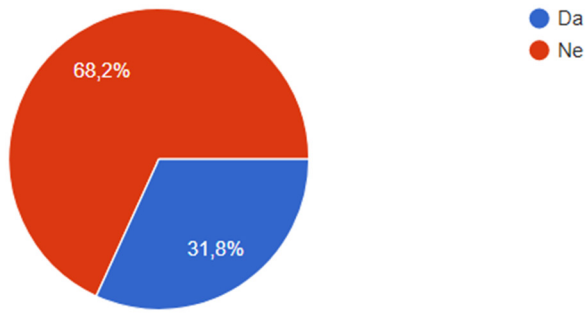
Najveći dio odgovora (pretpostavka je da su studenti) sa 40,35% je sa odgovorom da je mjesto na kojem su se susreli s pojmom pravedne trgovine bio fakultet. Sljedeći najveći dio odgovora bio je Internet sa 21,05% ispitanika što nije iznenađujuće s obzirom da je danas Internet postao središte izvora informacija te je do nekih stvari najjednostavniji način dolaska. Najmanji broj ispitanika sa 5,26% odgovorilo je da se susreo sa pojmom pravedne trgovine u trgovačkom lancu Lidl, što je pomalo iznenađujuće s obzirom da je u toj prodavaonici najveći broj proizvoda s Fairtrade oznakom, a na pitanje u kojoj prodavaonici se najčešće kupuje, čak njih 40 je stavilo upravo tu prodavaonicu.



Grafikon 3. Rezultati istraživanja - mjesta gdje su ispitanici čuli za pojam Pravedne trgovine (Fair trade)

Izvor: Izrada autora

Sljedeća pitanja bila su vezana za samu Fairtrade oznaku, pri čemu je postavljena slika koja prikazuje službenu oznaku pravedne trgovine koja se nalazi na proizvodima. Njih 107, u postotku je to 68,2%, nije se nikad susrelo s ovom oznakom niti ju je ikada vidjelo (Grafikon 4), a s druge strane 50 ispitanika (31,8%) već se susrelo s tom oznakom.



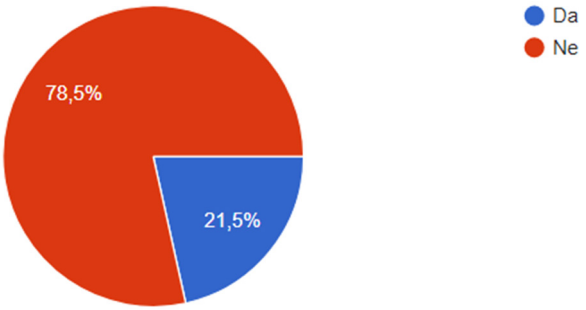
Grafikon 4. Rezultati istraživanja - koliki broj ispitanika je vidio Fair trade oznaku

Izvor: Izrada autora

Bilo je važno saznati ako su se već ispitanici susreli s oznakom pravedne trgovine, znaju li i što ona predstavlja i što ona znači. Tako je većina odgovora, sa 50% bila odgovora ne, što je bilo za očekivati, s obzirom na prethodne odgovore i broj onih koji nisu još čuli za ovaj pojam. Međutim, neki od odgovora bili su „Da je ljudima koji proizvode taj proizvod (npr: kakaovac za

čokoladu) dana pravedna plaća", „Pravedna trgovina omogućava onima koji rade na plantažama kakaovca da dobiju naknadu za svoj rad u zemljama trećeg svijeta, protivi se izrabljivanju ljudi i djece i sl.", „Da su radnici bili pravedno isplaćeni po pitanju njihova rada", „Neprofitna organizacija, spaja proizvođače i potrošače", „Označava pravedno postupanje prema radnicima, ne podržava rad djece, fer plaćanje", „Označava proizvode koji nose oznaku fairtradea odnosno svaki dionik u tom lancu je pošteno plaćen za svoj rad" i još mnogi drugi odgovori pri čemu se vidi da određeni dio populacije i razumije značenje koncepta pravedne trgovine.

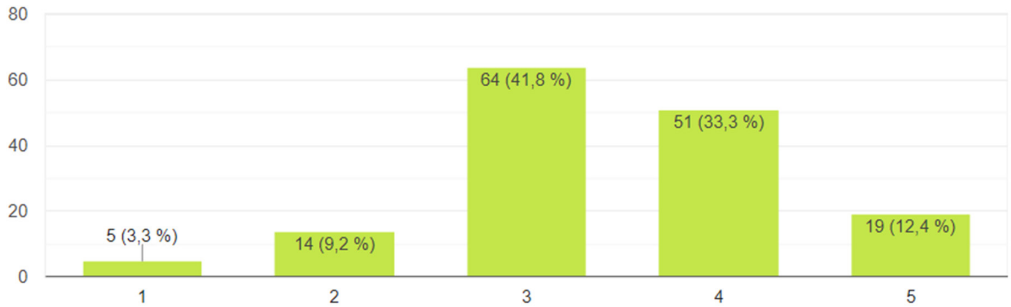
Nadalje, kratkim odgovorima ispitanici su na pitanje u kojim prodavaonicama su se susreli sa Fair trade oznakom i njezinim proizvodima najčešće pisali Lidl, njih 13 (19%), bilo je odgovora i Kaufland, Spar, Bio&Bio, Tvornica zdrave hrane, Internet, ali i dalje je puno bilo negacijskih odgovora gdje se ispitanici nisu još susreli s ovom oznakom i proizvodima koji ju imaju.



Grafikon 5. Rezultati istraživanja - Koliko je ispitanika kupilo proizvode s Fair trade oznakom

Izvor: Izrada autora

Kada je riječ o samoj kupovini proizvoda sa Fair trade oznakom (Grafikon 5), s obzirom na postotak od 31,8% ispitanika koji su vidjeli proizvode s ovom oznakom, samo ih se 21,5% odlučilo i kupiti proizvod, dok 78,5% ispitanika nije nikad kupilo proizvod s oznakom Fairtrade. Sljedeće pitanje bilo je usmjereno na ispitanike koji su kupili neki proizvod s Fairtrade oznakom pa je bilo potrebno odgovoriti koji su proizvod kupili a da ima navedenu oznaku. Najčešći odgovor bila je čokolada sa 44,12% ispitanika, bilo je odgovora kava i čaj u postotku od 17,65%, ali bilo je također i odgovora o kupovini shea maslaca i kozmetike Helena Delirium koja u sastavu ima sirovine koje se prodaju prema Fairtrade sustavu.

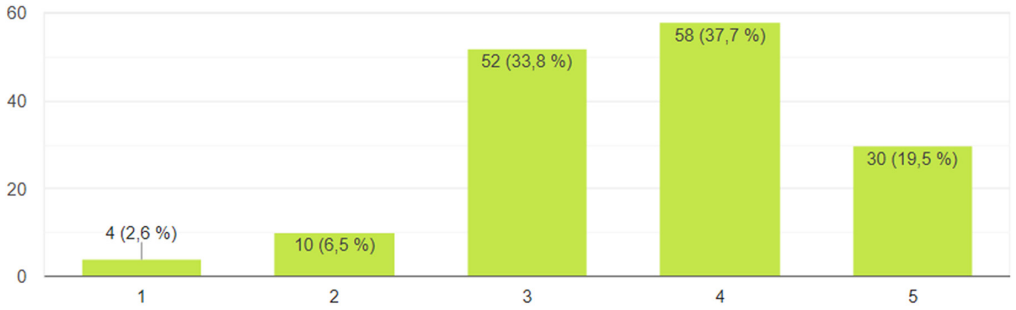


Grafikon 6. Rezultati istraživanja - povjerenje u oznaku

Izvor: Izrada autora

Ispitanicima koji još nisu bili upoznati s pokretom pravedne trgovine i njezinom oznakom, objašnjeno je ukratko kako Fairtrade oznaka predstavlja oznaku za model međunarodne trgovine koja jamči poljoprivrednicima i radnicima u zemljama u razvoju adekvatne troškove za njihov rad,

točnije proizvođaču se plaća stvarna cijena proizvedenog proizvoda. Približeno im je da je naglasak na tome da ukoliko se kupac odluči za kupovinu proizvoda s ovom oznakom, podržava radnike i farmere iz zemalja u razvoju, njihov način da poboljšaju svoj život i život u njihovoj zajednici, te samim time smanji globalno siromaštvo i izrabljivanje ljudi. Na temelju ovakvog opisa tražilo se od ispitanika da Likertovom skalom od 1 do 5 pri čemu je 1 potpuno neslaganje, a 5 potpuno slaganje sa izjavom, da izraze svoj stav, odnosno mišljenje o tome imaju li povjerenja u ovakvu vrstu oznaka (Grafikon 6), te smatraju li ovu oznaku vjerodostojnom (Grafikon 7).

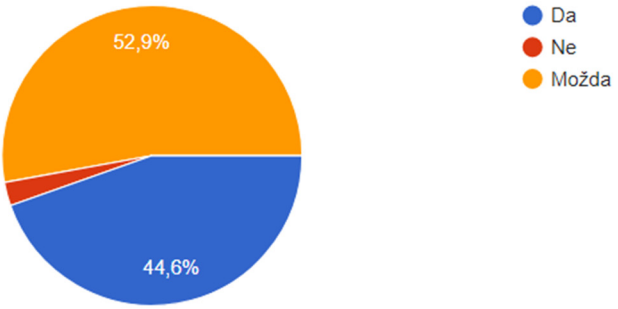


Grafikon 7. Rezultati istraživanja - smatraju li ispitanici ovu oznaku vjerodostojnom

Izvor: Izrada autora

Prema pitanju o povjerenju u oznaku čak 41,8% ispitanika odgovorilo je kako niti ima povjerenja niti nema, što predstavlja određenu ravnodušnost i nemaju neki preveliki stav o oznaci i samom sustavu pravedne trgovine bez obzira što je jasno napisano u opisu. Nadalje, s obzirom da je veći broj odgovora bio da ima povjerenja odnosno, izrazito vjeruje u taj način trgovine od onog malog postotka od 9,2% i 3,3% koji ne vjeruju odnosno ne vjeruju niti malo, može se reći kako bi samo malo više informiranosti o pokretu pravedne trgovine smanjilo broj nepovjerenja a povećalo postotak povjerenja.

S druge strane, na pitanje o vjerodostojnosti oznake, rezultati su se pokazali boljim nego na pitanju o povjerenju u oznaku. Veoma je mali broj onih koji ne vjeruju uopće i oni koji ne vjeruju, u postotku to je 2,6% i 6,5%, niži je postotak i onih koji su na sredini, dakle niti vjeruju niti ne vjeruju, dok je veći porast među onima koji smatraju kako je ova oznaka i koncept pravedne trgovine vjerodostojan sa 37,7% uz one koji u potpunosti vjeruju sa 19,5% ispitanika.



Grafikon 8. Rezultati istraživanja - hoće li se ispitanici odlučiti na kupovinu proizvoda sa Fair trade oznakom u prodavaonicama?

Izvor: Izrada autora

Na kraju upitnika, upitalo se ispitanike nakon što su saznali što je to koncept pravedne trgovine, kako ono funkcionira te što znači Fairtrade oznaka i gdje se ona nalazi, hoće li se odlučiti na kupovinu proizvoda (Grafikon 8) koji na svojoj ambalaži sadrže Fairtrade oznaku na što su odgovori bili iznenađujuće pozitivni. Čak 52,9% ispitanika odgovorilo je da će se možda odlučiti

na kupovinu takvih proizvoda, što naravno ne isključuje mogućnost odluke o kupovini kao i nekupovini, ali u slučaju da dođu do malo više informacija o samom sustavu pravedne trgovine, te da oni kupovinom tih proizvoda doprinose društvu i okolini, postoji mogućnost odabira kupovine tih proizvoda. S druge strane, veliki je broj onih koji su odgovorili da će kupiti proizvode sa Fairtrade oznakom, njih 44,6%, a samo 4 osobe od ukupnih 157, što iznosi 2,5% je odgovorilo da se neće odlučiti na kupovinu tih proizvoda. Svakako da je potrebno više motivacije od strane Fairtrade organizacije da na tržištima gdje već postoji proizvoda s njihovom oznakom preko medija, Interneta, obrazovnih institucija pokažu prednosti koje pruža ovaj koncept.

4. ZAKLJUČAK

Rezultati prijašnjih istraživanja pokazuju neznanje potrošača o konceptu pravedne trgovine te naglašavaju kako je potrebno više promocije o pravednoj trgovini te povećanju svijesti o odgovornijem ponašanju u međunarodnom trgovanju. Činjenica je kako pravedna trgovina može dobro utjecati na socijalnu egzistenciju, očuvanje okoliša, smanjenje globalnog siromaštva te povezivanje međunarodne trgovine.

Glavni cilj provedenog istraživanja bio je provjeriti znanje potrošača o pravednoj trgovini kao pojmu te poznavanju Fairtrade oznake na proizvodima koje mogu pronaći u prodavaonicama u Republici Hrvatskoj. Rezultati navode kako najveći broj ispitanika svoju kupovinu obavlja upravo u Lidlu, gdje se nalazi čak najveći broj proizvoda sa Fairtrade oznakom. Uz to, fakultet i Internet su glavna mjesta preko kojih su ispitanici čuli za ovaj pojam i njegovu svrhu pa se prema tome može zaključiti kako su to mjesta gdje bi se trebalo i dalje fokusirati na promoviranje pravedne trgovine i njezinih mogućnosti za boljitak u svijetu. Uključivanje koncepta pravedne trgovine u formalno obrazovanje na nižim razinama obrazovanja bi uvelike doprinijelo osvješćivanju mlađih generacija te utkalo put i budućnost pravednoj trgovini.

Nije iznenađujući rezultat da 78% ispitanika nije nikad kupilo proizvod s ovom oznakom, s obzirom da je 63% ispitanika odgovorilo kako niti ne zna što je to pravedna trgovina. Ovakvi rezultati mogu proizlaziti iz nepoznavanja prednosti koje koncept pravedne trgovine pruža, a s druge strane i iz nepovjerenja potrošača u sami koncept pravedne trgovine. Upravo zbog toga bi se trebalo više fokusirati na današnju moć tehnologije i Interneta te ga iskoristiti kao medij za promociju pravedne trgovine. Posebno velik potencijal u promoviranju proizvoda pravedne trgovine imaju trgovački lanci. Fairtrade organizacije trebaju prije svega, trgovačkim lancima pokazati sve dobrobiti ovog pokreta i što oni uvođenjem proizvoda s ovom oznakom čine za bolju budućnost. Trgovački lanci koji prodaju proizvode pravedne trgovine bi ih trebali značajnije promovirati s obzirom da imaju velik utjecaj na svoje lojalne kupce. Također, trebali bi educirati svoje kupce o konceptu pravedne trgovine te bolje istaknuti samu oznaku i upoznati kupce s njom.

Prema zaključcima istraživanja, populacija još nije dovoljno upućena u sve dobrobiti i mogućnosti koje pokret pravedne trgovine pruža, međutim ako se na globalnoj razini pokrenu određene aktivnosti koje će poboljšati čitav sustav i osvijestiti okolinu da je upravo to što svijetu treba, pravedna trgovina bi bila jedna od najčešćih poslovanja u budućnosti.

Ograničenja ovog istraživanja odnose se na nereprezentativan uzorak i činjenicu kako većinu uzorka čine mlađi ispitanici te se samim time istraživanje može promatrati kao indikativno. Buduća bi istraživanja trebala obuhvatiti uzorak cijele Hrvatske te bi, između ostaloga, bilo zanimljivo testirati potencijalne utjecajne faktore na namjeru kupovine proizvoda pravedne trgovine.

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Uloga savremene porodice u ekonomiji

Role of the Modern Family in Economy

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Djeca

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Modern family;
Economy;
Challenges;
Children

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Abstrakt: *Savremena porodica je uglavnom usvojila savremen naučni pogled na svijet, otvorena je prema društvu, njeni članovi su veoma aktivni u društvenom i ekonomskom životu i nastoje da usklade lične interese sa zajedničkim. Zasnivanje bračne zajednice vrši se na bazi uzajamne ljubavi, težnje za produžetkom vrste, vaspitavanjem djece i ostvarivanjem lične sreće. Karakteristike savremene porodice su: poznavanje savremene društvene stvarnosti, poznavanje ciljeva, zadataka i principa vaspitanja, nastojanje da se obezbede uslovi da se djete razvija prema svojim interesovanjima, snagama i sposobnostima. Savremena porodica teži da vaspitava svestrano obrazovanu i slobodnu ličnost; nastoji da kod svoje djece razvija pozitivna karakterna svojstva; osigura usklađivanje ličnih i društvenih interesa; teži da osposobi mlade za kreativnu djelatnost; stvara uslove da se mladi osposobe da u zrelo doba ponesu stvaralački dinamizam, vjeru u sopstvene snage, vjeru u ljude i život.*

Abstract: *The modern family has mostly adopted a modern scientific view of the world, is open to society, its members are very active in social and economic life and strive to harmonize personal interests with common interests. The establishment of a marriage union is based on mutual love, the desire for the extension of the species, the upbringing of children and the realization of personal happiness. The characteristics of the modern family are: knowledge of contemporary social reality, knowledge of goals, tasks and principles of education, efforts to ensure the conditions for the child to develop according to his interests, strengths and abilities. The modern family strives to raise an all-round educated and free personality; tries to develop positive character traits in his children; ensure alignment of personal and social interests; strives to equip young people for creative activity; creates the conditions for young people to be able to bring creative dynamism, faith in their own strength, faith in people and life.*

1. UVOD

Osnovni vid savremene porodice jeste radničko-službenička porodica. Ali ni ona ne predstavlja potpuno ujednačen tip porodice, jer razlike u njoj mogu biti osetne zavisno od stepena privrednog razvitka regiona u kojem porodica živi, veličine grada, kao i drugih faktora – visina prihoda porodice, stepen kvalifikacije članova zaposlenih, stepen kulture i obrazovanja, da li su oba supružnika zaposlena.

Zaključenje braka predstavlja stvar samih bračnih drugova koji se upoznaju pre ulaska u brak. Karakteristično je za savremenu porodicu da se stupanje u brak sve više odlaže. To je otežano činjenicom da mladi sve kasnije postižu ekonomsku samostalnost. Postepeno se menja odnos društva prema pojavi predbračnih veza i predbračnog života i time se omogućava uspešnije odabiranje bračnog druga. Žena postaje sve više slobodna, ravnopravni stvaralac, drug i prijatelj.

Važna odlika savremene porodice je da se u njoj neguje topla porodična atmosfera sa čvrstim emocionalnim vezama između roditelja i djece. U ovoj porodici, za razliku od patrijahalne, dete je glavni član kome se posvećuje maksimalna pažnja, pa je gotovo čitav porodični život podređen njemu. Polazi se od toga da je, u periodu detinjstva, detetu potrebno pružiti što više ljubavi,

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jer se to kasnije odražava na njegov život u zrelom periodu, na njegovu interakciju sa okruženjem, otvorenost prema drugima, na ljubav i razumevanje za drugoga. Zadovoljavanjem detetove potrebe za ljubavlju i nežnošću „razvija se kasnije osećanje sigurnosti, bezbednosti, prihvaćenosti i pripadnosti društvu. Iz ovih osećanja razvija se osećanje sopstvene ličnosti."

Ponašanje roditelja deci služi kao model kome ona teže da se približe illi da se njime poistovete. Zbog toga je međusobno uvažavanje, uzajamna pomoć i ljubav između supružnika i roditelja i djece, što je karakteristično za većinu savremenih porodica, važan podsticajni primer za mlado biće.

2. IZAZOVI PRED PORODICOM U SAVREMENOM EKONOMSKOM OKRUŽENJU

Kombinacija muža, žene i djece za koju 99,8 odsto ljudi u Sjedinjenim Državama veruje da čini porodicu - nije reprezentativna za 99,8 odsto porodica u SAD. Prema podacima popisa iz 2010. godine, samo 66 odsto djece mlađe od sedamnaest godina živi u domaćinstvu sa dva oženjena roditelja. Ovo je smanjenje sa 77 procenata u poređenju sa podacima iz 1980. godine (Bijedić & Bouillet, 2007).

Ova porodična struktura sa dva roditelja poznata je kao nuklearna porodica, što se odnosi na ožењene roditelje i djecu kao jezgro ili jezgro grupe. Poslednjih godina došlo je do porasta varijacija nuklearne porodice sa roditeljima koji nisu u braku. Tri posto djece živi sa dva vanbračna roditelja.

Više od jedne četvrtine djece u SAD živi u domaćinstvu sa jednim roditeljem (Chris, 1999).

2.1. Samohrani roditelji

Domaćinstva sa jednim roditeljem su u porastu. U 2010. godini 27 odsto djece je živelo samo sa samohranim roditeljem, u odnosu na 25 odsto u 2008. godini od tih 27 odsto, 23 odsto živi sa majkom, a tri odsto sa ocem. Deset procenata djece koja žive sa samohranom majkom i 20 procenata djece koja žive sa samohranim ocem također žive sa partnerom u zajedničkom životu svog roditelja (na primer, dečkom ili devojkom) (Darlon, 2007).

Očuh ili maćeha su dodatni porodični element u kućama sa dva roditelja. Među decom koja žive u dvoroditeljskim domaćinstvima, 9 odsto živi sa biološkim ili usvojiteljem i očuhom. Većina (70 odsto) te djece živi sa biološkom majkom i očuhom. Pokazalo se da struktura porodice varira u zavisnosti od uzrasta djeteta.

Starija djeca (petnaest do sedamnaest godina) imaju manje šanse da žive sa dva roditelja nego djeca adolescenta (šest do četrnaest godina) ili mala djeca (nula do pet godina). Starija djeca koja žive sa dva roditelja također imaju veće šanse da žive sa očuhom (Gidens, 2003).

U nekim porodičnim strukturama roditelj uopšte nije prisutan. U 2010. godini, tri miliona djece (4 procenta sve djece) živelo je sa starateljem koji im nije bio ni biološki ni usvojilac. Od ove djece, 54 odsto živi sa bakom i dedom, 21 odsto živi sa drugim rođacima, a 24 odsto živi sa nerođacima. Ova porodična struktura se naziva proširena porodica i može uključivati tetke, ujake i rođake koji žive u istom domu. Hranitelji čine oko četvrtinu nesrodnika.

Praksa da bake i dede nastupaju kao roditelji, bilo sami ili u kombinaciji sa roditeljem djeteta, postaje široko rasprostranjena u današnjim porodicama. Devet procenata sve djece živi sa

bakom i dedom, a u skoro polovini tih slučajeva baba i deda imaju primarnu odgovornost za djete (Livazović, 2012).

Baka i deda koji funkcionišu kao pružaoci primarne zdravstvene zaštite često su rezultat zloupotrebe droga, zatvaranja ili napuštanja roditelja. Događaji poput ovih mogu učiniti roditelje nesposobnim da se brinu o svom detetu. Promene u tradicionalnoj porodičnoj strukturi postavljaju pitanja o tome kako takve društvene promene utiču na djecu.

Statistika američkog popisa je pokazala da djeca koja žive u domovima sa oba roditelja odrastaju sa više finansijskih i obrazovnih prednosti od djece koja su odgajana u jednoroditeljskim kućama (James, 2000).

Čini se da je bračni status roditelja značajan pokazatelj napretka u životu djeteta. Djeca koja žive sa razvedenim roditeljem obično imaju više prednosti od djece koja žive sa roditeljem koji nikada nije bio u braku; ovo se posebno odnosi na djecu koja žive sa razvedenim očevima. Ovo je u korelaciji sa statistikom da su roditelji koji nikada nisu bili u braku obično mlađi, imaju manje godina školovanja i niže prihode.

Šest od desetoro djece koja žive samo sa majkom živi blizu ili ispod nivoa siromaštva. Od onih koje odgajaju samohrane majke, 69 procenata živi u siromaštvu ili blizu njega u poređenju sa 45 procenata za razvedene majke (Mužić, 1982).

Iako drugi faktori kao što su starost i obrazovanje igraju ulogu u ovim razlikama, može se zaključiti da je brak između roditelja generalno koristan za djecu.

2.2. Zajednički život

Zajednički život pre ili umjesto braka je sve veća opcija za mnoge parove. Kohabitaciju, kada muškarac i žena žive zajedno bez braka, praktikovalo je oko 7,5 miliona ljudi (11,5 procenata stanovništva) 2011. godine, što pokazuje porast od 13 procenata od 2009. godine (Miliša & Tolić, 2010).

Ovaj porast kohabitacije vjerovatno je posledica smanjenja društvene stigme koja se odnosi na ovu praksu. U istraživanju Nacionalnog centra za zdravstvenu statistiku iz 2010. godine, samo 38 procenata uzorka od 13.000 osoba smatralo je da kohabitacija negativno utiče na društvo. Od onih koji žive u vanbračnoj zajednici, većina su ne-Hispani, bez diplome srednje škole ili osobe odrasle u jednoroditeljskom domaćinstvu. Parovi u kohabitciji (suživotu) mogu odlučiti da žive zajedno u nastojanju da provedu više vremena zajedno ili da uštede novac na životnim troškovima. Mnogi parovi gledaju na kohabitaciju kao na „probu“ za brak. Danas je oko 28 odsto muškaraca i žena živelo u suživotu pre prvog braka. Poređenja radi, 18 procenata muškaraca i 23 procenta žena venčalo se bez ikakvog zajedničkog života (Pies, 2009).

Velika većina kohabitacijskih veza na kraju rezultira brakom; samo 15 odsto muškaraca i žena živi samo u zajedničkom životu i ne stupa u brak. Otprilike polovina kohabitatora prelazi u brak u roku od tri godine. Iako parovi mogu da iskoriste ovo vreme da „razreše probleme“ u vezi pre nego što se venčaju, najnovije istraživanje je pokazalo da kohabitacija ima mali uticaj na uspeh braka. U stvari, oni koji ne žive zajedno pre braka imaju nešto bolje stope da ostanu u braku duže od deset godina (Ivković, 2003).

Kohabitacija može doprineti povećanju broja muškaraca i žena koji odlažu brak. Srednja starost za stupanje u brak je najviša od kada je popis stanovništva u SAD vodio evidenciju - dvadeset šest godina za žene i dvadeset osam godina za muškarce.

2.3. Istopolni parovi

Broj istopolnih parova je značajno porastao u poslednjoj djeceniji. Američki biro za popis stanovništva prijavio je 594.000 domaćinstava istopolnih parova u Sjedinjenim Državama, što je povećanje od 50 procenata u odnosu na 2000. godinu. Ovo povećanje je rezultat većeg broja veza, sve većeg društvenog prihvatanja homoseksualizma i naknadnog povećanja spremnosti da se to prijavi.

Na nacionalnom nivou, domaćinstva istopolnih parova čine 1 procenat stanovništva, u rasponu od samo 0,29 procenata u Vajomingu do 4,01 procenata u okrugu Kolumbija (Vukov, i sar. ,1994).

Pravno priznanje istopolnih parova kao supružnika je različito u svakoj državi, pošto su samo šest država i Distrikt Kolumbija legalizovali istopolne brakove. Međutim, američki popis stanovništva iz 2010. dozvolio je istopolnim parovima da se prijave kao supružnici bez obzira na to da li njihova država zakonski priznaje njihovu vezu.

Na nacionalnom nivou, 25 odsto svih istopolnih domaćinstava izjavilo je da su supružnici. U državama u kojima se sklapaju istopolni brakovi, skoro polovina (42,4 odsto) domaćinstava istopolnih parova prijavljena je kao supružnici.

Što se tiče demografije, istopolni parovi se ne razlikuju mnogo od parova suprotnog pola. Domaćinstva istopolnih parova imaju prosečnu starost od 52 godine i prosečni prihod domaćinstva od 91.558 dolara; domaćinstva parova suprotnog pola imaju prosečnu starost od 59 godina i prosečni prihod domaćinstva od 95.075 dolara. Pored toga, 31 odsto istopolnih parova podiže djecu, nedaleko od 43 odsto parova suprotnog pola (Pjurkovska-Petrović, 1990).

Od djece u domaćinstvima istopolnih parova, 73 procenta su biološka djeca (samo jednog od roditelja), 21 procenat je samo usvojeno, a 6 procenata je kombinacija biološke i usvojene djece .

Iako postoji određena zabrinutost društveno konzervativnih grupa u pogledu dobrobiti djece koja odrastaju u istopolnim domaćinstvima, istraživanja pokazuju da su roditelji istog pola podjednako efikasni kao i roditelji suprotnog pola. U analizi 81 roditeljske studije, sociolozi nisu pronašli nikakve kvantificirane podatke koji bi podržali ideju da je roditeljstvo suprotnog pola bolje od istopolnog roditeljstva. Međutim, pokazalo se da djeca lezbejskih parova imaju nešto niže stope problema u ponašanju i višu stopu samopoštovanja.

2.4. Ostati samac

Gej ili strejt, nova opcija za mnoge ljude u Sjedinjenim Državama je jednostavno ostati samac. Godine 2010. u Sjedinjenim Državama je bilo 99,6 miliona neoženjenih osoba starijih od osamnaest godina, što je činilo 44 procenta ukupnog odraslog stanovništva . U 2010. godini, osobe koje nisu bile u braku u starosnoj grupi od dvadeset pet do dvadeset devet činile su 62 procenta žena i 48 procenata muškaraca, u odnosu na 11 procenata i 19 procenata, respektivno, 1970. godine.

Neudate ili nikad oženjeni pojedinci se nalaze u većoj koncentraciji u velikim gradovima ili metropolitanskim oblastima, pri čemu je Njujork jedan od najvećih (Ivković, 2003).

Iako i samci i neudate žene navode društveni pritisak da stupe u brak, žene su podložne većoj kontroli. Neudate žene se često prikazuju kao nesrećne „usidjelice" ili „stare sluškinje" koje ne mogu naći muškarca da se uda za njih. S druge strane, samci se obično prikazuju kao neženja koja ne mogu da se smire ili jednostavno „nisu pronašli pravu devojku". Neudate žene navode da se osećaju nesigurno i raseljeno u svojim porodicama kada se njihov status omalovažava (Vukov i sar., 1994).

Međutim, neudate žene starije od trideset pet godina navode da se osećaju sigurno i srećno zbog svog statusa van braka, jer su mnoge žene u ovoj kategoriji uspele u svom obrazovanju i karijeri. Generalno, žene se osećaju nezavisnije i spremnije da žive veliki deo svog odraslog života bez supružnika ili partnera u porodici nego što su to činile 1960-ih.

Odluka da se venčate ili ne venčate može biti zasnovana na različitim faktorima uključujući religiju i kulturna očekivanja. Najveća je vjerovatnoća da će se venčati Azijati, dok je najmanja vjerovatnoća da će se venčati Afroamerikanci. Pored toga, vjerovatnije je da će pojedinci koji ne pridaju nikakvu vrijednost religiji biti neoženjeni od onih koji religiju pridaju visokoj vrijednosti. Uopšteno govoreći, biti samac nije odbijanje braka; nego je to stil života koji ne uključuje obavezno brak. Do četrdesete godine, prema popisnim podacima, 20 procenata žena i 14 muškaraca nikada se neće venčati.

3. METODOLOGIJA ISTRAŽIVANJA

3.1. Predmet istraživanja

Predmet ovog istraživačkog rada je empirijska analiza i prezentacija istraživanja na temu savremeni porodični izazovi u današnjoj ekonomiji i njihovi uticaji na narušavanje pravih porodičnih vrijednosti.

3.2. Cilj istraživanja

Cilj ovoga istraživačkog rada je obrada, analiza i prezentacija dobivenih rezultata u istraživanju pojma porodice i savremenosti.

3.3. Zadaci istraživanja

Zadaci empirijskog istraživanja su:

1. Istražiti, analizirati i predstaviti savremeno ekonomsko doba koje ostavlja posledice na porodicu;
2. Utvrditi da savremena porodica podrazumeva demokratiju među članovima porodice;
3. Istražiti, analizirati i predstaviti da su djeca slobodnija u savremenoj porodici;
4. Istražiti, analizirati i predstaviti da roditelji više razgovaraju sa svojom djecom u savremenoj porodici nego što je to bio običaj u patrijahalnoj porodici;
5. Utvrditi kako savremena porodica treba imat i ograničenja kako bi sačuvala prave porodične vrijednosti;

6. Istražiti, analizirati i predstaviti da otac i majka imaju i dalje glavnu riječ iako su savremena porodica;
7. Istražiti, analizirati i predstaviti da savremena porodica treba imati i elemente patrijalne porodice;
8. Utvrditi i pokazati da moderno ekonomsko doba ugrožava porodicu;
9. Istražiti, analizirati i predstaviti da savremene tehnologije i praćenje društvenih mreža su izazov više i pretnja savremenoj porodici, i predstavlja otežavajuće okolnosti u vaspitanju djece;
10. Istražiti i predstaviti da savremena porodica ima više pozitivnih nego negativnih posledica na vaspitanje djece.

3.4. Hipoteze istraživanja

Glavna hipoteza

Osnovna hipoteza istraživanja glasi *„Savremeni porodični izazovi neće ugroziti pravu porodičnu vrijednost“.*

Pomoćne hipoteze

Glavnu hipotezu je potrebno konkretizovati sa nekoliko pomoćnih hipoteza, a to su:
- Savremeno doba ostavlja posledice na porodicu.
- Savremena porodica podrazumeva demokratiju među članovima porodice.
- Djeca su slobodnija u savremenoj porodici.
- Roditelji vise razgovaraju sa svojom djecom u savremenoj porodici nego što je to bio običaj u patrijahalnoj porodici.
- Savremena porodica treba imat i ograničenja kako bi sačuvala prave porodične vrijednosti.
- Otac i majka imaju i dalje glavnu riječ iako su savremena porodica.
- Savremena porodica treba imati i elemente patrijalne porodice.
- Moderno doba ugrožava porodicu.
- Savremene tehnologije i praćenje društvenih mreža su izazov više i pretnja savremenoj porodici, i predstavlja otežavajuće okolnosti u vaspitanju djece.
- Savremena porodica ima više pozitivnih nego negativnih posledica na vaspitanje djece.

3.5. Metode u istraživanju

Metoda (grč. *methodos* - način ili put traženja) je svaki postupak čija primjena omogućava ostvarenje određenog cilja, u užem smislu, misaoni i praktični postupak koji omogućava da se dođe do znanja o predmetu istraživanja. Naučni metod je složen sistematski proces kojim se dolazi do zadovoljavajućeg objašnjenja ispitivanih pojava, njegova primjena zahtjeva upotrebu raznih posebnih metoda istraživanja: promatranje, mjerenje, eksperiment, upoređivanje.

U ovom istraživanju korišteno je nekoliko metoda:
- metoda teorijske analize,
- metoda analize pedagoške dokumentacije,
- deskriptivno-analitička metoda i
- servey metoda.

4. REZULTATI ISTRAŽIVANJA

U istraživanju učestvovalo je 36 učitelja iz Rožaja. Izračunata aritmetička sredina (M) svih indikatora od 4,51 pokazuje da savremeno doba ostavlja posledice na porodicu, po procjeni ispitanika (Tabela 1). Vrijednost standardne devijacije (SD) od 0,56 ukazuje da je rasipanje oko aritmetičke sredine veoma malo, što potvrđuje i koeficijent varijabilnosti (CV) od 12,42, a time i veoma dobru homogenost dobivenih rezultata za ovaj uzorak ispitanika.

Tabela 1. Mjere centralne tendencije, varijabilnosti i distribucije frekvencije obilježja

				1	2	3	4	5
Parametri	N	M	SD	%	%	%	%	%
Savremeno doba ostavlja posledice na porodicu	36	4,58	,50	0,00	0,00	0,00	41,70	58,30
Savremena porodica podrazumeva demokratiju među članovima porodice	36	4,64	,49	0,00	0,00	0,00	36,10	63,90
Djeca su slobodnija u savremenoj porodici	36	4,31	,67	0,00	0,00	11,10	47,20	41,70
Roditelji više razgovaraju sa svojom djecom u savremenoj porodici nego ***što*** je to bio običaj u patrijahalnoj porodici	36	4,58	,50	0,00	0,00	0,00	41,70	58,30
Savremena porodica treba imat i ograničenja kako bi sačuvala prave porodične vrijednosti	36	4,50	,66	0,00	2,80	0,00	41,70	55,60
Otac i majka imaju i dalje glavnu riječ iako su savremena porodica	36	4,53	,51	0,00	0,00	0,00	47,20	52,80
Savremena porodica treba imati i elemente patrijalne porodice	36	4,44	,50	0,00	0,00	0,00	55,60	44,40
Moderno doba ugrožava porodicu	36	4,56	,56	0,00	0,00	2,80	38,90	58,30
Savremene tehnologije i praćenje društvenih mreža su izazov više i pretnja savremenoj porodici, i predstavlja otežavajuće okolnosti u vaspitanju djece	36	4,61	,49	0,00	0,00	0,00	38,90	61,10
Savremena porodica ima više pozitivnih nego negativnih posledica na vaspitanje djece	36	4,31	,67	0,00	0,00	11,10	47,20	41,70

Napomena: N-ukupan broj ispitanika; M-aritmetička sredina; SD- standardna devijacija

Izvor: Samostalna izrada autora

Analizom dobivenih rezultata (Tabela 1) vidimo da se ispitanici u potpunosti slažu da savremena porodica podrazumijeva demokratiju među članovima porodice. Ispitanici se potpuno slažu da roditelji više razgovaraju sa svojom djecom u savremenoj porodici nego što je to bio običaj u patrijahalnoj porodici. Učitelji se slažu i potpuno slažu da savremena porodica treba imat i ograničenja kako bi sačuvala prave porodične vrijednosti. Moderno doba ugrožava porodicu. Savremena porodica ima više pozitivnih nego negativnih posledica na vaspitanje djece .

Analizom dobivenih rezultata zaključujemo da je potvrđena osnovna hipoteza istraživanja da *„Savremeni porodični izazovi neće ugroziti pravu porodičnu vrijednost“.*

5. ZAKLJUČAK

U savremenim teorijama vaspitanja naglašava se pedagoški značaj svesnog, aktivnog i kritičkog usvajanja znanja i njegove neposredne primene u praksi. Sam proces usvajanja znanja iskazuje pedagoški najvrednije mogućnosti razvijanja intelektualnih sposobnosti, posebno mišljenja.

Umesto usvajanja velike količine znanja (obilje podataka, detalja, činjenica informacija), process sticanja znanja treba da bude usmeren na formiranje i razumevanje suštinskih pojmova,

relacija, principa, strukture i razvoja pojava koje se proučavaju. Veliki broj činjenica i njihovo memorisanje u sve većoj meri ustupaju mesto sadržajima pomoću kojih učenici mogu potpunije da uoče, shvate i usvoje osnovne principe i zakonitosti nastanka i razvoja fenomena koje proučavaju, njihovu međusobnu uslovljenost, povezanost i dijalektičnost.

Pojedincu su sve neophodnija znanja putem kojih može da dobije celovitije odgovore na bitna pitanja-suštine-međusobnog-odnosa razvoja prirode i društva čoveka, proizvodnje, tehnike, tehologije, ekonomije, polituke, nauke umetnosti i kulture.

Usvojena znanja i vrednosti proširuju čovekova saznanja, produbljuju poimanje sveta i stvaraju nove osnove za dalje obrazovanje i razvoj sposobnosti. O ogromnoj ulozi znanja i razvoju sposobnosti u upoznavanju sveta najilustrovanije govori Brunerovo shvatanje smisla obrazovanja: ”*Cilj obrazovanja je formiranje mišljenja da bi se upoznao svet i njegovi zakoni*”.

Svesno i kritički usvojena znanja omogućuju pojedincu da na filozofski način (racionalan, kritički) promišlja svet i svoju poziciju u njemu. Od škole se očekuje da mladima pomogne u izgrađivanju kritičkog i aktivnog odnosa prema svetu i usvajanju univerzalnih kulturnih, radnih-moralnih-naučnih i pravnih, ekonomskih, estetskih i drugih vrednosti savremenog društva.

U procesu vaspitanja mladi treba da steknu znanja koja će im pomoći da bolje upoznaju sebe, svoje potrebe i motive, sposobnosti, mogućnosti i ograničenja. To je preduslov da lakše i potpunije ovladaju sredstvima samorazvoja, samousavršavanja i samorealizacije. Znanje postaje sve moćnije sredstvo razvoja i humanizovanja čoveka i sveta. Zato je sasvim prihvatljiva i inspirativna misao B. Rasla:”*Izgubiti veru u znanje, znači izgubiti veru u najveću sposobnost čoveka”.*

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Specifičnosti i doseg kružnih prijevara

Distinctive Features and Scope of Carousel Frauds

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Ključne reči:
Porez na dodanu vrijednost;
Pretporez;
Porezna utaja;
Prijenos porezne obveze;
Porezna uprava;
Međunarodna suradnja;
Buffer

Keywords:
Value added tax;
Input VAT;
Tax evasion;
Reverse charge;
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International cooperation;
Buffer

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Sažetak: *Jedna od glavnih karakteristika kružnih prijevara odnosi se na oporezivanje „nultom stopom" poreza na dodanu vrijednost kod stjecanja dobara unutar Europske unije, odnosno na obvezu obračunavanja i plaćanja poreza na dodanu vrijednost prilikom stjecanja dobara i prava na odbijanje istog iznosa na ime pretporeza. Iz tog je razloga porezni obveznik, prilikom iduće prodaje istog dobra, u mogućnosti naplatiti porez na dodanu vrijednost u svojim prodajama i „nestati" bez njegove prijave nadležnom poreznom tijelu. Idući porezni obveznik od poreznog tijela traži povrat tog istog poreza koji prethodni porezni obveznik nije uplatio u državni proračun čime čini kazneno djelo porezne utaje, koje je ujedno i predikatno djelo pranja novca. Provođenjem transakcija u okviru kružnih prijevara ostvaruje se prihod pogodan za daljnji proces pranja novca, iako je pranje novca moguće i kroz sam proces kružnih prijevara.*

Abstract: *One of the main characteristics of carousel fraud relates to "zero-rate" VAT system on intra-community trade regarding the obligation to collect and pay VAT on the acquisition of goods and the right to deduct the same amount as input VAT. Therefore, at the next sale of the same good, the taxpayer can collect VAT and "disappear" without remitting the collected tax. The next taxpayer demands from the tax authority the refund of the same VAT that the previous taxpayer did not pay to the state budget, thus committing the criminal offense of tax evasion which is a predicate offense of money laundering. The conduction of transactions within the framework of carousel fraud generates income suitable for the further process of money laundering, although money laundering is possible through the process of carousel fraud as well.*

1. UVOD

Zbog specifičnosti oporezivanja prometa u međunarodnim transakcijama, od važnosti je nacionalno zakonsko uređenje oporezivanja porezom na dodanu vrijednost (u nastavku: PDV), izbjegavajući dvostruko oporezivanje ili poreznu evaziju. Rješenje se nalazi u odabiru modela oporezivanja prema načelu odredišta ili načelu podrijetla (Jelčić *et al*., 2008, str. 408-409). U međunarodnim se okvirima primjenjuje prijelazni sustav oporezivanja prema kojem se transakcije unutar Europske unije (u nastavku: EU) oporezuju u državi članici odredišta, sukladno nacionalnom zakonodavstvu.

Način oporezivanja prometa u različitim jurisdikcijama unutar EU-a ukazuje na ranjivost sustava kada je riječ o prijevarama i utajama, što je našlo potporu u postojećim modelima oporezivanja prometa, primjeni načela odredišta pri oporezivanju prometa unutar EU-a, nedostatku jedinstvene pravne podloge (ukidanje granične kontrole) te nepotpunoj i neučinkovitoj suradnji poreznih, policijskih i sudskih tijela na razini pojedinih članica i EU-a (Pashev, 2007, str. 490-501).

Prijevare specifične za sustav PDV-a mogu se podijeliti u dvije kategorije, ovisno o tome radi li se o nezakonitom smanjenju porezne obveze (porezna utaja) ili prisvajanju PDV-a (od nezakonitog

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povrata) ili o oba oblika istodobno (Fedeli & Forte, 2011, str. 143-166). Druga se klasifikacija temelji na kompleksnosti odabranog modela: jesu li u prijevaru uključeni domaći ili međunarodni sudionici te je li riječ o pojedinačnoj operaciji ili slijedu lažnih transakcija. Utaja i nezakonito prisvajanje PDV-a pojavljuju se u različitim oblicima, poput podcjenjivanja vrijednosti ulaznih proizvodnih čimbenika i precjenjivanja vrijednosti dovršene proizvodnje, lažnog razvrstavanja dobara kako bi se iskoristila snižena porezna stopa, deklariranja netočnih količina dobara, lažnih računa ili njihova izostanka te krijumčarenja, što se u cjelini događa u sivoj ekonomiji (Bejaković, 2016, str. 99-100).

2. OSNOVNE ODLIKE KRUŽNE PRIJEVARE

Kao jedna od najznačajnijih vrsta prijevara unutar sustava PDV-a smatra se „kružna" ili „vrtuljak prijevara", odnosno jedna od podvrsta prijevara „nestajućeg trgovca" (engl. *MTIC fraud*, u nastavku: MTIC prijevara). Neki izvori procjenjuju izravnu štetu koju godišnje prouzroče kružne prijevare na 100 milijardi eura (Buterin, Blašković & Ribarić Aidone, 2014, str. 91), dok iz Rezolucije Europskog parlamenta (2016/2033(INI)) proizlazi da je ta šteta procijenjena na 45 - 53 milijarde eura godišnje (ukupni gubitak prihoda od PDV-a prouzročen prijevarama iznosi oko 170 milijardi eura godišnje).

MTIC prijevara uključuje transakcije između (najmanje) dviju država članica, veći broj (stvarnih ili lažnih, *op. a.*) transakcija i više poreznih obveznika u kratkom razdoblju, radi prikrivanja stvarnih namjera najmanje jednog nestajućeg trgovca (Raspudić, 2004, str. 67). Kretanjem dobara i usluga između dviju država članica EU-a koriste se prednosti „nultog oporezivanja" pri čemu stjecatelj (načelo odredišta) taj porez ne plaća, ali ga istovremeno obračunava i naplaćuje od kupca (poreznog obveznika) u daljnjoj prodaji. Nakon toga, zajedno s naplaćenim PDV-om nestaje, bez uplate tog istog PDV-a nadležnom poreznom tijelu.

Provođenjem kružne prijevare lanac kupnje i prodaje se nastavlja, a svaki idući porezni obveznik u nizu (*buffer*) koristi pravo na odbitak pretporeza u kupnjama i naplaćuje PDV pri prodajama. Što je veći broj poreznih obveznika (svjesno ili nesvjesno) uvučenih u prijevaru, manja je vjerojatnost i duže razdoblje potrebno poreznom tijelu da je otkrije. *Bufferi* mogu biti potpuno nesvjesni da su dio lanca prijevare, ali zbog određenih nepravilnosti transakcija mogu imati razlog za sumnju, iako najčešće bez izravnog saznanja o prijevarnim postupanjima (Ainsworth, 2006, str. 444). Načelo dobre vjere nije zahtjev poreznim obveznicima u pogledu rezultata, već pretpostavlja ulaganje truda ovisno o okolnostima slučaja. Međutim, ne može se zahtijevati od poreznih obveznika provođenje kontrola za koje su uobičajeno zadužena porezna tijela. U većini slučajeva u postupku pred Sudom Europske unije činjenica da porezni obveznik nije znao ili nije mogao znati da je njegova transakcija dio prijevare dopušta mu da zadrži pravo na odbitak ili izuzeće. Po potrebi, to pravo bi mu se čak moglo priznati i da se nisu stekli materijalni uvjeti za njegov nastanak. Stoga načelo dobre vjere dopušta poreznom obvezniku pravičnu raspodjelu rizika utaje između porezne administracije i poreznih obveznika, kao i između različitih strana transakcije (Szpunara, 2014).

Dobra se najčešće vraćaju u zemlju podrijetla i prodaju poreznom obvezniku koji je bio prvi u nizu ili se njima započinje novi lanac kružne prijevare. Rijetko će takva dobra doći do maloprodaje na domaćem tržištu, što govori o naravi ove vrste prijevare. Prodaja dobara može biti i fiktivna, što je vrlo teško utvrditi zbog slobode kretanja dobara unutar EU-a i, nastavno, nepostojanja granica na kojima bi se provela stvarna kontrola dobara pri prelasku iz jedne u drugu državu članicu. U tom je slučaju cijela vrtuljak prijevara virtualna, osim zahtjeva za povrat pretporeza koji je realan, kao i milioni utajenih eura (Ainsworth, 2013, str. 2).

Prije desetak godina sheme vrtuljak prijevara uključivale su uglavnom dobra visoke vrijednosti, ali malog opsega kao što su mobilni telefoni, računalni čipovi, mikroprocesori, *hi-fi* oprema, nova i rabljena vozila te plemeniti metali. Međutim, posljednjih godina sheme takvih prijevara uključuju i nematerijalne proizvode kao što su certifikati za emisiju ugljika, plin i električna energija, informatičke usluge u „oblaku" i VoIP te certifikati za zelenu energiju. Prema podatcima *Europol*-a, prijevare u okviru sustava PDV-a pri trgovanju emisijama ugljika prouzročile su gubitak od oko pet milijardi eura u razdoblju 2009.-2010. (Branger, Lecuyer & Quirion, 2015, str. 12).

Novi obrazac se može objasniti mogućnošću prijenosa nematerijalnih proizvoda velikom brzinom i poteškoćama u praćenju takvih transakcija (Frunza, 2013, str. 223). U cilju otežane sljedivosti, vrtuljak prijevara može uključivati i jeftinija dobra poput osnovnih prehrambenih proizvoda (npr. ulje, šećer, kava itd.) koji se konzumiraju brzo i u velikim količinama, zbog čega im je izuzetno teško ući u trag (Hangacova & Stremy, 2018, str. 136). Statistika ukazuje da su kriminalne skupine sklone ponašati se „oportunistički" te pratiti razvoj gospodarstva i dinamiku rasta potražnje za određenim dobrima (Lamensch, 2018, str. 17). Zajedničke karakteristike proizvoda podložnih vrtuljak prijevarama su mali obujam, velika vrijednost i laka dostupnost u velikim količinama. Iz navedenog proizlazi da predmet prijevara nisu nužno samo dobra, već mogu biti i usluge.

Kriminalne skupine koje sudjeluju ili organiziraju kružne prijevare ne natječu se jedne protiv drugih. Inicijalna ideja prijevare je kruženje dobara što je moguće više puta, pri čemu državni proračun ostaje bez uplate iznosa dužnog poreza. Dobra se prodaju samo unutar osmišljenog „vrtuljka", vrlo brzo i po najvišoj mogućoj cijeni zbog toga što viša cijena povlači za sobom i veći iznos PDV-a (FATF, 2007, str. 3). Tako složeni sustav zahtijeva usku suradnju sudionika prijevare, ali i uvlačenje drugih poreznih obveznika (*buffera*) koji će prijevari dati dodatnu legitimnost.

3. PREVENIRANJE KRUŽNIH PRIJEVARA

Jedan od načina rješavanja fenomena PDV prijevara predstavljaju strukturalne promjene sustava oporezivanja. U tom cilju Vijeće EU-a može ovlastiti svaku državu članicu za uvođenje posebnih mjera koje odstupaju od odredaba Direktive 2006/112/EZ o zajedničkom sustavu PDV-a kako bi se pojednostavio postupak naplate PDV-a i spriječila porezna utaja ili izbjegavanje plaćanja poreza. Radi zaustavljanja i suzbijanja utvrđenog trenda rasta prijevara i stvaranja znatnih proračunskih gubitaka, Vijeće EU-a je, kao najznačajnije, donijelo sljedeće dokumente: Direktivu 2018/2057, Direktivu 2020/284, Uredbu 904/2010 i Uredbu Vijeća 2020/283.

Početkom 21. stoljeća uznapredovala informatizacija potiče prve MTIC prijevare u vezi transakcija s dobrima malog obujma, velike vrijednosti i dostupnosti u velikim količinama. Isti pojavni oblici nalaze se i u transakcijama s uslugama (trgovina ugljikom i VoIP). S obzirom da se u ovom slučaju tehnologija smatra uzročnikom MTIC prijevara, ona se može koristiti i kao učinkovita protumjera. Od različitih tehnoloških mogućnosti njihova sprječavanja, ističu se tri najučestalija: *VAT locator number* (u nastavku: VLN), *digital VAT* (u nastavku: D-VAT) i *Real time VAT* (u nastavku: RTvat).

VLN je lako prilagodljiv PDV sustavu, a predstavlja ciljanu i racionalnu metodu rješavanja problema MTIC i MTEC (engl. *missing trader extra-community*) prijevara. Jedna od najvažnijih

karakteristika VLN-a je nepriznavanje pretporeza onom poreznom obvezniku čiji je isporučitelj na računu imao nevažeći VLN. Svaki porezni obveznik u lancu ima svoj VLN, a numerički slijed prati dobra ili usluge od početne faze proizvodnje do finalne potrošnje. Sigurnosna kopija VLN sustava može se osigurati putem Interneta ili pozivnog centra (Ainsworth, 2010, str. 1-2). Sličan modalitet se primjenjuje u Quebecu gdje je postavljen zaštitni sustav Zappers (Rootman & Krüger, 2020) u slučaju krivotvorenja podataka pri isporukama dobara i usluga. Dođe li do prekida u slijedu VLN broja, poreznom obvezniku koji slijedi u lancu prosljeđuje se informacija o obvezi plaćanja PDV-a. Na taj se način poreznog obveznika obvezuje na pribavljanje VLN broja koji će mu omogućiti daljnju prodaju dobara, čime se MTIC prijevara onemogućava u korijenu (Cindori & Zakarija, 2016, str. 83-84).

MTIC prijevara se može eliminirati i primjenom certificiranog poreznog programa, uz odgovarajuće promjene zakonskog okvira obračuna PDV-a. Takav je program sličan VLN sustavu jer omogućuje praćenje obračuna PDV-a. Osim što pomaže utvrđivanju točnog iznosa PDV-a za svaku transakciju, omogućuje i povezivanje pretporeza primatelja s obračunatim iznosom PDV-a isporučitelja, kao i točnost u popunjavanju PDV prijave (Ainsworth, 2006, str. 214). Korištenje ovog načina trebalo bi biti alternativno, ali u određenim slučajevima u kojima se trguje visokorizičnim dobrima ili uslugama kao dijelom transakcija MTIC prijevare (kao što su dozvole za trgovinu ugljikom, VoIP, mobiteli ili računalni čipovi) može se učiniti i obligatornim.

RTvat je programsko rješenje koje omogućava praćenje oporezivanja od datuma računa do datuma plaćanja za isporuke dobara. Primjenjiv je pri kartičnom plaćanju na način da se iznos PDV-a automatski preusmjerava s bankovnog računa u državni proračun, bez obveze prijavljivanja PDV-a od strane isporučitelja. Primjena ovog sustava zahtijeva strukturne promjene i proceduralne prilagodbe u smislu promjene načina obračuna PDV-a i obračun PDV-a prema načelu podrijetla. Međutim, RTvat može biti konstruiran i na načelu odredišta jer određeni broj država izvan EU-a primjenjuje pravila vrlo slična RTvat sustavu, iako su primjenjiva samo pri plaćanju kreditnim/debitnim karticama. (Ainsworth, 2011, str. 10).

Unatoč ciljanim mjerama prevencije kružnih prijevara, krajnjim ciljem smatra se uvođenje jedinstvenog sustava PDV-a na razini država članica. Postojeći sustav PDV-a koji se u Europskoj uniji primjenjuje od 1993. zamišljen je kao prijelazni sustav, dok bi se oporezivanje na načelu podrijetla trebalo, prema čl. 402. Direktive 2006/112/EZ, primjenjivati kao konačni sustav. Međutim, Europska komisija se ipak zalaže za uvođenje konačnog sustava PDV-a prema načelu odredišta (Cindori, Pilipović & Kalčić, 2021, str. 58), čime se sve više udaljava od prvobitne ideje. U cilju provedbe konačnog sustava PDV-a, a sukladno rezoluciji Europskog parlamenta (2016/2033(INI)), potrebno je, prije svega, političko vodstvo za uklanjanje duboko ukorijenjenih prepreka ranijem napretku te za konačno donošenje reformi potrebnih za suzbijanje prijevara, uklanjanje administrativnih prepreka i smanjenje regulatornih troškova u cilju pojednostavljenja poslovanja trgovačkih društava na razini EU-a.

4. NASTOJANJA REPUBLIKE HRVATSKE U BORBI PROTIV KRUŽNIH PRIJEVARA

Ministarstvo financija Republike Hrvatske prepoznalo je problem organiziranih poreznih prijevara i poduzelo preventivne korake osnivanjem Samostalnog sektora za otkrivanje poreznih prijevara donošenjem Uredbe o unutarnjem ustrojstvu Ministarstva financija. Taj sektor predstavlja središnju nacionalnu jedinicu za prikupljanje, kontrolu, analitičku obradu i razmjenu podataka unutar Ministarstva financija. Uzajamna suradnja i njegovo postupanje pretpostavlja

učinkovito sprječavanje i suzbijanje prijevara te onemogućavanje izravne štete za proračun i tržište. Od ulaska Republike Hrvatske u EU Porezna uprava je, temeljem međunarodne razmjene informacija (*Eurofisc* i SCAC), uspjela ukloniti dio nestajućih trgovaca (MTIC prijevare) ukidanjem PDV ID-a kako bi spriječila daljnju štetu za proračun.

Uz potporu Središnjeg ureda Porezne uprave - Službe za međunarodnu razmjenu informacija i kontakt osoba u CLO (*Central Liaison Office*) pri područnim uredima, uspješno se provodi razmjena informacija u vezi s prijevarama. Informacije dobivene putem obrazaca SCAC i *Eurofisc* idu u prilog razvoju softverskog alata Porezne uprave koji bi omogućio sveobuhvatnu, sustavnu analizu rizika. CRMS (*Compliance Risk Management System*), odnosno Sustav za upravljanje rizicima, jedan je od najpoznatijih i najčešće rabljenih alata za ovladavanje i upravljanje rizicima. Riječ je o automatiziranom računalnom rješenju prilagođenom poslovnom korisniku koji se dodjeljuje prema određenim skupinama pravila i portfelju subjekta radi ocjene rizičnosti. Ukupan financijski sektor često se oslanja, sukladno pravilima i kriterijima upravljanja te aktivnom portfelju, upravo na ocjene rizičnosti svakoga plasmana. Uvođenje cjelovite analize i upravljanja rizikom na svim razinama podrazumijeva i uvođenje jednoobraznosti u procesima rada kako bi se na najmanje razmjere svelo odstupanje od usklađenog ponašanja (Škeva & Ramljak, 2015, str. 36, 43-44).

5. POVEZANOST KRUŽNIH PRIJEVARA I PRANJA NOVCA

Porezna kaznena djela pripadaju skupini kaznenih djela koje su države obvezne tretirati kao predikatna djela pranja novca. Poseban značaj porezne utaje istaknut je i u revidiranim Preporukama FATF-a iz 2012. (FATF, 2012-2021) koje državama i njihovim financijskim institucijama pružaju snažnije alate suprotstavljanja financijskom kriminalu, dok u isto vrijeme ukazuju na nova prioritetna područja poput proliferacije oružja za masovno uništenje, pojačane procjene rizika, povećanja transparentnosti, borbe protiv korupcije i međunarodne suradnje (FATF, 2012, str. 16-18).

Kružne prijevare u sustavu PDV-a uključuju prijenos značajnih iznosa novčanih sredstava unutar financijskog sektora, prerušenih u zakonite poslovne transakcije. Prema Rezoluciji Europskog parlamenta (2016/2033(INI), temeljeno na procjenama Europola, između 40 i 60 milijardi eura godišnjih gubitaka prihoda od PDV-a država članica uzrokuju organizirane kriminalne skupine, a 2 % tih skupina stoji iza 80 % prijevara MTIC-a. S obzirom na sofisticirane mogućnosti prijenosa novca na globalnoj razini, tokovi novca često su usmjereni i na države izvan EU-a s brzim, učinkovitim i razvijenim bankarskim sektorom. U skladu s navedenim, apostrofira se značaj procjene rizika kroz čimbenike i varijable rizika te značaj provođenja mjera dubinske analize stranke i stvarnog vlasnika, s naglaskom na obvezu uspostave registra stvarnih vlasnika. U sumnjivim se okolnostima primjenjuju mjere provođenja pojačane dubinske analize stranke te stalnog praćenja poslovnog odnosa kako bi transakcije bile u skladu sa saznanjima o stranci, poslovnom profilu, profilu rizika, uključujući i podatke o izvoru sredstava.

Zbog prirode kaznenog djela porezne utaje i značajnog opsega raspoloživih sredstava, kružna prijevara predstavlja ozbiljan rizik omogućavanja ulaganja nezakonitih sredstava porijeklom iz drugih kaznenih djela, kao i posljedično ulaganje takvih sredstava u počinjenje drugih kaznenih djela. U cilju prevencije nezakonitog postupanja, neophodna je suradnja nadležnih tijela i bankarskog sektora te međunarodna razmjena informacija kao podloga brzog i učinkovitog otkrivanja i prijavljivanja sumnjivih transakcija (FATF, 2007, str. 13).

Razmjerno mali broj kaznenih postupaka za pranje novca koji se vode pred nadležnim tijelima Republike Hrvatske, s poreznom utajom kao predikatnim kaznenim djelom, ukazuje na značajne probleme u otkrivanju i procesuiranju takvog nezakonitog postupanja. Porezna utaja je najčešće posljedica transfera novca pravne osobe sa sjedištem u Republici Hrvatskoj na račun trgovačkog društva u poreznoj oazi ili u Republici Hrvatskoj, ali pod kontrolom počinitelja tog kaznenog djela. Razmjerno su česte i kružne prijevare povezane sa zločinačkim udruženjem te počinjene po osnovi neosnovanog povrata PDV-a (Ministarstvo financija, 2020, str. 9).

6. ZAKLJUČAK

Kružna prijevara je omogućena primjenom načela odredišta temeljem kojeg se dobra oporezuju u državi u kojoj dolazi do krajnje potrošnje, sukladno poreznim stopama predviđenim nacionalnim zakonodavnim uređenjem. Provodi se veći broj transakcija između više trgovačkih društava u što kraćem vremenskom periodu, s ciljem prikrivanja stvarne namjere jednog nestajućeg trgovca. Radi postizanja veće legitimnosti poslovnog odnosa, neka od trgovačkih društava uvučena su u prijevarna postupanja bez svjesne privole. U tom slučaju, načelo dobre vjere nije zahtjev poreznim obveznicima u pogledu rezultata, već pretpostavlja ulaganje truda ovisno o okolnostima slučaja te dijeli rizik podjednako između svih poreznih obveznika koji sudjeluju u transakciji i poreznih tijela. Iako isporuke dobara i usluga mogu biti stvarne ili fiktivne, kod kružnih prijevara uvijek završavaju u državi u kojoj je prijevarno postupanje započelo.

Uz osnovne odlike dinamične prirode kružnih prijevara te modaliteta njihova provođenja, kao i predloženih administrativnih i tehnoloških mogućnosti njihove prevencije, Republika Hrvatska nastoji prevenirati prijevarna postupanja djelovanjem Samostalnog sektora za otkrivanje poreznih prijevara, ističući neophodnost međunarodne suradnje i procjene rizika. Ističući posebni značaj porezne utaje istaknut revidiranim Preporukama FATF-a, može se zaključiti da su vrtuljak prijevare pogodne za inicijalno prikupljanje sredstava koja će naknadno proći proces pranja novca (predikatno djelo) ili za pranje prihoda koji imaju podrijetlo u počinjenju drugih kaznenih djela. S obzirom na usku povezanost kružnih prijevara s pranjem novca, osnovano je očekivati odgovor na međunarodnoj razini, kao i reakciju na isto tako globalni efekt koji takva povezanost postiže.

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Utjecaj javobilježničke profesije na procjenu rizika od pranja novca*

The Impact of the Notary Profession on Money Laundering Risk Assessment

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Sažetak: *Utjecaj globalizacije na razvoj procesa pranja novca i financiranja terorizma, postepeno je uključio i javnobilježničku profesiju. Upravo ova profesija dobiva sve veći značaj u prevenciji pranja novca i financiranja terorizma provedbom osnovnih koraka sastavljanja i izrade javnobilježničkih isprava. Spomenuta aktivnost je posebno izražena kod identifikacije potpisnika te upisivanja točnih i istinitih podataka prilikom izmjena i dopuna javnobilježničkih isprava. Priroda javnobilježničkog rada omogućava procjenu rizika kojom utvrđuje razinu rizika od pranja novca i financiranja terorizma s pojedinačnom strankom, poslovnim odnosom, financijskim instrumentom te transakcijom. Stoga je ova profesija dužna procjenjivati rizik na razini obveznika što obuhvaća i prijave sumnjivih transakcija. Kao krucijalan alat za sprječavanja prijevara ističe se opravdana uskrata službene radnje javnog bilježnika iz razloga ništetnosti pravnog posla, postizanja očigledno nedopuštenog ili nepoštenog cilja, kao i zbog izvršenja kaznenih djela, nemogućnosti poštovanja bitnih formalnosti pri sastavljanju javnobilježničke isprave, odnosno službenom ovjeravanju privatnih isprava i nedostatka punomoći te iz drugog opravdanog razloga ako stranka nije ovlaštena na poduzimanje i sklapanje pravnog posla.*

Abstract: *The impact of globalization on the development of money laundering and terrorist financing has gradually included the notary profession, which is gaining more and more important in the prevention of money laundering and terrorist financing by implementing the basic steps of compiling and drafting notarial documents. It is especially pronounced in the identification of signatories and entry of accurate and true data when amending notarial documents. The nature of notarial work allows risk assessment to determine the level of risk of money laundering and terrorist financing with an individual party, business relation, financial instrument, and transaction. Therefore, this profession is obliged to assess the risk at the level of taxpayers, which includes reports of suspicious transactions. The essential tool for preventing fraud is the justified denial of official action of a notary public due to the nullity of a legal transaction, achieving an evidently inadmissible or unfair goal, as well as due to committing criminal offenses, inability to comply with essential formalities when drawing up a notarial document, i.e. official certification of private documents, and lack of power of attorney and for other justified reasons if the party is not authorized to undertake and conclude a legal transaction.*

1. UVOD

Pranje novca je put raskidanja veza između nezakonitih radnji i sredstava koja iz njih proizlaze. To je proces kaznene legitimacije u kojemu počinitelji traže način kako ga olakšati i ubrzati primjenom vještina i resursa pravnih stručnjaka, s njihovim pristankom i bez njega (Hamman & Koen, 2012). Budući da se aktivnosti pranja novca i financiranja terorizma (u nastavku: PN/FT) često provode u međunarodnim financijskim tokovima, revizijom Preporuka FATF-a 2003. proširen je njihov doseg tijelima koja pružaju pristup financijskom sustavu, tzv. vratarima. Samostalne profesije i struke mogu identificirati i spriječiti protupravne tokove novca kroz financijski sustav praćenjem ponašanja svojih te novih stranaka (FATF, 2018).

Djelovanje javnih bilježnika na području sigurnih pravnih podataka u pravu nekretnina i/ili pravu društva osobito služi sudionicima u gospodarskom prometu. Stoga pripadnici ove pravne profesije svojom obvezujućom nazočnošću i utvrđivanjem identiteta sudionika u javnobilježničkom

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postupku sastavljanja javnih isprava daju značajan doprinos unutarnjoj sigurnosti, zbog čega se poslovi koji podliježu javnom ovjeravanju čine manje atraktivnima za kaznene aktivnosti poput pranja novca (Zimmermann & Schmitz-Vornmoor, 2009).

2. POLITIKE I PROCEDURE JAVNOBILJEŽNIČKE PROFESIJE U PREVENCIJI PRANJA NOVCA

Osnovne značajke javnobilježničke profesije predstavljaju javne bilježnike kao samostalne i neovisne nositelje službe. Stoga oni nisu zastupnici stranke, već su njezini nepristrani povjerenici (NN 55/11). Nastavno na spomenuta obilježja veže se javnobilježnička tajna. Javni bilježnik je dužan čuvati kao tajnu sve podatke i informacije koje u obavljanju službe sazna te ih ne smije zloupotrebljavati protiv stranke ili na neki drugi način. Dužnost čuvanja javnobilježničke tajne postoji i nakon prestanka službe, osim ako iz zakona, volje stranaka ili sadržaja pravnog posla ne proizlazi nešto drugo. Sukladno članku 37. Zakona o javnom bilježništvu (dalje u tekstu: ZJB), (NN 78/93, 29/94, 162/98, 16/07, 75/09, 120/16), javni bilježnik ne smije podnositi prijave protiv stranaka u povodu zatraženog pravnog mišljenja ili postavljenog zahtjeva za poduzimanje službenih radnji, a ni bilo kojem tijelu vlasti dostavljati primjerke svojih isprava bez njihova pisana zahtjeva za dostavu pojedinačne i jasno određene javnobilježničke isprave. Međutim, ako stranka zatraži od javnog bilježnika savjet vezan za pranje novca ili temeljem pravnog posla, javni bilježnik sumnja na pranje novca, isto se ne smatra javnobilježničkom tajnom. Javni bilježnik predmetnu sumnju mora prijaviti nadležnim tijelima, odnosno Uredu za sprječavanje pranja novca.

Javnobilježnička struka, kao i ostale samostalne profesije i struke, uključena je u sustav prevencije PN/FT izmjenama i dopunama Zakona o sprječavanju pranja novca (NN 117/03). U pravilu, recentni Zakon o sprječavanju pranja novca i financiranja terorizma (NN 108/17, 39/19) prepoznaje specifičnosti javnobilježničke profesije samo u odnosu na primarnu obvezu dostave podataka o zatraženom savjetu za pranje novca. Međutim, spomenuti iskorak javnih bilježnika u obuhvatu prijave sumnjivih transakcija na pranje novca rezultira pozitivnom trendu kontinuiranog evidentiranja prijava.

Politika upravljanja rizikom u pravilu uključuje postupke prijema i obrade stranke, postupke analize rizika, obuke zaposlenika, mehanizma internih kontrola, kao i postupke otkrivanja i izvještavanja o sumnjivim transakcijama, odgovornosti osoblja za provedbu mjera za otkrivanje i sprječavanje PN/FT te druge postupke (Urad RS, 2018). Priroda javnobilježničkog rada omogućava i druge zapise o strankama i vrste pravnih poslova. Svaka usluga, odnosno pravni posao je evidentiran u odgovarajuće evidencije (knjige) i trajno pohranjen u uredu javnog bilježnika.

Neki od ključnih indikatora za prepoznavanje sumnjivih transakcija i stranaka obuhvaća korištenje lažnog imena, odnosno lažne ili krivotvorene identifikacijske isprave ili odbijanje identificiranja originalnih osobnih dokumenata. Značajni indikator se odnosi na plaćanje naknade za uslugu koja je veća od uobičajene isplate za obavljanje određenog pravnog posla, kao i angažiranje nekoliko javnih bilježnika s različitog geografskog područja za obavljanje usluga koje je mogao provesti isti javni bilježnik. Indikatori također obuhvaćaju zastupanje ovlaštene osobe kada je to neuobičajeno za određenu vrstu transakcije, a nemaju dovoljno znanja o stranci koju predstavljaju, kao i odbijanje dostave izrađenog javnobilježničkog akta ili ovjerenog ugovora nadležnim tijelima (porezna uprava, sud i sl.).

Ostali indikatori obuhvaćaju sveobuhvatne transakcije, složene ili neuobičajene, koje se najčešće provode s povezanim osobama ili osobama koje nisu uobičajene stranke, nadalje ekonomski ili

pravno nelogične transakcije stranaka s trgovačkim društvima iz zemalja poznatih kao porezna utočišta ili s trgovačkim društvima nepoznatog stvarnog vlasnika, kao i zahtijevanje provođenja transakcije u ime i račun javnog bilježnika, što je u suprotnosti s obavljanjem profesije javnog bilježništva. Također je bitno istaknuti indikatore koji su vezani za transakcije nekretnina, odnosno kupnju nekoliko nekretnina bez ekonomski ili pravno utemeljenih razloga u kratkom roku, kao i prodaju nekretnina u izrazito kratkom roku nakon kupnje, unatoč financijskim gubicima (Urad RS, 2018).

3. OSNOVNI KORACI SPRJEĆAVANJA PRIJEVARA JAVNOBILJEŽNIČKE PROFESIJE

Prilikom obavljanja pravnog posla, koraci prevencije pranja novca obuhvaćaju osobnu prisutnost stranke, identifikaciju potpisnika, detaljan pregled dokumenata, odnosno javnobilježničkog akta, unos transakcije u registre (upisnik i knjigu javnog bilježnika), pažljivo završiti javnobilježnički akt te ispuniti notarsku potvrdu. U pravilu, osobna prisutnost stranke je baza ostalim koracima bez iznimke za ovaj korak. Učinkovito sprječavanje prijevare zahtijeva fizičku prisutnost potpisnika jer se tako on može ispravno identificirati i upoznati s javnobilježničkim činom.

Identifikacija, odnosno utvrđivanje istovjetnosti potpisnika javnobilježničke isprave propisana je člankom 60. ZJB-a (NN78/93, 29/94, 162/98, 16/07, 75/09, 120/16). Stoga će javni bilježnik, ako ne poznaje sudionike osobno i po imenu, njihovu istovjetnost utvrditi osobnom iskaznicom ili putovnicom (dokument sa slikom). Ako spomenuto nije moguće, njihovu će istovjetnost posvjedočiti drugi javni bilježnik ili dva svjedoka istovjetnosti. U ispravi javni bilježnik obavezno navodi poznaje li sudionike, odnosno na koji način je utvrdio njihovu istovjetnost, uz točno navođenje imena, zanimanja i prebivališta svjedoka istovjetnosti, datuma i broja isprave upotrijebljene za utvrđivanje istovjetnosti i državu izdavanja isprave.

Detaljan pregled javnobilježničkog akta bitan je radi sprječavanja pogrešaka te neostavljanja mjesta naknadnim pokušajima malverzacija, a posebno ako predmetni akt sastavlja javni bilježnik. Potrebno je još jednom dobro proučiti napisani tekst te popuniti praznine ako su ostale. Prazninama nije mjesto u aktu iz razloga njihove zloupotrebe na način kasnijeg popunjavanja neistinitim podacima. Akt ne bi trebao biti datiran nakon datuma javnog bilježnika.

Svaka javnobilježnička isprava mora biti evidentirana u knjigama javnog bilježnika. Članak 116. ZJB-a (NN78/93, 29/94, 162/98, 16/07, 75/09, 120/16) propisuje upise bez odgađanja, redom pristizanja predmeta, čitko i bez ostavljanja praznih rubrika. Brisanja unesenih podataka nisu dozvoljena, a ispravak upisa pogrešnog podatka vrši se precrtavanjem vodoravnom crtom, tako da precrtani podatak ostane čitak. Prije stavljanja u uporabu, upisnici i knjige, osim imenika moraju biti povezani, njihovi listovi rednim brojevima označeni, jamstvenikom prošiveni te pečatom Komore ovjereni.

Izmjene i dopune javnobilježničke isprave propisane su člankom 46. ZJB-a (NN78/93, 29/94, 162/98, 16/07, 75/09, 120/16), prema kojem u ispravi ne smije biti riječi ili znakova iznad teksta isprave, među recima ili uz rub teksta. Svaka riječ ili potpis koji se nalazi na spomenutim mjestima smatra se nepostojećim. Ako se moraju izvršiti izmjene ili dopune isprave, to će se učiniti na kraju isprave s napomenom, odnosno mora biti točno određeno na koji se dio teksta odnose. Izmjene i dopune obavljaju se precrtavanjem riječi koju je potrebno izmijeniti tako da ostane čitka. Broj precrtanih riječi napisat će se na kraju isprave s oznakom strane i reda isprave te broja precrtanih riječi. Izmjene i dopune potpisat će stranke i javni bilježnik, ako su one unesene u ispravu nakon što je potpisana. U ispravi se ništa ne smije izbrisati, dok isprava koju je sastavio javni bilježnik bez njegova pečata i potpisa nema snagu javne isprave.

Još jedna specifičnost zaštite javnobilježničke isprave propisana je člankom 34. ZJB-a (NN78/93, 29/94, 162/98, 16/07, 75/09, 120/16). Njime je propisana dužnost javnog bilježnika upozoriti stranke zbog sumnje u nedostatak punomoći ili drugih razloga ako nisu ovlaštene za poduzimanje ili sklapanje pravnog posla. Međutim, ako one usprkos tome zahtijevaju sastavljanje javnobilježničke isprave, javni će bilježnik sastaviti ispravu, ali će u njoj navesti da je stranke upozorio na nedostatak.

Završavanjem javnobilježničkog akta provjerava se valjanost prethodnih koraka te se još jednom, ako je potrebno, s potpisnicima raspravlja o samom aktu. Potpisnici se potpisuju u prisustvu javnog bilježnika, uz naknadnu provjeru točnosti upisanih podataka.

4. USKRATA SLUŽBENE RADNJE KAO ALAT ZA SPRJEČAVANJE PRIJEVARA

Javni bilježnik ne smije bez valjanog razloga uskratiti poduzimanje službenih radnji. Ako utvrdi postojanje valjanog razloga za uskratu, odnosno kada je uvjeren u nespojivost posla sa svojom službenom dužnošću, javni bilježnik će uskratiti obavljanje službe. Međutim, samo postojanje sumnje u prethodno spomenuto nije dovoljan razlog za uskratu službene radnje, nego je potrebno predmetnu sumnju raspraviti sa strankama te ih upozoriti. Sukladno članku 34. ZJB-a (NN 78/93, 29/94, 162/98, 16/07, 75/09, 120/16) javni bilježnik je u obvezi poduzimati službene radnje bez povrede materijalno-pravnog propisa ili propisa koji uređuju njegovu službu.

Uskrata službenih radnji je opravdana ako je izvršena iz razloga ništetnosti pravnog posla, postizanja očigledno nedopuštenog ili nepoštenog cilja, kao i zbog kriminalne, odnosno zločinačke djelatnosti. Opravdana je i uskrata službene radnje zbog nemogućnosti poštovanja bitnih formalnosti pri sastavljanju javnobilježničke isprave, odnosno službenom ovjeravanju privatnih isprava i nedostatka punomoći te iz drugog opravdanog razloga ako stranka nije ovlaštena na poduzimanje i sklapanje pravnog posla. Stoga, javni bilježnik ne smije kod bjelodanih okolnosti koje upućuju na ništetnost sastaviti javnobilježničku ispravu o ništetnom pravnom poslu, odnosno poduzeti drugu službenu radnju jer je to nespojivo s javnim karakterom njegove službe i njegovim svojstvom osobe od javnog povjerenja (Prančić, 2008).

Kao razloge ništetnosti valja spomenuti i prividne ugovore propisane člankom 285. Zakona o obveznim odnosima (NN 35/05, 41/08, 125/11, 78/15, 29/18, 126/21), odnosno zaključivanje pravnog posla s drukčijim sadržajem i pravnim učincima od onoga koji simuliraju. Prividnim pravnim poslom smatra se zaključivanje javnobilježničke isprave o kupoprodaji koja sadrži manju vrijednost nekretnine od njezine stvarne tržišne vrijednosti, a cilj joj je plaćanje manjeg poreza. S druge strane, predmetna isprava može sadržavati i veću vrijednost nekretnine zbog prikrivanja nezakonito stečenog novca ili dobivanja većeg iznosa kredita (Prančič, 2008).

U slučajevima prijetnje i prijevare, zapravo samo iznimno u vrijeme poduzimanja službene radnje, javni bilježnik prepoznaje okolnosti koje su osnova za pobijanje pravnog posla. Ako on uoči prijetnju ili prijevaru, dužnost čuvanja javnobilježničke radnje ne sprječava ga razjasniti s osobom koje se to tiče. Uskrata službene radnje opravdana je samo onda ako je javni bilježnik uvjeren u nedopuštene i nepoštene ciljeve i ako je savjesno ispitao povod ili razlog uskrate predmetne radnje. Sama sumnja nije dovoljna. Isto tako, nije dužan bez posebnog povoda poduzimati istraživanje o prikrivenom cilju stranke koja zahtijeva poduzimanje službene radnje, nego podatke dobivene od stranke prihvaća kao točne i poduzetu radnju temelji na predmetnim podacima (Prančić, 2008).

Već je ranije spomenuto kako stranke usprkos tome što isprava ima određeni nedostatak ili nije potpuna zahtijevaju sastavljanje javnobilježničke isprave. Javni bilježnik će sastaviti ispravu, ali će u njoj navesti upozorenje stranke na nedostatak. Ako se stranke protive takvoj napomeni, odnosno naznačenom upozorenju o nedostacima i njihovim pravnim posljedicama, javni bilježnik je dužan uskratiti poduzimanje službene radnje.

5. OBVEZA OBAVJEŠĆIVANJA O SUMNJIVIM TRANSAKCIJAMA

Provođenje mjera prevencije PN/FT javnobilježničke profesije čine se zahtjevnima zbog uske povezanosti s dužnosti čuvanja javnobilježničke tajne. Međutim, nadnacionalnom procjenom rizika (European Commision, 2017) ističe se da poštovanje pravila za suzbijanje PN/FT ni na koji način ne utječe na načelo čuvanja povjerljivosti. Dok druga nadnacionalna procjena rizika (European Commision, 2019) ističe dodatne mjere kojima su tijekom 2018. javnim bilježnicima dodijeljena bespovratna sredstva Europske unije za potrebe sprječavanja PN/FT.

Prvom nacionalnom procjenom rizika od PN/FT (Ministarstvo financija, 2016) procijenjena je ranjivost javnobilježničke profesije na srednje nisku (0,30). Procjena sljedeće Nacionalne procjene rizika od PN/FT (Ministarstvo financija, 2020) nešto je veća od prve, što znači da je utvrđena ranjivosti spomenute profesije srednja s ocjenom inherentne ranjivosti 0,41. Također je utvrđeno da javni bilježnici obavljaju rizičnije poslove (vezane za osnivanje, poslovanje ili upravljanje trustovima, trgovačkim društvima, zakladama ili sličnim pravnim uređenjima, provođenje transakcija koje uključuju nekretnine u ime stranke ili za stranku, kao i druge financijske transakcije u ime stranke ili za stranku), međutim profil stranaka s kojima posluju utvrđen je kao srednje rizičan.

Statistika dostavljenih obavijesti o sumnjivim transakcijama javnobilježničke profesije za razdoblje 2010. – 2020. prikazana je u nastavku teksta. Predmetnom statistikom usporedno je prikazano koliki je udio dostavljenih obavijesti javnih bilježnika u ukupnom broju svih dostavljenih obavijesti o sumnjivim transakcijama za 13 promatranih zemalja.

Tablica 1. Udio prijava javnih bilježnika u ukupnom broju prijava sumnjivih transakcija za razdoblje 2010. - 2020.

Država	Udio prijava sumnjivih transakcija u %										
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Andora	9,1	4,8	4,0	0,0	2,8	,1,7	0,0	1,7	4,0	5,1	2,7
Austrija	0,3	0,1	0,2	0,5	0,3	0,2	0,2	0,7	0,5	1,0	0,5
Belgija	35,8	46,1	52,8	53,3	56,0	52,0	51,0	44,0	45,0	46,2	44,4
Bugarska	0,3	0,2	0,3	0,1	0,1	0,1	0,0	0,3	-	-	-
Estonija	0,4	0,2	0,3	0,4	0,3	0,5	0,5	0,4	0,9	1,2	0,1
Francuska	3,5	4,7	3,8	3,5	2,8	2,3	1,7	2,0	1,9	1,9	1,4
Hrvatska	3,8	1,4	3,8	0,8	1,4	1,1	0,5	0,4	0,4	0,4	0,1
Italija	0,2	0,4	2,8	2,8	3,0	3,9	3,5	4,5	4,4	4,4	2,9
Luksemburg	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Nizozemska	0,8	0,9	1,0	0,7	0,6	0,4	0,3	0,2	0,3	0,4	0,5
Njemačka	0,0	0,1	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Slovenija	0,4	0,0	0,4	0,2	0,8	0,0	0,2	0,4	0,3	0,2	-
Srbija	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,4	10,0	15,6	7,6

Izvor: analiza autorice na osnovi podataka godišnjih izvješća analiziranih financijsko-obavještajnih jedinica

Analizirajući broj prijavljenih sumnjivih transakcija od strane javnih bilježnika s ukupnim brojem prijavljenih sumnjivih transakcija, zapažena je njihova neujednačenost. Iako je kod javnih bilježnika prepoznata viša razina svijesti vezano za prijavu sumnjivih transakcija, još uvijek se radi o niskom broju prijava sumnje na PN/FT. Kao razlog tome može se navesti kasnija zakonska regulacija i nadzor predmetne struke vezano za prevenciju PN/FT za razliku od nekih drugih obveznika (bankarski sektor). Također je moguća prisutnost sumnjivih transakcija prijavljenih iz razloga opreza, s obilježjima neobičnosti ili nelogičnosti. Stoga se može zaključiti da je broj prijavljenih sumnjivih transakcija dvojben i nedovoljan pokazatelj učinkovitosti primjene procjene rizika.

6. ZAKLJUČAK

Nastojanja javnobilježničke profesije u sprječavanju PN/FT krucijalna su prilikom identifikacije potpisnika, odnosno utvrđivanja istovjetnosti potpisnika javnobilježničke isprave, kao i sastavljanja te izmjena i dopuna javnobilježničkih isprava. Opravdana uskrata službenih radnji javnog bilježnika još je jedan od bitnih alata u prevenciji PN/FT. Iako javni bilježnici obavljaju rizičnije poslove, profil stranaka s kojima posluju utvrđen je kao srednje rizičan. Međutim, unatoč malom broju prijavljenih obavijesti spomenute profesije vidljiva je namjera u svjesnom provođenju zakonskih propisa kroz kontinuiranu prijavu sumnjivih transakcija. Naglasak se stavlja na podizanje svijesti o rizicima PN/FT kroz ciljanu edukaciju i učinkovit nadzor.

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Pregled novih trendova u energetici

Overview of New Trends in Energetics

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Sažetak: *Svijet se danas suočava s velikim energetskim problemima, a jedan od najvećih problema predstavljaju klimatske promjene uzrokovane velikim zagađenjima, što ugrožava prirodni okoliš te čovjekovu sadašnju i buduću dobrobit. Energija iz ugljičnih fosilnih goriva pokriva(la) (je) preko 80% svjetskih potreba u 2020. godini. To je vrlo alarmantan podatak, s obzirom da fosilna goriva uzrokuju velike emisije stakleničkih plinova, što dovodi do velikih klimatskih promjena, rasta prosječne temperature na Zemlji i mnogih drugih negativnih posljedica. Kako bi se klimatske promjene okončale, koncentracija stakleničkih plinova u atmosferi mora se stabilizirati, a da bi se to postiglo, svjetske emisije stakleničkih plinova moraju se smanjiti prema nuli. Svijetu je stoga neophodna energetska transformacija. Nakon Pariškog sporazuma o klimi 2015. godine, počele su se događati značajnije promjene u svjetskom energetskom sektoru. Iz tog razloga u ovom su radu opisane promjene odnosno novi trendovi koji počinju mijenjati cjelokupni energetski sektor (npr. obnovljivi izvori, plin iz škriljevca, proces dekarbonizacije, decentralizacija i digitalizacija energetskog sektora, fleksibilnost energetskih sustava, te blockchain tehnologije).*

Abstract: *The world today faces major energy problems, and one of the biggest problems is climate change caused by heavy pollution, which threatens the natural environment and man's current and future well-being. Energy from carbon fossil fuels covers over 80% of the world's needs in 2020. This is very alarming information, given that fossil fuels cause large emissions of greenhouse gases, which lead to major climate changes, an increase in the average temperature on Earth, and many other negative consequences. To end climate change, the concentration of greenhouse gases in the atmosphere must stabilize, and to achieve this, global greenhouse gas emissions must be reduced to zero. The world, therefore, needs an energy transformation. After the Paris climate agreement in 2015, significant changes began to take place in the global energy sector. For this reason, this paper describes changes or new trends that are beginning to change the entire energy sector (e.g. renewable sources, shale gas, the decarbonization process, decentralization and digitalization of the energy sector, flexibility of energy systems, and blockchain technology.*

1. UVOD

U današnje vrijeme život je nezamisliv bez stalne, sigurne i dostatne opskrbe energijom. Sve što je suvremenom čovjeku potrebno u svakodnevnom životu ovisi o energiji te se često njezina upotreba ili potrošnja uzima kao indeks životnog standarda. Energija omogućuje pokretanje cjelokupnog prometa, rad strojeva i uređaja u industriji, služi za grijanje i osvjetljenje, omogućuje funkcioniranje infrastrukture gradova i sl. Ona opskrbljuje gospodarstvo i osnažuje mnoge usluge o kojima ovisimo te se može reći kako je energija osnova današnjeg visoko tehnički razvijenog svijeta. S obzirom na rast stanovništva i gospodarstva te poboljšanje životnog standarda i porast potrošnje, ukupna potražnja za energijom iz godine u godinu bilježi sve veći porast. U isto vrijeme, nazočna je i velika zabrinutost zbog iznimno štetnih emisija ugljikova dioksida (CO_2) i ostalih zagađenja koji dovode do klimatskih promjena te na taj način ugrožavaju okoliš.

Danas većina energije koju svijet troši dolazi iz fosilnih goriva, koji su ujedno i najveći zagađivači, stoga zemlje diljem svijeta donose rješenja za prijelaz na „čistije" izvore energije. Obnovljivi izvori energije, zajedno s određenim procesima i tehnologijama, imaju ključnu ulogu u rješavanju najvećih problema današnjice. Nazivaju se energetskim trendovima, s obzirom da se sve više razvijaju i integriraju u energetski sektor. Obnovljivi izvori energije, plin iz škriljevca,

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dekarbonizacija, decentralizacija i digitalizacija, fleksibilnost energetskog sustava te blockchain tehnologije su trenutno najaktualniji trendovi u svjetskom energetskom sektoru. Oni omogućuju bržu i jednostavniju energetsku transformaciju, smanjuju negativne utjecaje klimatskih promjena, pojačavaju energetsku sigurnost te daju širi pristup energiji. Osim toga, trendovi donose i brojne ekonomske koristi brojnim gospodarstvima, poput povećanja zaposlenosti, gospodarskog rasta, stabilnijih troškova energije, većih prihoda imovine, energetske neovisnosti i sl. Stoga su u nastavku rada opisane promjene odnosno novi trendovi koji počinju mijenjati cjelokupni energetski sektor.

2. NOVI TRENDOVI

2.1. Obnovljivi izvori

Obnovljivi izvori energije su primarni izvori energije koji se prirodno nadopunjuju ili obnavljaju. Neiscrpan su prirodni izvor, ali su ograničeni količinom energije koja je dostupna u jedinici vremena. U glavne obnovljive izvore ubrajaju se Sunčeva energija, energija vjetra, energija vode, geotermalna energija i energija biomase. S druge strane, u obnovljive izvore koji su u nastajanju spadaju energija plime i oseke, energija valova, termalna energija oceana, energija gravitacije, energija vodika i nuklearna fuzija. Obnovljivi izvori energije proizvode tzv. „čistu energiju“ ili „zelenu energiju“ koja ispušta manje stakleničkih plinova i samim time manje zagađuje okoliš što doprinosi klimatskim promjenama (Vlahinić Lenz, Žiković i Gržeta, 2019, str. 171).

Naime, sve tehnologije proizvodnje električne energije ispuštaju stakleničke plinove u određenom trenutku svog životnog ciklusa. Primjerice, proizvodnja električne energije iz fosilnih goriva uzrokuje puno veće emisije stakleničkih plinova nego kod proizvodnje iz obnovljivih izvora ili nuklearne energije. Na temelju životnog ciklusa, ugljen emitira čak 820 grama ekvivalenta CO_2 po kWh proizvedene električne energije, dok kopneni vjetar emitira samo 11 grama ekvivalenta CO_2 po kWh. Osim vjetra, prosječna vrijednost od 12 grama ekvivalenta CO_2 po kWh procijenjena je i za nuklearnu energiju, što je niže od svih ostalih vrsta izvora. Ostali obnovljivi izvori energije emitiraju otprilike između 12 grama i 48 grama ekvivalenta CO_2 po kWh, što je i dalje iznimno velika razlika u odnosu na fosilna goriva. Stoga, može se zaključiti kako je prijelaz na „čistije“ izvore energije nužan kako bi se smanjila zagađenja i na taj način suzbile klimatske promjene. Kao odgovor na nužne promjene, energija iz obnovljivih izvora je u posljednjih nekoliko godina postala najbrže rastući izvor energije. Naime, problemi uzrokovani fosilnim gorivima doveli su do toga da su vlade, kompanije, investitori i javnost prepoznali potrebu za dekarbonizacijom svjetske ekonomije. Većina rješenja do niskougljičnog gospodarstva zahtijeva primjenu obnovljivih izvora i udvostručavanje energetske učinkovitosti što je upravo razlog znatnog porasta obnovljivih izvora. Učinak njihovog izvanrednog rasta najviše se osjetio u elektroenergetskom sektoru. Od 2012. godine, obnovljivi izvori dodali su više novih kapaciteta za proizvodnju električne energije od konvencionalnih izvora energije. Najbrži rast u posljednjem desetljeću ostvarili su solarna energija i energija vjetra te se taj rast nastavlja i dalje, dok ostali obnovljivi izvori rastu postupnije. Tako je solarna energija dodala više novih proizvodnih kapaciteta u 2017. godini nego što su to ugljen, prirodni plin i nuklearne elektrane zajedno (IRENA, 2019).

S godinama je solarna energija značajno zaostajala za energijom vjetra u smislu godišnjeg instaliranog kapaciteta i kumulativnog kapaciteta, ali zadnjih nekoliko godina sve je brže zatvarala jaz u godišnjim instalacijama. Predviđeno je da će solarna energija nadmašiti energiju vjetra u novom instaliranom kapacitetu, što se i dogodilo prema najnovijim podacima iz 2021. godine. Razlog

zbog kojeg je solarna energija posljednjih godina u tako velikom porastu je masovan pad cijena, što ju je učinilo isplativim i pouzdanim izvorom energije. Do neviđenog pada cijena solarne energije došlo je prvenstveno zbog tehnološkog napretka i smanjenja troškova, čime obnovljivi izvori postaju sve konkurentniji s fosilnim gorivima, posebice u proizvodnji električne energije. Dakle, izgradnja novih kapaciteta i smanjenje troškova proizvodnje ne bi bilo moguće bez tehnoloških inovacija. Inovacije, poput većih vjetroagregata i učinkovitijih solarnih fotonaponskih modula (PV), su odigrale vrlo važnu ulogu u ubrzavanju uvođenja obnovljivih izvora u elektroenergetski sektor. Globalno ponderirani prosječni izjednačeni troškovi električne energije za solarne fotonaponske module (PV) i kopnene vjetroelektrane pali su za 77% odnosno 35% između 2010. i 2018. godine. Globalna proizvodnja električne energije iz obnovljivih izvora također je porasla za 7% u 2018. godini, predvođena Kinom, koja je činila gotovo 37% rasta vjetra na moru i 44% povećanja solarnog PV-a (Berahab, 2020).

Naime, Kina je od 2010. do 2015. godine imala iznimno visoke oscilacije iz godine u godinu, koje su se nakon 2015. stabilizirale te je proizvodnja nastavila postepeno rasti sve do 2019. godine. Osim Kine, u proizvodnji obnovljivih izvora ističe se i Indija koja od 2015. bilježi blagi porast koji nastavlja i dalje rasti nakon 2019. godine. Za razliku od ostalih zemalja koje godišnje imaju rast od 5 TWh do 100 TWh, Kina je ostvarila rast od 200 TWh do 400 TWh u razdoblju od 2015. do 2019. godine, što pokazuje njezinu dominaciju u proizvodnji obnovljivih izvora energije.

Prema najnovijim podacima Međunarodne agencije za obnovljivu energiju, u 2020. godini povećanje kapaciteta obnovljivih izvora energije nadmašilo je sve ranije procjene i sve prethodno ostvarene rekorde, bez obzira na ekonomsko usporavanje koja je bila posljedica Covid-19 pandemije. Tako je svijet u 2020. godini instalirao više od 260 GW kapaciteta obnovljive energije, što je rast od gotovo 50% u odnosu na 2019. godinu. Više od 80% svih novih električnih kapaciteta dodanih 2020. godine bilo je obnovljivo, a solarna energija i energija vjetra činili su 91% novih obnovljivih izvora energije. Krajem 2020. godine globalni obnovljivi proizvodni kapaciteti iznosili su 2799 GW, a najveći udio imala je hidroenergija, sa 1211 GW, iako ju solarna energija i energija vjetra brzo sustižu. Naime, solarna energija je imala proširenje kapaciteta sa 127 GW, dok je vjetar imao 111 GW novih instalacija (u odnosu na 58 GW u 2019. godine), što je apsolutna dominacija u odnosu na druge izvore (IRENA, 2021). Kina i SAD imale su izuzetan rast tržišta od 2020. godine. Kina, koja je inače najveće svjetsko tržište za obnovljive izvore, je dodala 136 GW novih instalacija, od čega 72 GW dolazi iz energije vjetra, a 49 GW iz solarne energije. SAD je 2020. godine instalirao 29 GW obnovljivih izvora, uključujući 15 GW solarne energije i 14 GW energije vjetra. Za razliku od prethodne 2019. godine, to je rast od gotovo 80%. Afrika se također nastavila širiti s povećanjem od 2,6 GW, što je malo više od 2019., dok je Oceanija najbrže rastuća regija sa 18,4 GW, iako je njezin udio u globalnim kapacitetima mali i gotovo se većinu širenja dogodilo u Australiji (IRENA, 2021).

Rastući udio obnovljivih izvora energije u ukupnom iznosu djelomično se može pripisati neto dekomisiji proizvodnje energije iz fosilnih goriva u Europi, Sjevernoj Americi i po prvi put u Euroaziji (Armenija, Azerbajdžan, Gruzija, Ruska Federacija i Turska). Ukupni dodaci fosilnih goriva pali su sa 64 GW u 2019. na 60 GW u 2020. godini, čime se nastavlja kontinuirani trend smanjenja ekspanzije fosilnih goriva (IRENA, 2021). Uz inovacije u proizvodnji, inovacije u digitalizaciji i skladištenju energije također otvaraju nove granice. Nove digitalne tehnologije, poput velikih podataka (Big Data), pametnih mreža i umjetne inteligencije, upotrebljavaju se u energetskoj industriji kako bi pomogli povećati njezinu učinkovitost i ubrzati uporabu obnovljivih izvora u novim pametnim sustavima za proizvodnju i distribuciju. Isto tako, razvijaju se nove tehnologije za skladištenje

energije, vitalne za promjenjive obnovljive izvore, kao što su Sunce i vjetar. Vjeruje se da će baterije, uključujući one u električnim vozilima, postati važna tehnologija skladištenja. Za dugoročno skladištenje postoje i druge mogućnosti, poput spremišta energije komprimiranog zraka ili vodik (IRENA, 2019). Stope patentiranja ukazuju na to da se u posljednjem desetljeću više tehnoloških inovacija dogodilo na području tehnologija čiste energije, nego na tradicionalnim energetskim područjima, poput fosilnih goriva i nuklearne energije. Međutim, najveći napredak u uvođenju obnovljivih izvora energije je koncentriran u sektoru električne energije. Dugoročno gledano, sljedeća generacija biogoriva i obnovljivih hidrogena generiranih elektrolizom mogu omogućiti obnovljivim izvorima energije da se prošire u sve veći raspon teško elektrificiranih sektora, poput zrakoplovstva, brodarstva i teške industrije (IRENA, 2019). Prema podacima BloombergNEF-a (2021), u period od 2004. do 2020. godine globalno ulaganje u energetsku tranziciju iznosilo je rekordnih 501 milijarde USD, pritom nadmašivši prethodnu godinu za 9% unatoč ekonomskim poremećajima uzrokovanim Covid-19 pandemijom. Najveće ulaganje postignuto je u nove kapacitete obnovljive energije u iznosu od 303,5 milijardi USD, što je porast od 2% u odnosu na prethodnu 2019. godinu. To je bilo drugo najveće godišnje ulaganje, nakon 2017. godine od 313,3 milijarde USD. Naime, pad kapitalnih troškova omogućio je instaliranje rekordnih količina solarne energije i vjetra što je dovelo do većih ulaganja u obnovljive izvore. Ulaganje u solarne kapacitete u 2020. godini iznosilo je 148,6 milijardi USD, a u vjetar 142,7 milijardi USD. Što se tiče regija, ulaganje u Europi je iznosilo 81,8 milijardi USD, što je za 52% više u odnosu na prethodnu godinu i to je najviše ulaganje od 2012. godine. Europa je zamalo sustigla Kinu kojoj su ulaganja iznosila 83,6 milijardi USD, što je pad od 12%. Ulaganje u obnovljive izvore povećalo se i u Japanu za 10% (19,3 milijardi USD), 221% u Nizozemskoj (14,3 milijarde USD), u Brazilu za 23% (8,7 milijardi USD) itd. Ostala područja ulaganja su također pokazala porast u 2020. godini. Ulaganje u energetski učinkovite dizalice topline iznosilo je 50,8 milijardi USD, što je povećanje od 12%, dok je ulaganje tehnologije za skladištenje energije, poput baterija, iznosilo 3,6 milijardi USD, što je na razini s 2019. unatoč padu jediničnih cijena. Globalna ulaganja u hvatanje i skladištenje ugljika (CCS) utrostručena su na 3 milijarde USD, a za vodik iznosilo je 1,5 milijardi dolara, što je pad od 20% (BloombergNEF, 2021).

U budućnosti se očekuje da će obnovljivi izvori energije, kao trend, ojačati u ovom desetljeću bez obzira na Covid-19 pandemiju koja je usporila ekonomski rast. Očekuje se da će se globalna potrošnja energije skoro udvostručiti do 2050. godine, kao rezultat povećane elektrifikacije. Udio električne energije u potrošnji energije porast će, sa 19% (u 2021. godini), na 30% do 2050. godine. Procjenjuje se kako će obnovljivi izvori energije u sljedećem desetljeću dominirati na globalnim tržištima jer postaju sve jeftiniji od fosilnih goriva. Isto tako, vjeruje se da će do 2036. godine, polovica globalne opskrbe električnom energijom dolaziti iz obnovljivih izvora. Iako će hidroelektrane ostati glavni izvor, većina rasta će doći od solarnih fotonaponskih elektrana i vjetroelektrana, te u manjoj mjeri, od geotermalnih elektrana i koncentriranih solarnih ploča. Procjenjuje se da će do 2035. godine biti instalirano 5 TW novih solarnih elektrana i vjetroelektrana, što bi bio peterostruki rast u odnosu na trenutnu razinu. Također, očekuje se da će se uporaba obnovljivih izvora energije udvostručiti u prometnom sektoru, predvođen biogorivima i obnovljivom električnom energijom, te da će se povećati i u sektoru grijanja, zahvaljujući većoj uporabi suvremene biomase, obnovljive električne energije i solarne topline (Grundy, 2021).

2.2. Plin iz škriljevca

Plin iz škriljevca (shale gas) je prirodni plin dobiven iz pločastih formacija škriljevca, često na dubinama do 1500 metara. Škriljevci su sitnozrnate sedimentne stijene sastavljene od blata koje mogu biti bogate izvorima nafte i prirodnog plina. Plin iz škriljevca ima isti sastav kao i

prirodni plin. Svaki plin iz škriljevca je prirodni plin, a razlika između vrsta plinova je lokacija ležišta. Prirodni plin se može naći u velikim količinama, dok se plin iz škriljevca zarobio unutar mikropukotina stijena. S obzirom da je škriljevac masivan mineral koji se vrlo teško vadi, proces vađenja je iznimno skup. Dobiveni plin se kasnije može ukapljivati i učinkovito skladištiti (MET, 2021). Plin iz škriljevca koristio se u vrlo malim količinama jer ga je do prije nekoliko desetljeća bilo vrlo neekonomično proizvoditi, bez obzira na znatne globalne zalihe. Naime, 2008. godine SAD je razvio novu metodu eksploatacije poznatom pod nazivom hidrauličko frakturiranje. Prema navedenoj metodi, plin iz škriljevca se vadio na način da se duboko ispod površine utiskuju kemikalije kako bi plin izašao na površinu. S obzirom da je razvio tu metodu i zaslužan je za veliki rast proizvodnje plina iz škriljevca, SAD je ubrzo postao značajan izvoznik plina (Vlahinić Lenz, Živković i Gržeta, 2019, str. 27). Glavni nedostatak plina iz škriljevca je taj što frakturiranje ima veliki utjecaj na okoliš. S obzirom da se za njegovo dobivanje koriste velike količine vode, mnoga prirodna staništa su ugrožena radi toga. Uz to, prilikom dobivanja nastaje velika količina otpadnih voda koje također mogu biti opasne za okoliš stoga je vrlo važno vaditi ga na pravilan način (MET, 2021).

Plin iz škriljevca je, uz prirodan plin, ekološki prihvatljivo fosilno gorivo koji pomaže u dekarbonizaciji energetskog sustava. Prirodni plin i plin iz škriljevca čistije sagorijevaju od ugljena ili nafte. Njihovim izgaranjem emitiraju se znatno niže razine ugljikova dioksida, dušikova oksida i sumpor dioksida za razliku od izgaranja ostalih fosilnih goriva. Kada se plin upotrebljava u učinkovitim elektranama s kombiniranim ciklusom, njegovim izgaranjem može se emitirati dvostruko manje CO2 od izgaranja ugljena, po jedinici oslobođene energije. Iz tog razloga, često ih se naziva mostom između sadašnjosti i budućnosti, s obzirom da je prijelaz na obnovljive izvore dugotrajan proces. Isto tako, postoji mogućnost da obnovljivi izvori u budućnosti neće moći sami zadovoljiti svjetske energetske potrebe, koje u posljednjih nekoliko desetljeća značajno rastu. Iz tog razloga, plin iz škriljevca, kao jedan od nekonvencionalnih izvora energije, mogao bi pomoći u ispunjenju energetskih potreba budućih generacija i to na ekološki prihvatljiv način (Bellani, 2021).

Nalazišta plina iz škriljevca razasuta su po cijelom svijetu u rezervoarima niske propusnosti i niske poroznosti. SAD je najveći svjetski proizvođač plina iz škriljevca. Vađenje plina iz škriljevca se drastično povećalo od 2000. godine, sa oko 300 milijardi kubičnih stopa na više od 23 bilijuna kubičnih stopa u 2020. godini. Prema projekcijama, predviđa se da će se proizvodnja plina iz škriljevca u SAD-u povećati do 34 bilijuna kubičnih stopa do 2050. godine. Iznimno velik porast proizvodnje plina iz škriljevca značajno je pridonijelo smanjenju uvoza prirodnog plina u SAD-u, što je jedan od ključnih razloga za takav ogroman napredak u energetskom sektoru. Naime, razlog toga je rast potražnje za energijom zbog čega je iscrpljivanje rezervi konvencionalnog plina rezultiralo pomakom prema nekonvencionalnim rezervama, poput prirodnog plina, plina iz škriljevca, uskog plina i sl. Osim SAD-a, komercijalnu proizvodnju plina iz škriljevca imaju i Kanada, Kina i Argentina. Očekuje se da će tehnološka poboljšanja tijekom sljedećeg desetljeća potaknuti razvoj proizvodnje škriljevca i u drugim zemljama, prvenstveno u Alžiru i Meksiku. Prema prognozama, SAD će i dalje ostati najveći proizvođač plina, s proizvodnjom od 80 milijuna kubičnih stopa dnevno u 2040. godini, što je upola više u odnosu na 2015. godinu. Predviđa se da će ovih šest zemalja činiti 70% globalne proizvodnje plina iz škriljevca do 2040. godine (EIA, 2016). Međutim, postoje mnoga istraživanja koja pokazuju da dugoročni procvat plina iz škriljevca ima tendenciju povećanja CO_2, što može izazvati povratne veze globalnog zatopljenja. Iz tog razloga, određene zemlje su proizvodnju plina iz škriljevca potpuno zabranile, uključujući Francusku, Bugarsku i Irsku, dok neke zemlje su ga djelomično zabranile, poput Njemačke i Nizozemske (European

Commission, 2014). Također, Covid-19 pandemija donijela je najveću promjenu u industriji od početka revolucije škriljca 2008. godine. Pandemija je spriječila rast tržišta te daljnja ulaganja se neće provoditi dok cijena ne bude isplativa. Očekivalo se da će čimbenici, poput povećanja potrošnje nafte i rasta industrije ovisnoj o nafti, pokrenuti tržište. Međutim, nestabilnosti na tržištu nafte s cijenama koje idu ispod troškova proizvodnje plina iz škriljevca je ograničenje, stoga proizvodnja se ne povećava dok se tržišta ne stabiliziraju.

Očigledno je da u narednoj budućnosti plin iz škriljevca ima ogroman potencijal preuzimanja mnogih svjetskih energetskih potreba. Prirodni plin, kao ekološki najprihvatljivije fosilno gorivo, oslobađa mnogo manju količinu stakleničkih plinova u usporedbi s drugim izvorima energije. No, još uvijek postoje neki ekološki problemi koje treba razmotriti u narednim godinama, prije nego što se svijet potpuno osloni na plin iz škriljevca kao nekonvencionalno gorivo.

2.3. Dekarbonizacija

Dekarbonizacija je proces smanjenja „intenziteta ugljika“ odnosno smanjenje količine emisija stakleničkih plinova koji su nastali izgaranjem fosilnih goriva. Preciznije, to se odnosi na smanjenje ugljikova dioksida (CO_2), koji nastaje potpunim izgaranjem ugljika, sadržanog u gorivima, a ispušta se u atmosferu i na taj način zagađuje okoliš te uzrokuje klimatske promjene (Kolundžić, 2015, str. 123). Može se reći da je dekarbonizacija proces pretvaranja svjetske ekonomije iz jedne koja pretežno radi na energiji dobivenoj iz fosilnih goriva, do one koja radi gotovo isključivo na čistoj energiji bez ugljika. Cilj dekarbonizacije je konačna eliminacija emisija ugljikovog dioksida (Welton, 2018).

Sve veća zabrinutost zbog nepovratnih klimatskih promjena dovela je do usvajanja Pariškog sporazuma na Pariškoj klimatskoj konferenciji (COP21) 2015. godine. Pariški sporazum je prvi opći pravno obvezujući globalni klimatski sporazum koji postavlja globalni okvir za izbjegavanje opasnih klimatskih promjena. Naime, sporazumom se želi reducirati globalno zagrijavanje na ispod 2°C i nastoji ga se ograničiti na 1,5°C jer bi se tako značajno smanjili rizici. Isto tako, cilj mu je ojačati sposobnost zemalja da se nose s utjecajima klimatskih promjena i želi ih podržati u tome. Uz borbu protiv klimatskih promjena, kao najveći prioritet u sporazumu je stavljena i dekarbonizacija energetskog sektora. Ona pomaže u rastu i razvoju obnovljivih izvora energije, poboljšanju energetske učinkovitosti, povećanju fleksibilnosti elektroenergetskih sustava, razvoju novih prijenosnika energije, smanjenju emisija i stvaranju novih tržišta za ugljik i druge nusproizvode kao dio sve cirkularnijeg gospodarstva (IRENA, 2018, str. 38). Pariški sporazum je prihvatilo i podržalo 197 zemalja svijeta, koje su se složile da će postepeno smanjivati upotrebu fosilnih goriva i emisija CO_2, kako bi se do 2050. godine postigla neto ugljična neutralnost, a globalno zagrijavanje ograničilo ispod 2°C do 2100. godine. Zemlje su u skladu sa sporazumom podnijele detaljne nacionalne klimatske akcijske planove, kao doprinos ciljevima sporazuma. U mnogim europskim zemljama uvedeni su još stroži standardi za smanjenje emisija, što je potaknulo značajne tehnološke inovacije, primjerice poput uvođenja električnih automobila u transportnom sektoru i instaliranja znatno većeg broja solarnih elektrana i vjetroelektrana. Dapače, pritisak potrošača, investitora i regulatora natjerao je tvrtke, posebice u Europi, da odvoje više vremena i resursa smanjenju utjecaja na okoliš. To je znatno pridonijelo smanjenju troškova obnovljivih tehnologija i njihovoj sve jačoj konkurentnosti, što ih čini održivim alternativama fosilnim gorivima u određenim sektorima. Međutim, dekarbonizacija se ne odvija u svim zemljama istom brzinom i na isti način, što predstavlja problem oko postizanja ciljeva u točno određenom vremenskom razdoblju, konkretnije 2050. godini. Primjerice, ako su

neka razvijena gospodarstva već na dobrom putu dekarbonizacije, između ostalog zahvaljujući promjeni strukture potražnje za energijom zbog napretka u energetskoj učinkovitosti, to možda neće biti slučaj u mnogim zemljama u razvoju. Industrijalizacija, urbanizacija i gospodarski razvoj u zemljama u razvoju i dalje će dovoditi do veće potražnje za energijom, koju će vjerojatno u određenoj razini zadovoljiti fosilna goriva (Berahab, 2020).

Razvijene zemlje, poput SAD-a (63%), Njemačke (63%) i Francuske (62%), su na vrhu po dekarbonizaciji fosilnih goriva radi svojih učinkovitih i opsežnih poticaja za prelazak na niskougljična goriva. S druge strane, zemlje u razvoju, poput Ruske Federacije (11%), Turske (19%) i Meksika (25%), imaju znatno slabiji rezultat u dekarbonizaciji fosilnih goriva. Isto tako, postoje i iznimke, primjerice Brazil, koji je zemlja u razvoju, nalazi se na visokom četvrtom mjestu (60%) zbog poticaja u obliku ciljeva ili propisa na strani potražnje, dok Saudijske Arabija, kao razvijena zemlja, je među posljednjim mjestima (19%). Neke zemlje također bilježe manji rast zbog nedostatka ambicija ili usklađenosti (REGlobal, 2021). Ako predviđanja pokazuju da emisije CO_2 povezane s energijom, u naprednim zemljama općenito opadaju za 3,6 Gt do 2050. godine, za zemlje u razvoju, osobito u Aziji, očekuje se njihovo povećanje. Prema Međunarodnoj agenciji za energiju, gotovo sav neto rast emisije ugljikovog dioksida će u sljedeća dva desetljeća doći s tržišta u razvoju. Kako bi se to moglo riješiti, nužna je pomoć od strane razvijenih zemalja zemljama u razvoju. Jedno od rješenja je stvaranje Svjetske banke ugljika koja bi prenosila i koordinirala podršku i tehničku pomoć kako bi pomogla zemljama u razvoju u samom procesu dekarbonizacije (Rogoff, 2021).

Postizanje energetske tranzicije potrebnim tempom i opsegom zahtijevat će gotovo potpunu dekarbonizaciju elektroenergetskog sektora do 2050. godine. Prema podacima izvješća Međunarodne agencije za obnovljivu energiju, potrošnja električne energije u sektorima krajnje potrošnje udvostručila bi se do 2050., u odnosu na 2015., na više od 42.000 TWh, dok bi se intenzitet ugljika u energetskom sektoru smanjio za visokih 85%. Do 2050. godine, udio obnovljivih izvora energije u proizvodnji iznosio bi 85%, u usporedbi s procijenjenih 24% u 2015. Prevladavat će solarne elektrane i vjetroelektrane, povećavajući se sa 1% i 3,5% u 2015. na oko 22% i 36% do 2050., što pokriva gotovo 60% obnovljivih izvora energije. Osim toga, geotermalna proizvodnja, bioenergija i hidroenergija će se u tom razdoblju povećati za 800 GW. Godišnje povećanje instaliranih kapaciteta obnovljive energije udvostručilo bi se na oko 400 GW godišnje, od čega bi 80% bile varijabilne proizvodne tehnologije, poput sunca i vjetra. Decentralizirana proizvodnja energije iz obnovljivih izvora raste sa samo 2% ukupne proizvodnje na 21% do 2050. godine, što je deset puta više (IRENA, 2018).

Nove elektrane na ugljen ne bi trebale biti puštene u rad, a 95% elektrana koje danas rade trebale bi se zatvoriti. Jedino fosilno gorivo koje bi do 2050. jednim dijelom opskrbljivalo energijom je prirodni plin (10%). Očekuje se da će se ulaganja u nove kapacitete obnovljive energije povećati do gotovo 500 milijardi USD godišnje do 2050. godine. Stvaranje elektroenergetskog sustava s 85% obnovljive energije zahtijevat će ulaganja u infrastrukturu i energetsku fleksibilnost od dodatnih 500 milijardi USD godišnje, odnosno 250 milijardi USD godišnje više nego obično. Sveukupno, ulaganja u dekarbonizaciju elektroenergetskog sustava trebat će doseći gotovo 1 bilijun USD godišnje do 2050. godine, kako bi sam proces bio što uspješniji (IRENA, 2018).

S obzirom na 2020. godinu, kratkoročno pad potražnje za energijom rezultirao je velikim padom globalne emisije CO_2, nadmašujući sva prethodna smanjenja. Nakon što su desetljećima stalno rasle, globalne emisije ugljikovog dioksida pale su za 6,4%, odnosno 2,3 milijarde tona

2020. godine zbog Covid-19 pandemije, koja je potisnula gospodarske i društvene aktivnosti u svijetu (Tollefson, 2021). Međutim, svako smanjenje emisija stakleničkih plinova i ne-stakleničkih plinova najvjerojatnije je dugoročno neodrživo ako ne dođe do pomaka prema zelenom oporavku. Doista, ta smanjenja nisu rezultat usvajanja novih politika i strategija od strane vlada i tvrtki, već su neposredni rezultat egzogenog šoka, koji ima ozbiljne posljedice po zdravlje i gospodarsku aktivnost pojedinaca (Berahab, 2020). Iz tog razloga, važno je nastaviti provoditi ciljeve promicanja obnovljive energije, digitalizacije mrežne strukture, uspostavljanja mehanizama kapaciteta te poticanja učinkovitog skladištenja energije, kako bi proces dekarbonizacije bio što uspješniji i kako bi se staklenički plinovi i ostala zagađenja minimalizirala do 2050. godine te na taj način smanjile klimatske promjene.

2.4. Decentralizacija i digitalizacija energetskog sektora

Decentralizacija energetskog sektora podrazumijeva prijelaz s klasičnog modela distribucije električne energije iz velikih centralnih elektrana na model u kojem su i potrošači proizvođači. Također, decentralizacija se može koristiti kao dodatna mjera postojećem centraliziranom energetskom sustavu. Kod decentralizacije energetskog sustava, karakteristično je lociranje objekata za proizvodnju energije bliže mjestu potrošnje energije. Decentralizirani energetski sustav omogućuje optimalnije korištenje obnovljive energije, kao i kombiniranu toplinu i energiju, olakšava skladištenje energije, smanjuje gubitke u prijenosu energije te smanjuje uporabu fosilnih goriva i povećava ekološku učinkovitost. Iz tog razloga, decentralizacija bi mogla imati vrlo važnu ulogu u smanjenju emisija stakleničkih plinova i ubrzavanju procesa dekarbonizacije. Isto tako, ima potencijal pojačati energetsku sigurnost, na način da umanji pritisak na mrežu u vrijeme najvećih opterećenja i u budućnosti, na način da podržava lokalizirane „mikromreže“ koje se po potrebi mogu isključiti iz glavne mreže (International Energy Forum, 2021).

Decentralizirani energetski sustav relativno je novi pristup u energetskom sektoru u većini zemalja. Tradicionalno, energetska industrija usredotočila se na razvoj velikih, centralnih elektrana i prijenos električne energije preko dugih prijenosnih i distribucijskih vodova do potrošača u regiji. Decentralizirani energetski sustavi nastoje izvore energije približiti krajnjem potrošaču. Krajnji potrošači raširenu su po cijeloj regiji, pa nabava energije na decentraliziran način može smanjiti neučinkovitost prijenosa i distribucije i povezane ekonomske i ekološke troškove. Decentralizacija u energetskom sektoru povećat će se u narednom desetljeću i to osobito u regijama koje još uvijek nemaju nikakav ili imaju slab pristup električnoj energiji, poput Afrike. Naime, procjenjuje se da 1,2 milijarde ljudi nema pristup električnoj energiji, a sličan broj ima neadekvatan pristup, bez dostupnih ekonomskih isplativih zamjena za energiju. Sukladno tome, decentralizacija putem minimreža je primarno rješenje za veliki problem energetskog siromaštva, uz integriranje velikih količina obnovljive energije kako se emisije CO_2 ne bi povećale u podmirivanju rastućih potreba za energijom (Breecker, 2018).

U razvijenim zemljama, primarni ciljevi koji pokreću decentralizaciju energije su tendencija za otpornošću prilikom ekstremnih vremenskih uvjeta; cyberterorizam i posebice potreba za većom održivošću, kroz integraciju velikih količina distribuirane obnovljive energije i drugih energetskih resursa (Breecker, 2018). Očekuje se da će energetski resursi, poput solarnih baterija, malih baterija, električnih vozila, pametnih uređaja i slično, u kombinaciji s rastućom potražnjom na razini distribucijske mreže pružati sve veću decentralizaciju u budućem energetskom sektoru (Henbest, 2017). Australija je već od 2012. godine jedan od najdecentraliziranijih energetskih sustava u svijetu te smatra se da će do 2040. godine imati čak 45% ukupnih kapaciteta.

S obzirom na trenutnu rastuću krivulju, predviđa se da će Meksiko, Japan, Brazil i Njemačka vjerojatno imati omjer decentralizacije veći od 30%.

Iako se i ovaj trend nosi s brojnim izazovima, poput brojnih pravnih i administrativnih prepreka i kontrola države koje koče razvoj decentralizacije, razvoja tehnologija u nastajanju (npr. pametne mreže) koje zahtijevaju preoblikovanje i modifikaciju energetskih sustava i pouzdane internetske mreže, visokih kapitalnih troškova itd., postoje brojni čimbenici kojima je ovaj trend potaknut. Čimbenici kojima je decentralizacija potaknuta su pad troškova tehnologija obnovljivih izvora energije (koje su inače važna značajka distribuiranih mreža), pojava novih tehnologija (koje su istodobno i izazov decentralizaciji) za učinkovito upravljanje distribuiranim mrežama i činjenica da su decentralizirani sustavi u nekim slučajevima puno isplativiji od centraliziranih mreža (posebice u područjima s malom gustoćom naseljenosti). Prema tome, u sljedećem desetljeću se nastoji primjenjivati zamjene centraliziranih mreža decentraliziranom, kada je to isplativo, dok se u isto vrijeme razvijaju tehnologije za distribuirano upravljanje mrežom (Berahab, 2020). Kako bi se iskoristile sve mogućnosti decentralizacije, ključno je ulaganje u tehnologiju i digitalizaciju, što je još jedan od novih trendova koji se pojavljuju u energetskom sektoru. Energetski sektor je trenutno u dubokoj tranziciji prema vrlo važnoj energetskoj transformaciji, a digitalizacija je jedan od ključnih pomagača koji osigurava njezino ispunjenje. Digitalizacija pomaže poboljšati produktivnost, povezanost, sigurnost, pristupačnost i održivost energetskih sustava u cijelom svijetu (IEA, 2017).

Međutim, s digitalizacijom rastu i rizici, poput sigurnosti i privatnosti. Digitalna transformacija energetskog sektora je puno dublja i opsežnija u odnosu na druge sektore, što može biti potencijal za promjenu svjetskog energetskog krajolika. Ona mijenja tržišta, poduzeća, zaposlenost i same poslovne modele. Također, može ostvariti tri ishoda, a to su duboka dekarbonizacija energetskog sektora, poboljšana učinkovitost i osnaživanje kupaca. Trendovi digitalizacije su u posljednjih nekoliko godina sve zadivljujući. Digitalne tehnologije uključuju nove izvore podataka i komunikacija, poboljšane alate za analizu i vizualizaciju informacija i donošenje odluka te automatizaciju i kontrolu. Prikupljanje i razmjena podataka rastu eksponencijalnom brzinom. Veliku količinu prikupljenih i analiziranih podataka pokreće Internet stvari (IoT). Internet stvari se odnosi na ogromnu mrežu povezanih elektroničkih uređaja, poput mobitela, računala, pametnih mjerača itd. IoT uređaji pomažu potrošačima da učinkovitije upotrebljavaju energiju, pritom smanjujući troškove, ali i emisije ugljika. Primjerice, pametni termostat uključuje toplinu za grijanje samo kada je to potrebno, dok pametna perilica može raditi ako je na raspolaganju dovoljno obnovljive energije (International Energy Forum, 2021). Energetska industrija također ima koristi od uporabe povezanih uređaja za upravljanje potražnjom i praćenje opreme. Pristup podacima u stvarnom vremenu kroz mrežu omogućit će dobavljačima da vrlo brzo i precizno odgovore na promjene potražnje, udovoljavajući rastućoj potražnji uz minimiziranje rasipanja. Ovo je bitan korak za ispunjavanje klimatskih obveza. Isto tako, postavljanje senzora u energetsku infrastrukturu omogućuje praćenje u stvarnom vremenu, pritom smanjujući rizik od ometanja i opasnog kvara opreme. IoT sadrži i podatke koji potiču stvaranje utjecajnih alata za predviđanje. Tako alati za strojno učenje uče prepoznati obrasce u podacima i na taj način generirati predviđanja. Predviđanje kapaciteta obnovljivih izvora, pomoću vremenske prognoze, osigurava planiranje na temelju stohastičkih resursa kao što je to vjetar, te na taj način omogućuje obnovljivim izvorima energije da se natječu s konzistentnim izvorima energije. Sve više energetskih kompanija eksperimentira sa sofisticiranim računalnim modelima, koje nazivaju digitalnim blizancima, koji repliciraju sustav, često dobiven podacima u stvarnom vremenu. Oni omogućuju daljinsko praćenje imovine, od jedne vjetroturbine do cijele mreže, ali su i kreativni alati za inženjering (International Energy Forum, 2021). Također, veliki napredak postigla je

i umjetna inteligencija. Primjerice, umjetna inteligencija može digitalnim energetskim sustavima omogućiti daljinsko upravljanje potražnjom za električnom energijom. Takav slučaj već postoji u pojedinim afričkim zemljama, gdje dobavljači energije kontroliraju solarne kućne sustave kako bi energiju isporučili u pravo vrijeme, na pravom mjestu i uz najniže troškove. Prema tome se može uočiti sve veća uloga potrošača u distribuciji energije (Berahab, 2020).

Tempo digitalizacije u energetskom sektoru konstantno raste. Ulaganja energetskih kompanija u digitalne tehnologije intenzivno su porasla u posljednjih nekoliko godina. Tako su primjerice, globalna ulaganja u digitalnu električnu infrastrukturu porasla za više od 20% godišnje od 2014. godine, dosegavši 47 milijardi USD u 2016. godini. Tako je digitalno ulaganje u 2016. godini bilo gotovo 40% veće od ulaganja u svjetsku proizvodnju električne energije na plin (34 milijarde USD), pri čemu se može zaključiti koliko je zapravo digitalizacija važna komponenta energetskog sektora (IEA, 2017). Primjerice, u razdoblju od 2014. do 2019. godine, infrastruktura za punjenje električnih vozila (EV chargers), infrastruktura pametne mreže (Smart grid infrastructure) te pametna brojila (Smart meters) su se znatno povećali tijekom promatranog razdoblja, i sa 40 milijardi USD čine više od 15% ukupne potrošnje. U budućnosti se očekuje nastavak rasta digitalne tehnologije bez obzira na pad koji je ostvaren 2020. godine zbog Covid-19 pandemije, koja je stopirala većinu ulaganja u energetskom sektoru, pa tako i u području digitalizacije (Henriot, Munuera i Warichet, 2021).

2.5. Fleksibilnost energetskog sustava

Energetski sustavi moraju stalno usklađivati ponudu i potražnju, što se naziva uravnoteženje energije. Shodno tome, fleksibilnost energetskog sustava je sposobnost prilagodbe ponude i potražnje kako bi se ostvarila ta energetska ravnoteža. Kako bi se energija isporučila s određenog mjesta mora se na neki način transportirati. Transportirati se može u nacionalnim sustavima, poput električnih ili plinskih mreža ili u tankerima koji prevoze gorivo po cijelom svijetu. S obzirom da ponuda i potražnja za energijom variraju, moguće fluktuacije je teško predvidjeti, što znači da će ponekad biti i izvan ravnoteže. Potražnja za energijom oscilira zbog nekoliko razloga, uključujući dnevne i sezonske varijacije s temperaturom i vremenskim uvjetima, kratkoročne skokove cijena roba, dugoročne trendove energetske učinkovitosti ili situacije poput Covid-19 pandemije u 2020. godini. S druge strane, ponuda energije fluktuira zbog raspoloživosti obnovljive energije ili uvoza goriva (nafte, ugljena i prirodnog plina). Postoje i drugi čimbenici koji, isto tako, mogu prouzročiti neusklađenost ponude i potražnje, kao što su ograničenja mreže; zastoji u proizvodnji ili pogreške u predviđanju. Iz tog razloga, fleksibilnost pomaže osigurati da se ponuda i potražnja vremenski točno podudaraju, što je u današnje vrijeme izrazito važno te se smatra temeljem sigurnosti energije.

Fleksibilnost će u budućnosti postati još važnija zbog određenih čimbenika, poput rasta razine proizvodnje obnovljive energije, promjena u ponašanju potrošača ili povećane elektrifikacije topline i transporta, pomoću kojih će i ispunjavati klimatske ciljeve. Isto tako, bit će jedan od ključnih energetskih trendova zbog usklađivanja ponude i potražnje, prilikom znatnog povećanja potražnje koja se očekuje u budućnosti i manje količine slobodnog kapaciteta na mreži u vrijeme najvećih opterećenja. Primjerice, sve veća uporaba obnovljivih izvora energije u svijetu zahtijevat će znatno veću fleksibilnost zbog isprekidane prirode obnovljivih izvora, koji mogu dovesti do velikih fluktuacija na tržištu ukoliko sustav nije fleksibilan. Iz tog razloga, pouzdanost energije će predstavljati veliku brigu u svijetu, stoga je nužno konstantno razvijati i usavršavati sustav fleksibilnosti kako ne bi došlo do većih nepravilnosti na tržištu. Veliku ulogu u

unaprjeđivanju imaju kreatori politika koji moraju uvoditi odgovarajuće mjere za primjenu fleksibilnosti energetskih sustava, što zahtijeva dubok i promišljen pogled na institucionalni okvir svake zemlje (Berahab, 2020).

S obzirom da se energetski sustavi sve više odmiču od tradicionalnih izvora energije (fosilnih goriva) prema obnovljivim izvorima energije i plinovima s niskim udjelom ugljika (vodik), fleksibilnost će se uvelike promijeniti. Potražnja za električnom energijom će značajno rasti iz godine u godinu te kako bi odgovorili na njezine zahtjeve potrebno je uvođenje odgovarajućih tehnologija i alternativnih kapaciteta koji će imati sposobnost upravljanja isprekidanošću obnovljivih izvora energije. Tako se prema IEA (2017), prognozira sve veća potreba za fleksibilnošću u svim regijama svijeta do 2040. godine. Neka će tržišta biti privlačnija od drugih, ovisno o mnogim varijablama, uključujući mješavinu kapaciteta, dizajn tržišta i regulatornu fleksibilnost, raspoložive poticaje za obnovljivu proizvodnju i distribucijsku imovinu, cijene električne energije i dr. Smatra se da će rast potreba za fleksibilnošću u 2040. godini doseći do gotovo 600% (u odnosu na potrebe iz 2018. godine).

Kako bi se odgovorilo na zahtjeve rastuće potražnje, potrebno je unaprijediti fleksibilnost energetskih sustava, a to je moguće pokretanjem reformi koje bi potaknule razvoj investicija. U nastavku je opisano i objašnjeno nekoliko tehnologija koje će u budućnosti imati zasigurno veliku ulogu u fleksibilnosti sustava, ali i u procesu ispunjavanja neto nula emisija.

Jedan od važnih izvora fleksibilnosti u mnogim regijama bio je prirodni plin, međutim, potrebne su alternative koje su ekološki prihvatljivije. Primjerice, baterije pružaju fleksibilnost i brzi su odgovor na rastuću potražnju te na taj način mogu doprinijeti ravnoteži električne energije. One omogućavaju da se električna energija, proizvedena iz obnovljivih izvora, pohranjuje i doprema u mrežu kada je to potrebno, odnosno kada su potrebe sustava veće. Predviđa se da će u narednih deset godina skladištenje baterija biti jedan od najbrže rastućih izvora fleksibilnosti energetskog sustava, zahvaljujući poboljšanjima tehnologije i ekonomiji obujma. S obzirom na razvoj tehnologija, očekuje se da će se troškovi pohranjivanja baterija upola smanjiti do 2030. godine, sa 400 USD/KWh, na otprilike 200 USD/KWh za četverosatni sustav skladištenja. Predvodnice u implementaciji prostora za skladištenje baterija vjerojatno će voditi Kina, Indija i SAD (Berahab, 2020). Uz baterije, u posljednjih nekoliko godina pojavili su se i drugi izvori fleksibilnosti, kao što su odgovori na strani potražnje, koji smanjuju vrhove potražnje i omogućuju preraspodjelu električne energije u periodima nižeg naboja i jeftinije električne energije. Primjer takvih izvora fleksibilnosti jesu vodik i Power-to-X. To je tehnologija transformacije koja transformira električnu energiju u ugljično neutralna sintetička goriva, koja se zatim mogu koristiti u drugim sektorima ili skladištiti, dok ne dođe do potrebe za njezinom uporabom (Berahab, 2020). Najprije se električna energija iz obnovljivih izvora energije (vjetar, sunce), pomoću elektrolizatora, pretvara u zeleni vodik. Uz Power-to-X, vodik se može dalje transformirati u sintetički prirodni plin, koji može služiti za napajanje elektrana, ili u metan za industrijske procese ili druga sintetička goriva, ovisno o sektoru. To je izrazito učinkovita tehnologija jer širi dobrobit ugljično neutralne energije po sektorima te međusobno ih povezuje s energetskim sektorom i na taj način pridonosi i ubrzava proces dekarbonizacije. Međutim, Power-to-X je relativno nova i skupa tehnologija, stoga su potrebne daljnje investicije kako bi se ostvario veći tehnološki napredak s kojim bi ona postala troškovno konkurentnija. Jedan od najvećih potencijala za proizvodnju vodika u svijetu ima Afrika. Prognozira se da će do 2030. godine troškovi proizvodnje vodika u sjevernoj Africi biti dva do tri puta niži u odnosu na europske zemlje i Japan. S obzirom da zeleni vodik ima mnoge prednosti, od lakog skladištenja, pričuvne snage do izvora energije koji se može koristiti u bilo kojem sektoru, a uz to

je i ugljično neutralan, smatra se da će u budućnosti postati jedan od najvažnijih i najfleksibilnijih izvora energije (Berahab, 2020). Ulogu u osiguravanju fleksibilnosti energetskog sustava imat će i električna vozila (EV). Naime, brojne analize pokazuju kako će potencijalni električni motori, unutar električnih vozila, imati značajan mrežni resurs. Taj resurs će imati mogućnost pružanja brze fleksibilnosti kako bi podržao proizvodnju obnovljivih izvora energije te na taj način uravnotežio ponudu i potražnju električne energije te reducirao opterećenje mreže na lokalnoj i nacionalnoj razini, bez utjecaja vozača. Utvrđeno je da bi do 2030. godine (s procijenjenih 9 milijuna električnih vozila) moglo postojati oko 3 GW fleksibilnosti pri uključivanju u različito doba dana te oko 8 GW fleksibilnosti pri zaključavanju, koje bi pametno punjenje otključalo. Automobili, dakle, bi mogli pomoći u apsorpciji energije tijekom razdoblja prekomjerne ponude i umanjivanju potražnje u razdobljima premale ponude, što bi bila budućnost održive energije i prometa (Open Energi, 2021).

Važno je napomenuti da je fleksibilnost jedan od ključnih trendova koji će imati veliku ulogu u budućnosti energetskog sektora i ostvarivanju klimatskih ciljeva. S obzirom da se svijet sve više oslanja na varijabilne i distribuirane oblike proizvodnje energije, neophodno je unaprijediti fleksibilnost putem odgovarajućih ulaganja u određene tehnologije i kapacitete. Pojava Covid-19 krize bila je pravi pokazatelj koliko je nužna fleksibilnost energetskih sustava. Naime, pandemija je dovela do globalnog pada potražnje za energijom, s obzirom da se gospodarska aktivnost u svijetu uvelike smanjila. Primjerice, u Južnoj Africi potražnja se smanjila u prosjeku za čak 7500 MW u ožujku i travnju 2020. godine, stoga su elektrane prestale s radom kako bi sustav ostao stabilan. Nedugo nakon toga, potražnja se u većini zemalja oporavila, s ponovnim otvaranjem gospodarstava. To je naposljetku rezultiralo nedostatkom opskrbe energije zbog čega su države morale nabaviti više energije u narednim mjesecima. Najbrži i najisplativiji način opskrbe bi bio kroz fleksibilne tehnologije, prvenstveno obnovljive izvore energije. Zaključak je kako bi zemlje trebale donositi određene reforme kojima bi diverzificirale postojeće tehnološke mješavine i tako osigurale veću fleksibilnost opskrbe u budućnosti (Energy Net, 2020).

2.6. Blockchain tehnologije

Blockchain je tehnologija za pohranu i prijenos informacija, koja je ujedno sigurna i transparentna te djeluje bez središnjeg nadzornog tijela. To je baza podataka koja sadrži povijest svih razmjena između njegovih korisnika od njegovog stvaranja. Sigurna je baza podataka koju dijele različiti korisnici, bez posrednika ili trećih strana i to na decentraliziran način, dopuštajući svakom korisniku da provjeri valjanost lanca. Ova tehnologija ima veliki potencijal transformirati energetski sektor. Blockchain je probojni mehanizam povjerenja koji može ukloniti potrebu za skupim posrednicima i omogućiti neviđenu razinu transparentnosti, koordinacije i razmjene informacija u energetskom sektoru, dok istodobno omogućuje kompanijama da zadrže kontrolu nad osjetljivim podacima, koji im daju konkurentsku prednost na tržištu. Primjerice, naftne i plinske kompanije su osobito zabrinute zbog privatnosti i poslovnih tajni. Privatne blockchain mreže nude dopuštenje podataka i selektivni pristup prethodno odobrenim stranama. Privatne blockchain mreže daju privremeno rješenje, dok javne blockchain mreže ne mogu implementirati potrebne značajke privatnosti koje kompanije zahtijevaju. Blockchainovi nafte i plina na energetskim tržištima svjedočit će i značajnom porastu radi manjih posredničkih troškova, ograničenih režijskih troškova i kraćeg vremena gotovinskog ciklusa.

Naime, blockchain ima golemi potencijal za poboljšanje učinkovitosti i djelotvornosti, pritom stvarajući vrijednosti za cijeli energetski sektor. Posebnost blockchaina je u tome što omogućuje

transakciju između dvije strane, ali zaobilazi treću stranu, koja je prisutna kako bi se uspostavilo povjerenje između te dvije strane i za tu uslugu je naravno plaćena. Institucije kao što su banke, odvjetnička društva ili komunalne službe općenito su uvijek prisutne kao treća strana, međutim, blockchain takav pristup zaobilazi. Iz tog razloga, on može izmijeniti platforme za trgovanje električnom energijom na još neviđen način. Primjerice, putem blockchaina, korisnici koji se opskrbljuju električnom energijom, dobivenom iz obnovljivih izvora energije, imat će mogućnost svoj višak energije prodati susjedima, što je potpuno nova koncepcija funkcioniranja energetskog tržišta. Na taj način, ljudi odnosno potrošači stavljaju kontrolu u svoje ruke, a ne u ruke onih koji je opskrbljuju (Vlahinić Lenz, Živković i Gržeta, 2019, str. 374). Također, to stvara veći poticaj prema projektima obnovljive energije jer se tako proizvođači energije vjetra, solarne energije i hidroenergije mogu lakše povezati sa investitorima i to čini distribuirani sustav koji omogućuje eliminiranje posrednika. Uz to, blockchain tehnologija omogućuje proizvođačima energije da zarade više putem izdavanja energetskih žetona koji se mogu potrošiti ili preprodati, stvarajući na taj način čistu, višedimenzionalnu mrežu.

Još jedna prednost blockchain tehnologija jesu pametni ugovori, koji imaju potencijal učiniti isporuku energije s jednog kraja na drugi kraj jednostavnijom i efikasnijom. U to se podrazumijeva računovodstvo emisija i jamstvo da su zalihe energije dolazile iz izvora koji su naznačeni u ugovoru. Izvršena razmjena može se automatski potvrditi i zabilježiti u blockchainu, što značajno smanjuje kašnjenja i troškove namirivanja. Blockchain bi bio dobra opcija za tržišta u razvoju, za promicanje transparentnosti, omogućavanja lakših i bržih transakcija te stjecanje financiranja. S obzirom da je ta tehnologija relativno nova i u sazrijevanju, trenutno nije dovoljno robusna da podrži velika tržišta. Očekuje se da će blockchain tehnologije na energetskom tržištu, u privatnoj kategoriji, porasti za 45% do 2025. godine. Tržišna vrijednost, prema prognozama, će porasti na 3 milijarde USD u 2025. godini (Nhede, 2019). Naime, rastuća zabrinutost za sigurnost mreža te za povećanje međupovezivanja i digitalizacije potaknut će rast blockchaina na energetskim tržištim. Predviđa se znatan porast blockchain tehnologija u 2025. godini (u odnosu na 2018. godinu). U 2025. godini najveći porast, od gotovo 60%, imat će Peer to Peer Transactions odnosno transakcije od osobe do osobe. Uz njih, značajan porast zabilježit će i Grid Transactions odnosno mrežne transakcije, nešto manje od 50%. Ostale tehnologije će također imati porast u rasponu od 10% do 20%, što je (u odnosu na 2018. godinu) izrazito visoko. Prema tome, zaključuje se kako će blockchain tehnologije biti jedan od rastućih i iznimno značajnih trendova u ovom desetljeću. Dakle, blockchain potiče decentralizaciju energije, gdje se energija može doslovno izmijeniti između susjeda, što ujedno stabilizira mrežu i sustav čini fleksibilnijim. Uz to, promiče transparentnost i omogućuje jeftiniju i bržu mrežu, bez troškova posrednika, s niskim udjelom ugljika te tako pomaže u procesu dekarbonizacije te smanjenju zagađenja.

3. ZAKLJUČAK

U modernom svijetu, potražnja za energijom globalno raste iz dana u dan kako bi svaka zemlja mogla zadovoljiti svoje energetske potrebe. Ona opskrbljuje gospodarstvo i osnažuje mnoge usluge o kojima ovisimo te se može reći kako je energija osnova današnjeg visoko tehnički razvijenog svijeta. Dakle, energija pokreće ekonomiju odnosno pokreće industriju, transport, prometnu infrastrukturu i sve ostale sektore. S druge strane, ekonomija omogućuje uspostavu potrebne energetske strukture - od vađenja potrebnih resursa do tehnologija za proizvodnju energenata i opreme za krajnju uporabu te za pružanje željenih energetskih usluga. Također, ona financira energetske sustave i energetske tokove kako bi oni nesmetano funkcionirali te na taj način povećali društveni razvoj i blagostanje. Mnogi smatraju kako je energija ključan izvor gospodarskog rasta jer mnoge

aktivnosti proizvodnje i potrošnje upotrebljavaju energiju kao osnovni input. Većina energije danas dolazi iz fosilnih goriva odnosno nafte, ugljena i prirodnog plina koji pokrivaju oko 9/10 energetskih potreba u svijetu. Međutim, izgaranjem fosilnih goriva nastaje ugljikov dioksid (CO_2) koji se zatim ispušta u atmosferu, što dovodi do velikih klimatskih promjena, rasta prosječne temperature na Zemlji i mnogih drugih negativnih posljedica. Isto tako, fosilna goriva su neobnovljivi izvori, što znači da kada se jednom u potpunosti istroše u svijetu, više se ne mogu povratiti, stoga je potrebno pronaći alternativno rješenje. Može se reći da su to jedni od najvećih svjetskih problema današnjice zbog čega se moderna energetika sve više okreće čistim izvorima energije koji imaju vrlo mali utjecaj na okoliš, poput obnovljivih izvora. Put energetske tranzicije, odnosno prijelaz iz fosilnih goriva na obnovljive izvore energije, uvelike ubrzavaju određeni izvori, procesi i tehnologije koji se sve više promiču u svijetu te se nazivaju energetskim trendovima. Energetski trendovi, za koje se očekuje da će promijeniti budućnost energetskog sektora, su obnovljivi izvori energije, plin iz škriljevca, proces dekarbonizacije, decentralizacija i digitalizacija, fleksibilnost energetskih sustava i blockchain tehnologije. Važno je istaknuti kako su svi navedeni trendovi međusobno povezani te svi imaju značajnu ulogu u transformaciji energetskog sektora, stoga je ključno ulagati u njih kako bi se što prije razvili i na taj način ubrzali rješavanje klimatskih problema, što je trenutno globalni prioritet.

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Utjecaj energetskih trendova na globalnu ekonomiju

The Influence of Energy Trends on the Global Economy

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COVID-19

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Sažetak: *Energija potiče globalnu gospodarsku aktivnost, koja je ujedno ključni input za gotovo svu robu i usluge modernog svijeta. S obzirom na širenje stanovništva, poboljšanje životnog standarda i porast potrošnje, ukupna potražnja za energijom iz godine u godinu bilježi sve veći rast. U isto vrijeme, prisutna je i velika zabrinutost zbog klimatskih promjena, koja potiče zemlje diljem svijeta da nađu rješenja za opskrbu energijom uz smanjenje emisije stakleničkih plinova i ostalih zagađenja koji ugrožavaju okoliš. Energetski trendovi, poput obnovljivih izvora energije, plina, dekarbonizacije, decentralizacije, fleksibilnosti i blockchain tehnologije, omogućuju bržu i jednostavniju energetsku transformaciju, smanjuju negativne utjecaje klimatskih promjena, pojačavaju energetsku sigurnost i daju širi pristup energiji. Iz tog razloga, u radu je analiziran utjecaj energetskih trendova na svjetske velesile odnosno SAD, Kinu i Europsku uniju (EU), te na zemlje regije MENA (zemlje Bliskog istoka i Sjeverne Afrike), koje su jedne od najvećih svjetskih proizvođača energije. U radu je također dan osvrt na COVID-19 pandemiju koja je dovela do neviđenog pada potražnje za energijom i usporila razvoj svjetskog energetskog sektora.*

Abstract: *Energy stimulates global economic activity, which is also a key input for almost all goods and services of the modern world. Given the expansion of the population, the improvement of living standards and the increase in consumption, the total demand for energy is growing year by year. At the same time, there is great concern about climate change, which encourages countries around the world to find solutions for energy supply while reducing greenhouse gas emissions and other pollutants that threaten the environment. Energy trends, such as renewable energy, gas, decarbonization, decentralization, flexibility and blockchain technology, enable faster and simpler energy transformation, reduce the negative impacts of climate change, enhance energy security and provide wider access to energy. For this reason, the paper analyzes the impact of energy trends on the superpowers, i.e. the USA, China and the European Union (EU), and on the countries of the MENA region (Middle East and North Africa), which are one of the world's largest energy producers. The paper also reviews the COVID-19 pandemic, which has led to an unprecedented decline in energy demand and slowed the development of the global energy sector.*

1. UVOD

Globalni energetski sektor doživio je velike prijelaze u povijesti, od korištenja drva kao dominantnog energetskog resursa do usvajanja ugljena krajem 19. stoljeća te, u novije vrijeme, nafte. Početkom 21. stoljeća, plin je rastao brže nego bilo koje drugo fosilno gorivo, a u današnje vrijeme „čisti" izvori energije i njihove tehnologije rastu još brže. Brojni izazovi u kombinaciji s promjenjivim cijenama energije i povremenim šokovima, stvaraju složene scenarije za budućnost energetskog sektora u svijetu. Takvo pružanje dostatne količine energije, za zadovoljavanje zahtjeva rastućeg svjetskog stanovništva, predstavlja velik izazov koji zahtijeva veliki napredak u opskrbi energijom i energetskoj učinkovitosti. Danas znatna količina energije dolazi iz fosilnih goriva odnosno nafte, ugljena i prirodnog plina koji pokrivaju gotovo većinu energetskih potreba u svijetu, a pomoću kojih se zadovoljava većina svjetske potražnje. Međutim, fosilna goriva su neobnovljivi izvori energije, što znači da će biti nepovratno iskorišteni kada se jednom u potpunosti "izvade" i iskoriste. Osim toga, izgaranjem fosilnih goriva nastaju emisije stakleničkih plinova koji dovode do velikih klimatskih promjena i brojnih negativnih posljedica što je jedan od najvećih svjetskih problema današnjice. Zadovoljavanje stalno rastuće svjetske potražnje, uz umanjivanje rizika od klimatskih poremećaja, predstavlja izazovan pothvat u današnjem svijetu. To zahtijeva značajan pomak u povijesnom obrascu uporabe fosilnih goriva i veliku transformaciju svjetskog energetskog sektora.

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U sadašnjem procesu energetske transformacije važnu ulogu imaju nove politike, tehnologije i izvori koji čine nove energetske trendove i koji polako, ali sigurno, mijenjaju budućnost energetskog krajolika. Najznačajniji trendovi koji se pojavljuju posljednjih nekoliko godina su obnovljivi izvori, plin iz škriljevca, dekarbonizacija, decentralizacija i digitalizacija energetskog sektora te fleksibilnost energetskih sustava i blockchain tehnologije. Oni omogućuju bržu i jednostavniju energetsku transformaciju, smanjuju negativne utjecaje klimatskih promjena, pojačavaju energetsku sigurnost i daju širi pristup energiji.

Osim što značajno doprinose u ispunjavanju klimatskih ciljeva, energetski trendovi dovode i do brojnih ekonomskih koristi, poput gospodarskog rasta i porasta zaposlenosti, što je u nastavku rada prikazano kroz primjere nekoliko zemalja (SAD, Kina, EU) i regija (MENA). Također, svijet je u 2020. godini zahvatila Covid-19 pandemija koja je donijela velike neprilike u većini zemalja, pritom uzrokujući globalnu ekonomsku i društvenu krizu bez presedana. Na kraju, ovaj članak ukratko se dotaknuo spomenute Covid-19 pandemije te njezinog značajnog utjecaja na sve aspekte života pa tako i na svjetski energetski sektor (npr. smanjenje potražnje, financijski stres i poremećaje u lancu opskrbe električnom energijom) te aktualne energetske trendove.

2. UČINCI ENERGETSKIH TRENDOVA NA SAD, KINU I EU

Sjedinjene Američke Države (SAD) su među najvećim proizvođačima i potrošačima energije u svijetu. Američke energetske kompanije proizvode naftu, prirodni plin (najveći svjetski proizvođači), ugljen, električnu energiju iz obnovljivih izvora energije, uključujući hidroenergiju, vjetar, solarnu energiju, geotermalnu i nuklearnu energiju. Dobivenu energiju kompanije dalje prenose, distribuiraju i skladište putem složenih infrastrukturnih mreža. Naime, mreže su implementirane novim tehnologijama i uslugama, poput tehnologija pametnih mreža, što već upućuje na znatan utjecaj trendova u američkom energetskom sektoru. SAD su jedan od najatraktivnijih svjetskih energetskih tržišta, s obzirom na rastuću potražnju i velika ulaganja u energetsku tehnologiju. Rekordna ulaganja u američki energetski sektor zabilježena su u 2018. godini u iznosu od 350 milijardi USD te su time zauzeli drugo mjesto u svijetu po ulaganjima (EIA, 2021).

SAD ima vrlo uspješnu i rastuću industriju obnovljivih izvora energije, s globalno konkurentnim kompanijama u gotovo svim tehnološkim podsektorima, obuhvaćajući hidroenergiju, energiju vjetra, solarnu energiju, geotermalnu energiju, biogoriva te biomasu. SAD imaju jedan od najvećih kapaciteta obnovljive energije na svijetu, primjerice imaju najveći geotermalni kapacitet (3,7 GW), drugi najveći kapacitet vjetra (14,2 GW), također i drugi najveći hidroenergetski (102,1 GW) te solarni kapacitet (67 GW).

Američko ministarstvo energetike prognozira kako će obnovljiva energija do 2050. godine imati potencijal proizvesti 80% električne energije u SAD-u, u odnosu na gotovo 20% danas. Isto tako, SAD se svrstava među najatraktivnijim zemljama za investicije u obnovljive izvore. U 2020. godini, u proizvodnji električne energije, obnovljivi izvori su generirali rekordnih 834 milijarde kWh električne energije, što je oko 21%, čime su obnovljivi izvori postali drugi najčešći izvor električne energije u SAD-u, nakon prirodnog plina (41%). Obnovljivi izvori su prvi put nadmašili i nuklearnu energiju (20%) i ugljen (19%), koji je nekoć bio najveći izvor u SAD-u. Ovaj rezultat u 2020. godini je uglavnom posljedica manje uporabe ugljena u proizvodnji električne energije i konstantno povećane upotrebe vjetra i sunca. Vjetar je trenutno u SAD-u najraširenji izvor obnovljive električne energije, koji se povećao za 14% u odnosu na 2019. godinu. Solarna proizvodnja

u komunalnim djelatnostima porasla je za 26%, a solarna energija malih razmjera (krovni solarni paneli) povećala se za 19%. EIA (2021) predviđa da će proizvodnja energije iz obnovljivih izvora nastaviti rasti u SAD-u i to za nekih 7% u 2021. i 10% u 2022. godini.

Prema navedenim podacima, može se zaključiti kako je SAD u posljednjih nekoliko godina vrlo uspješan u razvoju obnovljivih izvora energije i obnovljivih tehnologija. Naime, prema jednom istraživanju provedenom 2018. godine dokazano je da „zeleno gospodarstvo" u SAD-u potiče gospodarski rast i otvaranje novih radnih mjesta. Tako je u 2019. godini zeleno gospodarstvo generiralo čak 1,3 trilijuna USD prihoda od prodaje, što je nešto manje od 7% godišnjeg BDP-a, dok je stvorilo čak 9,5 milijuna radnih mjesta s punim radnim vremenom, što je oko 4% radno sposobnog stanovništva. Ovaj rastući dio gospodarstva postaje sve značajniji, s obzirom da SAD ima sve veći udio radno sposobnog stanovništva zaposlenog u zelenoj ekonomiji. Isto tako, u studiji se navodi da SAD ima veći prihod od prodaje po glavi stanovnika, koje stvara zeleno gospodarstvo, u odnosu na Kinu ili zemlje G20 ili zemlje OECD-a (Georgeson i Maslin, 2019).

Budući da je zelena ekonomija SAD-a u razdoblju od 2013. do 2016. godine porasla za 20%, očekuje se da će taj rast u sljedećem desetljeću biti još brži, s obzirom kako se borba protiv klimatskih promjena bude povećavala. Međutim, kako bi SAD nastavila biti konkurentna u toj industriji, važno je da nastavlja razvijati politike energije, okoliša i obrazovanja koje potiču rast u područjima obnovljive energije (Georgeson i Maslin, 2019). Uz zaposlenost i gospodarski rast, obnovljivi izvori energije pridonose i energetskoj neovisnosti, stabilnosti cijena na tržištu, dovode do smanjenih troškova energije, povećavaju vrijednost imovine, ali i smanjuju klimatske utjecaje.

Prema Springer i Daue (2020), na gospodarstvo SAD-a znatno utječu ulaganja u obnovljive izvore na javnim površinama. U 2019. godini bilo je 96 geotermalnih, komunalnih solarnih i vjetroelektranskih projekata koji su djelovali na javnim površinama s ukupnim proizvodnim kapacitetom od preko 5000 MW. Dostupni podaci pokazuju da su uplate zakupnine i autorskih honorara, iz razvoja obnovljivih izvora energije na javnim zemljištima, doprinijele saveznim, državnim i lokalnim samoupravama od 1982. godine preko 660 milijuna USD u 2019. godini. Nadalje, kapitalni troškovi za izgradnju projekata obnovljive energije koji posluju na javnim zemljištima doprinijeli su gospodarstvu više od 13 milijardi USD u 2019. godini počevši od 1996. godine. Procjene pokazuju da su ti projekti otvorili preko 12000 građevinskih radnih mjesta i više od 1700 poslova operacija i održavanja (Springer i Daue, 2020).

Kina je najmnogoljudnija zemlja na svijetu s brzo rastućim gospodarstvom zbog čega je postala najveći potrošač i proizvođač energije na svijetu. Kao jedna od najbrže rastućih gospodarstava na svijetu, Kina je postala utjecajnom na svjetskim energetskim tržištima, što joj je donijelo i brojne izazove po pitanju proizvodnje energije, osobito s rastom stanovništva i ekonomskim pritiskom na potražnju. Međutim, s ovim naglim povećanjem potrošnje energije zajedno s velikim oslanjanjem na ugljen, u Kini su se počeli pojavljivati različiti ekološki problemi, a jedan od najvećih je onečišćenje zraka. Unatoč strukturnim promjenama kineskog gospodarstva u posljednjih nekoliko godina, očekuje se da će kineska potražnja za energijom nastaviti rasti, stoga vladine politike nastoje podržavati niskougljičnu uporabu goriva, ulaganjem u tehnološki izazovnija uzvodna područja ugljikovodika (plin iz škriljevca, obnovljivi izvori), i mjere energetske učinkovitosti. U 2019. godini, ugljen je opskrbljivao većinu ukupne potrošnje energije u Kini, od 58%, s obzirom da je najdostupniji i najjeftiniji kineski resurs. Drugi najveći izvor goriva bili su nafta i druge tekućine, što je činilo 20% ukupne potrošnje električne energije u zemlji u 2019. godini (EIA, 2020).

Iako je Kina diverzificirala svoju opskrbu energijom i to tako da je u posljednjih nekoliko godina fosilna goriva zamijenila gorivima koja čišće sagorijevaju, poput hidroelektrične energije (8%), prirodnog plina (8%), nuklearne energije (2%) i ostalih obnovljivih izvora (5%), za male rastuće udjele potrošnje, i dalje su ugljen i nafta predvodnici u kineskoj potrošnji. Naime, kineska vlada je namjeravala ograničiti potrošnju ugljena na manje od 58% ukupne potrošnje primarne energije do 2020. godine (EIA, 2020). Cilj joj je smanjiti teško zagađenje zraka koje je u posljednjih nekoliko godina teško pogodilo određena područja zemlje. Kina je među najvećim svjetskim zagađivačima, u 2019. godini činila je gotovo 30% svjetskih emisija ugljika iz fosilnih goriva. Iz tog razloga, kineska vlada se pokušava riješiti pretjerane ovisnosti o fosilnim gorivima djelomično rebalansom gospodarstva od energetski intenzivnijih industrija i djelomično kombinacijom subvencija, ciljeva politike i poticaja za proizvodnju kako bi „očistila“ energetski sektor prelaskom na čišće izvore energije. Iako je udio u potrošnji obnovljive energije relativno malen, Kina je najveći proizvođač obnovljive energije na svijetu. Tako su do kraja 2020. godine kineski instalirani kapaciteti nove energije dosegli 930 milijuna KW, što čini 42,4% ukupnih instaliranih proizvodnih kapaciteta na svijetu. Hidroenergija, koja je najveći kineski obnovljivi izvor, je postigla 370 milijuna KW, slijede je snaga vjetra sa 280 milijuna KW i solarna fotonaponska (PV) energija sa 250 milijuna KW. U međuvremenu, količina energije proizvedene iz obnovljivih izvora energije u Kini je dosegla 2,2 bilijuna KW u 2020. godini, što čini 29,5% ukupne električne energije koju je cijelo društvo koristilo u prethodnoj godini. To je povećanje od 9,5 postotnih bodova u odnosu na 2012. godinu (Global Times, 2021). Osim obnovljivih izvora, u smanjenju uporabe štetnog ugljena, kineska vlada se orijentirala i na plin iz škriljevca. Dodavanjem velikih količina ukapljenog prirodnog plina (LNG) na svjetska tržišta, kineskim je obalnim područjima bilo jeftinije i lakše se prebaciti s ugljena na plin. U 2018. godini uvoz LNG-a u Kini je porastao za čak 50% (The Economist, 2018).

Budući da su kineski ciljevi dostići vrhunac emisije ugljika oko 2030. godine i postići ugljičnu neutralnost do 2060. godine, Kina aktivno povećava i promiče napredne tehnologije zelene energije kako bi pomogla u borbi protiv suzbijanja klimatskih promjena. Tako je Kina u 2020. godini bila vodeća zemlja u instaliranim kapacitetima obnovljive energije, od čak 895 GW. Do 2025. godine kineska vlada ima cilj povećati instalirani kapacitet nove energije na više od 50% ukupnih instaliranih kapaciteta za proizvodnju energije. Naime, to dovodi do brojnih ekoloških koristi, prvenstveno smanjenje utjecaja emisije stakleničkih plinova, ali i ekonomskih koristi. Dugoročno, obnovljiva energija može pružiti više mogućnosti zapošljavanja i promicati održivi gospodarski razvoj. Obnovljiva energija brzo se razvila tijekom posljednjeg desetljeća i osigurala je Kini, koja je uvijek bila na prvom mjestu u svijetu po čistoći energije, više od 4 milijuna radnih mjesta (Hong i Peng, 2020). Kina je tako najveći svjetski poslodavac u sektoru i čini 37 % ukupnih radnih mjesta u obnovljivoj energiji u svijetu.

Europska unija (EU), prema podacima iz 2019. godine, je proizvela oko 40% vlastite energije, dok je 60% energije bilo uvezeno iz trećih zemalja. Proizvodnja i uvoz zajedno čine raspoložive izvore energije u EU. Tako je u 2019. godini, energetski miks (tj. raspon dostupnih izvora energije) činilo nekoliko različitih izvora, a to su: nafta (36%), prirodni plin (22%), obnovljiva energija (15%), nuklearna energija (13%) i kruta fosilna goriva (13%). Udjeli različitih izvora energije u ukupnoj raspoloživoj energiji znatno se razlikuju među zemljama članicama. Primjerice nafta ima iznimno velik udio ukupne energije u Cipru, od čak 90%, Malta 87% i Luksemburg 65%, dok prirodni plin čini oko trećine udjela u Italiji, od 39% i Nizozemskoj, od 37%. Obnovljiva energija ima udio od otprilike 40% u Švedskoj i 37% u Latviji, nuklearna energija čini 41% u Francuskoj i 31% u Švedskoj te više od polovice dostupne energije u Estoniji i Poljskoj dolazi iz krutih fosilnih goriva.

EU je u posljednjih nekoliko godina također postigla značajan napredak u poboljšanju unutarnjeg tržišta električne energije i plina, pritom promičući primjenu obnovljivih izvora energije, smanjenu emisiju stakleničkih plinova, mjere energetske učinkovitosti i više cijene ugljika. U 2019. godini, EU je predložila Europski zeleni plan tj. skup od pedeset akcija za narednih pet godina u svim sektorima kako bi se gospodarstvo EU-a pripremilo na klimatsku neutralnost do 2050. godine. On ima potencijal za ubrzanje ulaganja i tehnološki napredak potreban za dugoročnu dekarbonizaciju (IEA, 2020).

U 2020. godini, obnovljivi izvori energije postali su najveći izvor električne energije u EU. Solarna energija i energija vjetra potaknuli su porast obnovljivih izvora energije u Europi, koji su proizveli petinu europske električne energije u 2020. godini. Vjetar je opskrbljivao 14% europske električne energije, u odnosu na 9% u 2015., a solarna energija opskrbljivala je 5%, u odnosu na 2015. godinu, od 3%. Proizvodnja vjetra i sunca je, isto tako, porasla za 10% (Enerdata, 2020). Mnoge zemlje zabilježili su značajan porast obnovljivih izvora u posljednjih godinu dana, što je bilo vrlo neočekivano s obzirom na Covid-19 pandemiju koja je dovela do velikog pada potražnje. Tako je Francuska, primjerice u proizvodnji solarne energije i energije vjetra prestigla fosilna goriva po prvi put, označavajući zelenu prekretnicu koje su Danska i Švedska već ispunile. Velik porast zabilježen je u mnogo zemalja EU, a najveći je ostvarila Njemačka, s 40%, Švedska, s 36% i Belgija, s 28% (Enerdata, 2020).

Prema projekcijama (European Commission, 2020), očekuje se rekordan rast u instalacijama proizvodnog kapaciteta vjetra i sunca u EU, osobito nakon pada troškova solarne energije i energije vjetra u 2020. godini. Takav porast ne samo da će utjecati na rješavanje klimatskih problema, već će imati znatan utjecaj na cjelokupno gospodarstvo EU. Otvaranje sve više čistih proizvodnih tehnologija dovest će do otvaranja radnih mjesta i postizanja gospodarskog rasta. Zaposlenost u obnovljivoj industriji raste globalno, ostvarivši tako gotovo 11 milijuna radnih mjesta u 2018. godini, od toga 1,5 milijuna u EU. Solarni fotonaponi, toplinske dizalice, bioenergija i hidroenergija čine oko 80% globalnih poslova vezanih za obnovljive izvore. Sektori koji imaju koristi od zelene tranzicije uključuju proizvodnju električne energije, uzgoj usjeva biomase, proizvodnju električnih strojeva, razvoj novih obnovljivih tehnologija, građevinarstvo, transport i dr. Očekuje se da će zaposlenost u širokom energetskom sektoru (uključujući sektore fosilnih goriva i obnovljivih izvora energije, kao i fleksibilnost energije i razvoj mreže) doseći 87 do 100 milijuna ukupnih radnih mjesta do 2050. godine, ovisno o ambicijama politike dekarbonizacije.

3. UČINCI ENERGETSKIH TRENDOVA NA ZEMLJE REGIJE MENA

MENA je kratica za Bliski istok (Middle East) i Sjevernu Afriku (North Africa). Ovaj pojam obično obuhvaća područje od Maroka na sjeverozapadu Afrike do Irana u jugozapadnoj Aziji te do Sudana na zapadu, iako ne postoji standardizirani popis zemalja za tu regiju. Tu spadaju Alžir, Bahrein, Džibuti, Egipat, Iran, Irak, Izrael, Jemen, Jordan, Kuvajt, Libanon, Libija, Maroko, Oman, Katar, Saudijska Arabija, Sirija, Somalija, Sudan, Tunis i Ujedinjeni Arapski Emirati. Neke od zemalja regije MENA su i zemlje članice OPEC-a zbog značajnih rezervi nafte, a to su Alžir, Iran, Irak, Kuvajt, Libija, Saudijska Arabija i Ujedinjeni Arapski Emirati (Chen, 2021).

Bliski istok i Sjeverna Afrika u svijetu su već dugo poznati kao područja bogata neobnovljivim izvorima energije, uključujući sirovu naftu i prirodni plin. Regija čini približno oko 6% svjetske populacije te sadrži čak 60% rezervi svjetske nafte te 45% rezervi prirodnog plina. Ona je važan

izvor globalnih energetskih resursa zbog značajnih izvora nafte i prirodnog plina, stoga je politička stabilnost u regiji važan element energetske sigurnosti. S obzirom da imaju više od polovice svjetskih rezerva nafte, većina ulaganja u regiji usredotočeno je na energetski sektor (Chen, 2021). Naime, kako se u posljednjih nekoliko godina mijenja ponuda energije i raste njezina ukupna potražnja, osobito za obnovljivim izvorima energije, te se povećavaju decentralizacija i fleksibilnost energetskih sustava, pitanje je hoće li se zemlje u MENA regiji moći prilagoditi novim trendovima i kolike posljedice će trpjeti. Svjetska odlučnost u borbi protiv klimatskih promjena zabrinjava svakog proizvođača nafte i plina, a još više velike izvoznike nafte u regiji MENA koji se nalaze na velikim dokazanim rezervama ugljikovodika, za koje se očekuje da će izdržati još pedesetak godina. Rizik da se takva imovina izgubi vrijednost je visok, sa strašnim posljedicama za ova slabo diverzificiana gospodarstva, stoga su promjene prijeko potrebne (Nakhle, 2020).

Potražnja za energijom u regiji MENA i dalje raste zbog porasta broja stanovnika, velike razine industrijalizacije i ostalih čimbenika. Očekuje se da će se potražnja za primarnom energijom povećavati po stopi od otprilike 1,9% godišnje do 2035. godine. Rastuća potražnja za energijom povezana je sa sve manjim zalihama fosilnih goriva i ugljikovodika unutar tog područja, a i cijelog svijeta. S obzirom da se ograničeni resursi fosilnih goriva smanjuju, zemlje žele ograničiti izvoz nafte i plina i preusmjeriti to na domaću potražnju jer je uvoz energenata iznimno skup. Iz tog razloga, pojedine zemlje MENA regije shvaćaju nužnost prelaska na obnovljive izvore energije. Pojedine zemlje iz MENA regije žele zaštiti okoliš od prekomjerne uporabe fosilnih goriva te na taj način smanjiti emisije stakleničkih plinova i ostala zagađenja. Taj veliki problem doveo je do toga da su pojedine zemlje MENA regije ubrzale svoj prijelaz na obnovljivu energiju kako bi se borile protiv zagađenja, a isto tako kako bi nastavile putem ekonomskog rasta i prosperiteta (Abdelrahim, 2019).

Međutim, postoji i druga strana, a to su zemlje kojima je glavni izvor prihoda nafta i koje nemaju dovoljno resursa za brz i učinkovit prijelaz na obnovljivu energiju. Uz nedostatak resursa, pojavljuju se i mnoge prepreke, poput slabe mrežne infrastrukture, regulatornih prepreka, pristupa financiranju i subvencija za konvencionalne izvore energije. U regiji MENA, većinom javni sektor dominira gospodarstvom, posebno što se tiče energetske infrastrukture, a sudjelovanje privatnog sektora ostaje skromno. Osim toga, u mnogim zemljama vlade jedva da imaju bilo kakav izvor prihoda neovisan o nafti i plinu. U Iraku, na primjer, ta ovisnost prelazi 90% posto. Sve dok državnim prihodima u regiji dominiraju ugljikovodici, prihodi od ugljikovodika morat će financirati novu, čistu energetsku infrastrukturu. Primjerice, u Bahreinu, Kataru, Kuvajtu i Omanu niska uporaba obnovljivih tehnologija može se pripisati nedostatku odgovornosti na institucionalnoj razini, nejasne podjele uloga, institucionalnoj inerciji te nepostojanju odgovarajućih politika i propisa. Mnoge zemlje su, za vrijeme pada cijena nafte 2014. godine, čak i usvojile ambiciozne planove energetske diverzifikacije, međutim, čim su se cijene oporavile i tržište stabiliziralo, planovi su bili odbačeni. Takve zemlje u regiji se još uvijek oslanjaju na naftu i na rastuću potražnju zemalja u razvoju, poput Kine, Indije i drugih azijskih zemalja koje su u procesu industrijalizacije. Izvoz u te zemlje nadoknađuje opadajuću stopu izvoza nafte u tradicionalne trgovinske partnere, kao što je to bio SAD, koji je sada manje ovisan o uvozu energije iz zemalja regije MENA. Unatoč tome, energetska diverzifikacija je neophodna i od velike važnosti u zemljama MENA regije, prvenstveno zbog klimatskih promjena, ali i zbog dugoročnije održivosti ugljikovodika te poboljšanja gospodarskog razvoja. Ako tijekom narednih desetljeća te zemlje ne budu diverzificirale svoje energetske sustave, mogle bi se susresti s velikim gospodarskim problemima poput pada potražnje, značajnih gubitaka prihoda, pada gospodarskog razvoja te političkih nestabilnosti (Berahab, 2020).

Danas je nekoliko zemalja u regiji među vodećim svjetskim proizvođačima obnovljivih izvora energije. Tako je primjerice u 2016. godini uloženo 11 milijardi USD u obnovljive izvore u cijeloj arapskoj regiji, za razliku od 2008. kada je uloženo samo 1,2 milijarde USD, što je devet puta više u samo osam godina. Predviđa se da će pad troškova obnovljivih tehnologija dovesti do još značajnih ulaganja u čistu energiju. Primjer zemlje koja ima značajne rezerve nafte i jedna je od glavnih emitera ugljika na svijetu, ali je i značajan proizvođač obnovljive energije, jesu Ujedinjeni Arapski Emirati (UAE) koji pak ulažu u proizvodnju solarne energije i u narednim desetljećima žele ostvariti udjel od 44% do 2050. godine, što je značajno povećanje u odnosu na razinu iz lipnja 2020. godine od (samo) 7%. Osim dva izgrađena solarna projekta, UAE razvijaju četiri nova projekta koja će ubrzati put do njegovih ciljeva u 2050. godini (Madden, 2020).

U travnju 2020. godine, Abu Dhabi je objavio najnižu tarifu za fotonaponski solarni projekt na svijetu. Također, imaju neke od najnižih cijena ugovora o kupovini električne energije u svijetu, a oba faktora dodatno doprinose potencijalu zemlje za rast obnovljivih izvora energije u narednim desetljećima (Madden, 2020). Uz UAE, značajna ulaganja u solarnu energiju ima Saudijska Arabija, međutim, solarna energija činila je samo 0,5% ukupne proizvodnje električne energije u zemlji 2020. godine, pri čemu nafta i plin dominiraju domaćim energetskim miksom. Ipak, to ne znači da solarna industrija Saudijske Arabije ne postoji, već samo da je spremnije ulagala u inozemne projekte nego na svojoj zemlji. U 2019. godini, u nacionalnom programu za obnovljivu energiju objavljeno je da Saudijska Arabija planira instalirati 27,3 GW pretežno solarne energije i u manjoj mjeri energije vjetra do 2023. godine te 58,7 GW do 2050. godine (Saiyid, 2021). Prema tome, uočava se kako regija prepoznaje društveno-ekonomske koristi od uvođenja obnovljivih izvora energije, što se doživljava kao prilika za industrijsku diverzifikaciju, nove aktivnosti u lancu vrijednosti i prijenos tehnologije.

Nadalje, većina zemalja regije MENA ima visoke ciljeve u ostvarivanju proizvodnih kapaciteta obnovljivih izvora energije u razdoblju od 2020. do 2050. godine. Saudijska Arabija ima cilj da proizvodnja obnovljivih izvora energije dosegne 30% svojih proizvodnih kapaciteta do 2030. godine, a Ujedinjeni Arapski Emirati 44% do 2050. godine. S druge strane, Džibuti ima cilj doseći 100% svojih kapaciteta za proizvodnju energije iz obnovljivih izvora do 2035. godine. Isto tako, veći proizvođači nafte u regiji, poput Katara i Kuvajta, imaju niže ciljeve u ostvarivanju kapaciteta za proizvodnju obnovljive energije od 10% i 20% do 2030. godine, za razliku od zemalja kojima nafta nije glavni izvor prihoda, poput Maroka i Tunisa koji do 2030. godine žele postići ciljeve od visokih 52% i 30%. Bez obzira na to, može se zaključiti da je obnovljiva energija svakako u porastu u regiji MENA i to osobito zbog mjera koje su zemlje poduzele u tom području kako bi ubrzale svoju energetsku tranziciju i tako se prilagodile svjetskom energetskom tržištu i unaprijedile svoj gospodarski razvoj.

4. UTJECAJ COVID-19 KRIZE NA ENERGETSKI SEKTOR I TRENDOVE

Pandemija Covid-19 donijela je velike neprilike u zemljama širom svijeta, pritom uzrokujući globalnu ekonomsku i društvenu krizu bez presedana. Ovaj izvanredni poremećaj imao je značajan utjecaj na sve aspekte života, pa tako i na energetski sektor. Energetski sektor je za vrijeme pandemije pretrpio iznimno smanjenje potražnje, financijski stres i poremećaje u lancu opskrbe električnom energijom. Isto tako, javile su se i zabrinjavajuće posljedice za prijelaze čiste energije, s obzirom da su se ulaganja ograničila, što je usporilo širenje ključnih tehnologija čiste energije. Neke ključne tehnologije, poput obnovljivih izvora, bile su gotovo otporne na učinke

krize, ali razvoj većine njih je značajno usporen, što je ujedno usporilo i energetsku tranziciju te sam put postizanja dugoročnih klimatskih i energetskih ciljeva (IFC, 2020).

Za vrijeme pandemije, procjenjuje se da se globalna potražnja za električnom energijom značajno smanjila, osobito u komercijalnom i industrijskom sektoru. Prema podacima British Petroleuma (BP), potrošnja primarne energije pala je za 4,5% u 2020. godini, što je najveći pad potrošnje od 1945. godine. Pad potrošnje bio je potaknut uglavnom naftom, koja je doprinijela gotovo tri četvrtine neto pada, iako su i ugljen i prirodni plin doživjeli iznimne padove. Međutim, solarna energija, energija vjetra i hidroelektrična energija su rasli unatoč padu ukupne potražnje za energijom (BP, 2021).

Prema podacima Enerdate (2021), globalni rast potrošnje energije pao je za otprilike 4% u 2020. godini, u kontekstu globalne pandemije, za razliku od prosječno 2% godišnje od 2000. do 2018. i usporavanja od 0,8% u 2019. godini. Potrošnja energije pala je u većini regija, posebice u razvijenim regijama, poput SAD-a (7,6%), EU-a (6,9%), Japana (7,4%) itd. Naime, smanjena gospodarska aktivnost i mjere *lockdown-a* imale su vrlo ozbiljan utjecaj na potrošnju energije u 2020. godini. Izuzetak je Kina, najveći potrošač energije, koja je u 2020. godini imala udjel u svjetskoj potrošnji energije od 24%. Naime, Kina se nakon samo nekoliko mjeseci oporavila od Covid-19 krize, iako se potrošnja povećala za samo 2,2%, što je znatno sporije u odnosu na prethodne godine. S druge strane, u 2021. godini situaciji se polako stabilizirala i potrošnja je ponovno počela rasti.

Smanjena gospodarska aktivnost (pad industrijske proizvodnje, smanjenja proizvodnja energije, manje automobila na cesti) umanjila je emisije stakleničkih plinova u 2020. godini te je tako pridonijela ubrzanju procesa dekarbonizacije. Emisije ugljika pri korištenju energije su pale za 6,3% na najnižu razinu od 2011. godine, što je također bio najveći pad od kraja Drugog svjetskog rata (IFC, 2020). Pad emisije ugljika uzrokovan COVID-19 pandemijom doveo je emisije bliže putu od 2°C za postizanje ciljeva Pariškog sporazuma, ali postoji velika vjerojatnost da se veći dio tog pada smanji kao prolazan. Ta smanjenja nisu rezultat usvajanja novih politika i strategija od strane vlada i tvrtki, već su neposredni rezultat egzogenog šoka, koji ima ozbiljne posljedice po zdravlje i gospodarsku aktivnost pojedinaca.

Dok su fosilna goriva bilježile rekordno niske cijene i pad potražnje, obnovljivi izvori su, s druge strane, bilježili neočekivani porast, zahvaljujući novim solarnim projektima i projektima vjetra. Obnovljiva energija, ne uključujući hidro energiju, u 2020. godini porasla je za 9,7% sporije od desetogodišnjeg prosjeka od 13,4% godišnje. Električna energija dobivena iz solarnih elektrana porasla je za rekordnih 1,3 EJ (20%), međutim vjetar je imao najveći porast od 1,5 EJ, u odnosu na druge obnovljive izvore. Isto tako, solarni kapacitet je povećan za 127 GW, dok je kapacitet vjetra narastao za 111 GW, što je gotovo dvostruko više od zadnjeg najvećeg povećanja. SAD je imao 0,4 EJ doprinosa u rastu obnovljivih izvora, Europa, od kojih se najviše ističu Francuska i Španjolska, 0,7 EJ, a najveći doprinos od 1,0 EJ imala je Kina. Ovakav porast obnovljivih izvora energije u ovakvim situacijama daju snažan optimizam za povećanu potražnju i ulaganja u obnovljive izvore energije u budućnosti. Naime, kako bi se to nastavilo, potrebno je vodstvo vlada, kompanija i drugih donositelja odluka koji će kroz politiku mjera ulaganja i inovacija svijet voditi kroz održiv dugoročni put.

5. ZAKLJUČAK

Energetski sektor jedan je od najznačajnijih sektora u svakoj ekonomiji. Energija pokreće ekonomiju odnosno pokreće industriju, transport, prometnu infrastrukturu i sve ostale društvene službe. S druge strane, ekonomija omogućuje uspostavu potrebne energetske strukture - od vađenja potrebnih resursa i materijala do tehnologija za proizvodnju energenata i opreme za krajnju uporabu te za pružanje željenih energetskih usluga. Također, ona financira energetske sustave i energetske tokove kako bi oni nesmetano funkcionirali te na taj način povećali društveni razvoj i blagostanje (Yeager i suradnici, 2014, str. 389).

Energetski trendovi, za koje se očekuje da će promijeniti budućnost energetskog sektora, su obnovljivi izvori energije, plin iz škriljevca, proces dekarbonizacije, decentralizacija i digitalizacija, fleksibilnost energetskih sustava i blockchain tehnologije. Ovi trendovi omogućuju bržu i jednostavniju energetsku transformaciju, smanjuju negativne utjecaje klimatskih promjena, pojačavaju energetsku sigurnost i daju širi pristup energiji. To sve utječe na razvoj energetskog sektora, a veliki pomaci u sektoru dovode do dugoročnog gospodarskog razvoja na globalnoj razini.

Kroz primjere svjetskih velesila, odnosno SAD-a, Kine, Europske unije i regije MENA, odnosno regije s najvećim svjetskim zalihama fosilnih goriva, prikazan je utjecaj trendova, prvenstveno obnovljivih izvora, na ekonomije tih zemalja. Prema navedenim podacima, zaključeno je kako trendovi donose brojne ekološke pogodnosti, od kojih je ključno rješavanja najvećeg problema, a to je smanjenje emisija stakleničkih plinova. Osim toga, trendovi donose i brojne ekonomske koristi brojnim gospodarstvima, poput povećanja zaposlenosti, gospodarskog rasta, stabilnijih troškova energije, većih prihoda imovine, energetske neovisnosti i još mnogo toga. No, 2020. godine pojavila se Covid-19 pandemija koja je donijela velike ekonomske i društvene neprilike, što je uvelike usporilo gospodarsku aktivnost svijeta u svim sektorima, pa tako i u energetskom. Energetski sektor je za vrijeme pandemije pretrpio iznimno smanjenje potražnje, što je usporilo i važnu energetsku tranziciju te sam put postizanja dugoročnih klimatskih i energetskih ciljeva. Iz tog razloga, važno je vodstvo zemalja koje će kroz politike mjera ulaganja i inovacija potaknuti još intenzivnije djelovanje energetskih trendova, koji će dovesti do još većih pogodnosti i na taj način voditi svijet kroz dugoročan održiv put.

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Razvoj konceptualnega modela trženja zdravil za redke bolezni

Development of a Conceptual Marketing Model for Medicinal Products for Rare Diseases

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Constructivist grounded theory

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Povzetek: *Zdravje je osnovna človeška vrednota in mu ne moremo in ne smemo postavljati cene, lahko pa poskušamo razumeti njegovo vrednost skozi prizmo morale, etike, znanosti in medčloveških povezav. Zdravja ne moremo vrednotiti skozi prizmo moralnih načel (ali je človek dober ali slab, je vreden pomoči, je njegov prispevek v družbi dovolj velik, da družba zanj poskrbi…). Posamezniki se z neozdravljivimi boleznimi spopadajo že ob rojstvu in celo življenje preživijo v iskanju tistega delčka pomoči ali rešitev, ki bi jim olajšala trpljenje in bolečine ter omogočila človeka dostojno življenje.*

Namen članka je predstaviti zasnovo za razvoj konceptualnega modela, ki bo osnova za kasnejše empirično testiranje in razvoj trženjskega modela vstopa zdravila sirote na trg, izdelanega na podlagi uveljavljenih trženjskih pristopov in spoznanj, pridobljenih v kvalitativni raziskavi s konstruktivističnim pristopom, ter zasnovana trženjska strategija, ki bo sledila zakonodajnim in etičnim načelom, ki jih zahteva trženje zdravil.

Abstract: *Health is a basic human value and we cannot and should not set a price on it, but we can try to understand its value through the prism of morality, ethics, science and human connections. Health cannot be evaluated through the prism of moral principles (is a person good or bad, is he worth helping, is his contribution to society big enough for society to take care of him...). . Some individuals struggle with incurable diseases from birth and spend their entire lives searching for that piece of help or solution that would alleviate their suffering and pain and enable them to live a dignified life.*

The purpose of the article is to present the design for the development of a conceptual model, which will be the basis for subsequent empirical testing and the development of a marketing model for the entry of an orphan drug into the market, developed with the implementation of established marketing approaches and insights gained in qualitative research with a constructivist approach, and a designed marketing strategy that will follow the legislative and ethical principles required for the marketing of medicinal products.

1. UVOD

Zdravje je osnovna človeška vrednota in mu ne moremo in ne smemo postavljati cene, lahko pa poskušamo razumeti njegovo vrednost skozi prizmo morale, etike, znanosti in medčloveških povezav. Kako pomembno je, lahko razberemo iz vsakodnevne medčloveške komunikacije, kjer besedo zdravje v različnih kontekstih in kombinacijah velikokrat uporabljamo; kot na primer na zdravje, pozdravljeni, zdravo in še več. Watt (2015, str. 207) trdi, da je življenje neločljivo povezano z zdravjem, saj brez določenega nivoja zdrave funkcionalnosti, življenje sploh ne more obstajati. Zdravja ne moremo vrednotiti skozi prizmo moralnih načel (ali je človek dober ali slab, je vreden pomoči, je njegov prispevek v družbi dovolj velik, da družba zanj poskrbi…); lahko rečemo celo nasprotno, posameznik, ki zaradi svojega zdravstvenega stanja ne more živeti polnovrednega življenja, nemalokrat potrebuje s strani družbe še več pomoči in podpore. Posamezniki se z neozdravljivimi boleznimi spopadajo že ob rojstvu in celo življenje preživijo v iskanju tistega delčka pomoči ali rešitev, ki bi jim olajšala trpljenje in bolečine ter omogočila človeka dostojno življenje.

[1] DOBA Business School Maribor, Slovenia
[2] DOBA Business School Maribor, Slovenia

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Evropska komisija (2019) v svojem letnem poročilu navaja, da se izdatki za zdravstvo dvigujejo zaradi naraščajoče prevalence kroničnih bolezni, starajoče populacije in visokih stroškov, ki so povezani z znanstvenim in tehnološkim napredkom v medicini. Zdravstveni sistemi v Evropi se dandanes srečujejo s kompleksnimi izzivi, kako zagotoviti dostopno, pravično in kakovostno zdravstveno oskrbo in hkrati ohraniti stabilnost javnih financ, ki so za to potrebne. Večina zdravstvenih sistemov v Evropi temelji na vzajemnosti, kjer je vsaj na osnovnem nivoju poskrbljeno za ranljive skupine, kot so otroci, nosečnice, invalidi in starostniki. Omenjenim skupinam so se v zadnjih desetletji pridružili še bolniki z redkimi boleznimi.

Etična vprašanja, ki se porajajo pri sodelovanju medicinske stroke in farmacevtske industrije, v splošnem obravnavamo z vidika medicinske strokovnosti, s poudarkom na navzkrižju interesov kot ključnem etičnem vprašanju. Navzkrižje interesov je pomembno stičišče etičnih pomislekov, ki lahko vodi do izkrivljanja klinične presoje posameznega zdravnika in objavljenih znanstvenih dognanj (Spurling idr. 2010 str. 36). Čeprav je vedno potrebno preveriti obstoj navzkrižja interesov, moramo paziti, da vidimo tudi druga etična vprašanja oz. da smo sposobni/pripravljeni videti širšo perspektivo. Lahko rečemo, da so ključne teme v povezavi z medicinsko etiko: zagotavljanje koristi za bolnike, izogibanje škodi in spoštovanje bolnikove izbire (Beauchamp in Childress 2008; Lo 2009).

V Sloveniji so zdravila večinoma financirana iz javnih sredstev, s strani zdravstvene zavarovalnice, Zavoda za zdravstveno zavarovanje Slovenije (ZZZS), katerega delovanje nadzoruje Ministrstvo za zdravje, vlada pa imenuje svoje predstavnike v organe upravljanja. Imetnik dovoljenja za promet z zdravilom[3] oz. predlagatelj, ki deluje v njegovem imenu, pripravi vlogo za razvrstitev zdravila na eno od list ZZZS. Komisija za zdravila pri ZZZS vlogo pregleda in ovrednoti. V primeru pozitivnega mnenja glede učinkovitosti in varnosti zdravila, klinični potrebi po zdravilu, pomenu za javno zdravje, ocene farmakoekonomskih podatkov in etičnem vidiku, ZZZS s predlagateljem dogovori ceno, ki jo je za zdravilo pripravljena plačati in uvrsti zdravilo med financirana iz javnih sredstev. Trženjsko-ekonomska perspektiva zdravil sirot je tesno povezana z etično perspektivo. Medtem, ko prva daje vpogled v to, zakaj je redkost pomembna pri določanju zdravstvenih prednostnih nalog, druga daje pomemben prispevek k razpravi o tem, ali bi morala biti redkost pomembna pri določanju zdravstvenih prioritet.

2. TRŽENJE ZDRAVIL

Ključna sestavina trženja so kreativne trženjske strategije in dodelani trženjski načrti. Pri oblikovanju trženjskih strategij si pomagamo s trženjskimi modeli. Glavni namen modela trženjske strategije je razviti orodja in vpoglede za oblikovanje trženjskih strategij. V trženjski literaturi obstajajo številni modeli trženjskega/strateškega načrtovanja, ki jih lahko uporabimo pri odločanju o trženju in pri oblikovanju trženja. V farmacevtski industriji, kjer se srečujemo z večjim številom dejavnikov, ki vplivajo na uspešnost trženja, vse bolj prihaja v ospredje model 11P: izdelek, patent, cena, promocija, trg, plačniki, oskrbovanci, zdravniki, farmacevti, farmacevtska industrija, bolniki (angl.: product, patent, price, promotion, place, payers, providers, physicians, pharmacists, pharmaceutical industry, patients), ki je v primerjavi z modelom 4P bistveno bolj kompleksen (Kesič 2004, str. 9). Kljub temu, da farmacevtska industrija proizvaja zdravila, ki so namenjena zdravljenju različnih bolezni in ki v določenih primerih rešujejo življenja, potrebuje tudi trženje. »Trženje se ukvarja s prepoznavanjem in izpolnjevanjem človeških in družbenih potreb« (Kotler in Keller 2016, str 27). Trženje je pomembna strateška funkcija

[3] Poslovni subjekt, ki je odgovoren za dajanje zdravila na trg in mora dokazati, da izpolnjuje vse zakonske zahteve.

farmacevtskih podjetij (Anamul 2011). Iz objavljenih podatkov vidimo, da farmacevtska podjetja več sredstev porabijo za trženje kot za razvoj (Anderson 2014).

Zakon o zdravilih in podzakonski akti med drugim urejajo tudi področje trženja zdravil. Kljub temu, da se termin trženje zdravil vsesplošno uporablja, ob strogem upoštevanju zakonodaje ne smemo oziroma ne moremo govoriti o trženju z vsemi elementi, ki jih ta pojem obsega, temveč zgolj o informiranju o zdravilu. V XIV. poglavju Zakona o zdravilih ter Pravilniku o oglaševanju zdravil je jasno zapisano, na kakšen način ter katere so tiste informacije, ki jih lahko posredujemo (zgolj in samo) strokovni javnosti, kadar govorimo o zdravilih na recept. Informacije morajo biti podane jasno, nedvoumno in skladno s povzetkom glavnih značilnosti zdravila in izvedenimi kliničnimi študijami.

V farmacevtski industriji je trženjska kombinacija vedno zasnovana tako, da vpliva na zdravnikovo odločanje in vodi v plodne/donosne izmenjave. Pri trženju zdravil gre za zapletene in etično občutljive povezave med kupci (zdravniki) in proizvajalci farmacevtskih izdelkov (farmacevtskimi družbami), zato je trženjska strategija močno in hkrati odgovorno orodje, ki poleg izboljšanja zdravnikovega in posredno bolnikovega zadovoljstva/dobrega počutja pripomore k razvoju in prenosu znanja in izkušenj. Trženje zdravil je pod drobnogledom splošne javnosti, strokovne javnosti in, ne nazadnje, konkurenčnih podjetij. Glede na izkušnje, med splošno razširjene trženjske prakse farmacevtske industrije sodi tudi izkrivljanje znanstvenih podlag, ki so osnova za dobro klinično prakso (Brody 2007; Lo in Field 2009). Nemalokrat prihaja do prikrivanja in napačne interpretacije znanstvenih dokazov, kar vodi k sistematičnemu precenjevanju učinkovitosti in varnosti novih zdravil (Abramson 2004; Angeli 2004; Deyo in Patrick 2005; Smith 2005; Avron 2004). Nepoštene trženjske prakse v farmaciji lahko pomenijo resno grožnjo javnemu zdravju, zato sta močna regulacija in nenehen nadzor nad trženjskimi sporočili nujna.

3. REDKE BOLEZNI IN ZDRAVILA SIROTE

V Evropski Uniji (EU) je redka bolezen definirana kot bolezen, ki prizadene manj kot 5 ljudi od 10.000. Večina bolnikov trpi za še redkejšimi boleznimi, ki prizadenejo 1 osebo na 100.000 ali več. Približno 5.000-8.000 različnih redkih bolezni prizadene 6-8% prebivalstva EU, kar pomeni med 27 in 36 milijonov ljudi (Evropska komisija, 2019). EU si je kot strateški cilj v povezavi z redkimi boleznimi zadala izboljšati dostop bolnikov do diagnoze, informacij in oskrbe. S svojim delovanjem podpira združevanje vseh deležnikov ter bolnikom in strokovnjakom omogoča izmenjavo strokovnega znanja in informacij. Specifični cilji teh prizadevanj so naslednji:

- izboljšati prepoznavanje in prepoznavnost redkih bolezni;
- zagotoviti ustrezno kodiranje in sledljivost redkih bolezni v zdravstvenih informacijskih sistemih;
- podpirati nacionalne programe za redke bolezni v državah EU;
- oblikovati evropske referenčne mreže, ki povezujejo strokovne centre in strokovnjake v različnih državah z namenom izmenjave znanja in iskanja različnih možnosti zdravljenja.

Orphanet (2020) definira zdravilo sirota kot zdravilo, ki ga farmacevtska industrija ne razvije zaradi ekonomskih razlogov temveč, da zadosti potrebam javnega zdravja. Zdravilo sirota je namenjeno diagnosticiranju, preprečevanju ali zdravljenju življenjsko ogrožajočih ali zelo resnih zdravstvenih stanj pri bolnikih z redkimi boleznimi. Farmacevtsko podjetje, ki razvija zdravilo za redko bolezen, lahko zaprosi Evropsko agencijo za zdravila (angl. European Medicines Agency, v nadaljevanju EMA) za dodelitev statusa zdravila sirote. Vsako zdravilo mora pred prihodom na trg pridobiti

dovoljenje za promet. Enako velja tudi za zdravila sirote, za katere EMA določa specifične zakonodajne okvire, ki se v določenih segmentih razlikujejo od zakonodaje za zdravila (EMA 2020).

Za učinkovito zdravljenje bolnikov z redkimi boleznimi je pomembno, da je zdravilo sirota na voljo v državi, v kateri živijo in da je cenovno dostopno. Drugi kriterij je velikokrat težko izpolniti, saj so stroški razvoja in registracije zdravila sirote visoki, ekonomska cena pa je posledično relativno visoka zaradi nizkega števila bolnikov, ki zdravilo potrebujejo. EMA dodeli status zdravila sirote, nudi pomoč pri izdelavi protokola registracijske študije in na koncu izda dovoljenje za promet z zdravilom. Ocenjevanje terapevtske vrednosti, oblikovanje cen in odločitev o financiranju iz javnih sredstev pa je enako kot pri vseh ostalih zdravilih, v pristojnosti posamezne države članice. To pomeni, da se farmacevtska podjetja v vsaki posamezni državi članici ločeno dogovarjajo o cenah. Podjetja pri tem uporabljajo različne strategije; včasih začnejo pogajanja z državami članicami, ki so bolj pripravljene sprejeti višjo ceno in jo nato uporabijo kot referenčno ceno v svojih pogajanjih z drugimi državami. V določenih primerih države članice zavlačujejo z dogovori o financiranju, da jim ni potrebno plačati visokih cen za zdravilo, pri čemer izgubljajo bolniki in posredno tudi farmacevtska podjetja, ki so v razvoj in registracijo zdravila sirote vložila sredstva (EURORDIS 2020).

4. VREDNOTENJE ZDRAVSTVENIH TEHNOLOGIJ (VZT), CENE IN FINANCIRANJE ZDRAVIL SIROT

Z izzivom financiranja iz javnih virov po ceni, ki je sprejemljiva za vse deležnike, se srečujemo tudi pri vstopu zdravila sirote na slovenski trg. Odločanje o javnem financiranju zdravila mora temeljiti na kliničnih, ekonomskih in socialnih merilih ob upoštevanju ustreznosti in (ne)gotovosti dokazov o varnosti, učinkovitosti in stroškovnih vidikih, ki so na voljo (Szegedi idr. 2018).

Vrednotenje zdravstvenih tehnologij (VZT) (angl. Health Technology Assessment – HTA) pridobiva na svojem pomenu kot del sistemskih pristopov, ki zagotavljajo dostopnost do zdravil. VZT je namenjena vrednotenju relativne učinkovitosti zdravil, medicinskih pripomočkov in drugih zdravstvenih tehnologij. Pri tem z uporabo znanstvenih pristopov ovrednotimo dodano vrednost določenega zdravila ali storitve v primerjavi s standardnim ali drugim primerjalnim pristopom k obravnavi istega zdravstvenega problema. Rezultati oziroma izidi VZT služijo kot osnova za nadaljnje ekonomske ocene ter podpirajo nadaljnje odločitve glede cen in financiranja izdelkov in storitev iz javnih sredstev (JAZMP 2021).

Cena zdravila v Sloveniji je regulirana z Zakonom o zdravilih ter Pravilnikom o določanju cen zdravil za uporabo v humani medicini. Po pridobitvi cene lahko imetnik dovoljenja za promet začne s postopkom za razvrstitve na liste zdravil pri ZZZS. Pri razvrščanju sodelujejo strokovnjaki z različnih področij. Pomembno vlogo ima tudi strokovna javnost, to so zdravniki, ki diagnosticirajo in vodijo/zdravijo bolnike z redko boleznijo in združenja bolnikov z redkimi boleznimi. Pobuda za razvrstitev zdravila sirote lahko podajo: imetnik dovoljenja za promet z zdravilom oziroma njegov predstavnik, strokovna javnost, bolniki. Včasih je pobuda za financiranje zdravila sirote iz javnih sredstev skupna.

Kljub različnim spodbudam s strani regulatorjev, pripravljenosti farmacevtskih družb, da se približajo pogojem in zahtevam, ki jih postavljajo/določajo plačniki, so cene zdravil za redke bolezni praviloma visoke, kar poleg naraščajočega števila zdravil za redke bolezni, predstavlja velik izziv za vzdržnost financiranja iz javnih sredstev v vseh državah.

Pri trženju zdravil sirot se srečujemo z nišnim področjem, ki zahteva prilagoditev že znanih modelov trženja. Po pregledu literature menimo, da model 11P, ki je sicer uporaben za trženje v farmacevtski industriji, ni ustrezen za področje zdravil sirot, saj nikjer ne upošteva vrednotenja zdravstvenih tehnologij (VZT), po drugi strani pa nekateri deležniki/elementi tega modela pri trženju zdravil sirot niso relevantni (na primer farmacevti, saj niso pomemben dejavnik pri odločitvi o dostopnosti zdravila). Vstop zdravila sirote na trg je kompleksen proces, zato je za vse deležnike pomembno celostno razumevanje problema, ki ga v formalni komunikaciji težko dosežemo.

Raziskava je osredotočena razvoj trženjskega modela vstopa zdravila sirote na trg, izdelanega na podlagi uveljavljenih trženjskih pristopov in spoznanj, pridobljenih v raziskavi s konstruktivističnim pristopom, ter zasnovana trženjska strategija, ki bo sledila zakonodajnim in etičnim načelom, ki jih zahteva trženje zdravil. Na podlagi analize zbranih informacij bomo v nadaljevanju predlagali prilagoditve razvitega trženjskega modela za slovenski trg. Poleg tega bomo raziskali, katera so, z vidika deležnikov, glavna VZT merila, ki jih mora izpolnjevati zdravilo sirota, da bo financirano iz javnih sredstev. Deležniki, ki neposredno ali posredno odločajo o dostopnosti, so: glavni mnenjski vodje v zdravstveni stroki, organizacije/združenja bolnikov z redkimi boleznimi, predstavniki ZZZS/Ministrstva za zdravje ter vodstvo oddelka za zdravila pri Zavodu za zdravstveno zavarovanje Slovenije in drugi. Z raziskavo želimo določiti dejavnike, ki se deležnikom zdijo bistveni pri odločitvi, ali bo zdravilo sirota uspešno vstopilo na slovenski trg, na podlagi tega razviti trženjski model vstopa zdravila sirote na trg ter predlagati trženjski načrt. Dodano vrednost med rezultati raziskave vidimo tako v optimizaciji in prilagoditvi postopka vstopa zdravil za redke bolezni na trg.

Po pregledu literature zaznavamo vrzel v znanju, znanstvenih objavah in razvoju ter praksah in interpretacijah trženja zdravil sirot ter ugotavljamo, da trenutno ne obstaja ustrezen trženjski model za slovenski trg (in tudi širše), ki bi bil prilagojen temu nišnemu področju. Zato bomo to vrzel zapolnili z izvirnim, induktivno oblikovanim modelom trženja zdravil sirot. Tematika, ki se jo v raziskavi lotevamo, je aktualna zaradi vse večjega števila zdravil sirot, ki vstopajo na trg, in je s trženjske perspektive slabo obdelana.

5. ZASNOVA KONCEPTUALNEGA MODELA ZA TRŽENJE ZDRAVIL ZA REDKE BOLEZNI

V 1. fazi raziskave, ki vključuje kritičen pregled razpoložljivih virov ter sintetiziranje ključnih ugotovitev bomo uporabili metodo analize dokumentov (angl.: documentary analysis method). Analiza dokumentov je način kvalitativne raziskave, pri kateri raziskovalec dokumente interpretira glede na raziskovano temo. Analiza dokumentov vključuje kodiranje vsebin v teme, podobne analizi prepisov fokusnih skupin ali intervjujev (Bowen 2009). Zbrane dokumente bomo razvrstili v skupine glede na vsebino ter za vsako skupino izvedli kodiranje vsebine skladno z našimi raziskovalnimi vprašanji. Pri tem bomo iskali ponavljajoče se vzorce, ki bodo nakazali smer raziskovanja in nam bodo v pomoč pri postavljanju vprašanj pri individualnih pol strukturiranih intervjujih ter fokusnih skupinah.

Za namen raziskave bomo s spletnimi orodji poiskali javno dostopne podatke, ki se nanašajo na redke bolezni, zdravila sirote ter zakonodajo in smernice, ki so povezane z njimi. To bodo: poročila Komisije za zdravila na ZZZS, poročila objavljena na spletni strani Orpha.net, Pravilnik o razvrščanju zdravil na listo (Uradni list RS, št. 35/13), objave in poročila povezana z zdravili sirote na spletni strani Evropske medicinske agencije, slovenske smernice za obravnavo

redkih bolezni, objavljene na nacionalni kontaktni točki/spletni strani Redke bolezni. Za dodaten vpogled na področje redkih bolezni in zdravil sirote bomo pregledali ustrezne baze podatkov, ki so na voljo na trgu (npr. IQVIA IMS podatki).

Drugi del raziskave, bo temeljil na kvalitativni raziskovalni paradigmi, z utemeljeno teorijo in konstruktivističnim pristopom. Kvalitativna metodologija predstavlja krovni pojem znotraj katerega so umeščene različne vrste raziskav, med njimi tudi utemeljena teorija, ki smo jo izbrali za izvedbo raziskave in jo utemeljujemo na konceptih, ki jih uporablja in razvija Kathy Charmaz (2000). Lahko bi rekli, da je jedro tega modela sprejemanje subjektivnosti in priznanje aktivnega vključevanja raziskovalca v tisto, kar se kaže kot konstrukcija in interpretacija podatkov skozi dialektične procese z udeleženci in s podatki (Charmaz 2014). Utemeljena teorija je vrsta raziskave, ki na podlagi množice kvalitativnih podatkov omogoča iskanje skupnega imenovalca vseh zbranih podatkov. Utemeljena teorija je že dolgo ena najbolj vplivnih in splošno sprejetih metod v kvalitativnih raziskavah (Murphy, Klotz, in Kreiner 2017; Timonen, Foley, & Conlon 2018). Prvotno sta jo zasnovala Glaser in Strauss (1967), kot alternativo takrat prevladujočim kvantitativnim raziskovalnim metodam in izvira iz sociooloških raziskav. Namen je bil omogočiti induktivno generiranje teorije s sistematičnimi metodološkimi strategijami analize zbranih podatkov (Birks in Mills 2015).

Konstruktivistični pristop se osredotoča na koncept interpretacije, torej predstavljanje dejstev in zaključkov o njih, ki so interpretacija tako anketirancev kot raziskovalcev. Charmaz (2014) je nadalje zapisala: »Namesto da bi razlagali resničnost, socialni konstrukcionisti vidijo več resničnosti in se zato sprašujejo: Kaj ljudje mislijo, da je resnično? Kako konstruirajo in ravnajo skladno s svojim pogledom na resničnost?«. Konstruktivistično utemeljeni teoretiki znotraj podatkov omogočajo več interpretacij in sprejemajo sposobnost posameznikov, da sami izberejo pomen, ki ga pripisujejo svojim izkušnjam. Raziskovalci, ki uporabljajo konstruktivistično utemeljeno teorijo, iščejo vzorce in teme v podatkih, da bi razumeli vpletene družbene procese. Pri raziskavah preučujejo izkušnje anketirancev, da bi lahko oblikovali skupne teme in teorije, ki najbolje odražajo naravo raziskovalnih problemov. Utemeljena teorija ostaja osredotočena na podatke in omogoča, da podatki usmerjajo dinamiko raziskave (Charmaz 2014).

Kot primarni vir podatkov za namen raziskave bomo izvedli polstrukturirane individualne in skupinske intervjuje, kot sekundarni vir nam bodo služili besedilni podatki. Pri raziskovanju z metodo konstruktivistične utemeljene teorije je intervju prostor raziskovanja, oblikovanja razumevanja, legitimiranja identitete in potrjevanja. Konstruktivistični utemeljeni teoretiki opazujejo celotno situacijo in razvoj intervjuja, konstrukcijo zgodbe in tišino udeleženca v raziskavi, odnos med raziskovalcem in udeležencem ter eksplicitno vsebino intervjuja. Konstruktivistični pristop gleda na intervju kot na pojavno interakcijo, v kateri se lahko razvijejo družbene vezi. Konstruktivistični in objektivistično utemeljeni teoretski pristopi pri intervjuju se glede snemanja in prepisovanja intervjujev razlikujejo (Charmaz 2014). Glaser (2001) trdi, da zapisovanje omogoča utemeljenemu teoretiku povzemanje bistva, ne da bi se izgubil podrobnostih, Charmazova (2014) pa meni, da zapiski ne ohranijo tona in tempa udeležencev, tišine in izjav ter oblike in poteka vprašanj in odgovorov, zato pri konstruktivističnem pristopu priporoča snemanje in prepis intervjuja (Charmaz 2014).

V raziskavo bomo vključili odločevalce, ki so odgovorni za oblikovanje cene zdravil, za razvrščanje zdravil na liste in za diagnosticiranje redkih bolezni in predpisovanje zdravil kot tudi zdravnike in bolnike. Z vsemi udeleženci, razen z bolniki, bomo izvedli polstrukturirane individualne intervjuje (8 intervjujev), z bolniki bomo izvedli fokusne skupine (12 udeležencev).

Na osnovi rezultatov raziskave bomo oblikovali konceptualni trženjski model za trženje zdravil sirot, ki za specifično področje znotraj trženja zdravil ne obstaja in ga empirično testirali, ter predlagali trženjsko strategijo, ki bo sledila zakonodajnim in etičnim načelom, ki jih zahteva trženje zdravil.

6. ZAKLJUČEK

Po pregledu literature zaznavamo vrzel v znanju, znanstvenih objavah in razvoju ter praksah in interpretacijah trženja zdravil sirot ugotavljamo, da trenutno ne obstaja ustrezen trženjski model za slovenski trg (in tudi širše), prilagojen temu nišnemu področju, ki bo optimiziral postopek vstopa zdravila sirote na trg. Tematika je aktualna zaradi vse večjega števila zdravil sirot, ki vstopajo na trg, in je s trženjske perspektive slabo obdelana.

Prispevek bo predstavljal kritično analizo, ovrednotenje in selekcijo literature ter njihovo nadgradnjo na podlagi lastnih ugotovitev in sinteze zaključkov s pomočjo le-teh. Raziskava v bo prvo raziskovalno delo, ki bo združevalo izkušnje in znanje strokovnjakov z različnih področij, ki se pri svojem delu srečujejo z redkimi boleznimi in zdravili sirotami v Sloveniji. Na podlagi zbranih podatkov in njihove analize, ki jo bomo izvedli po načelih konstruktivistične utemeljene teorije, bomo oblikovali prvi trženjski model, prilagojen izključno za trženje zdravil sirot. Poleg tega predstavlja pomemben prispevek tudi izviren metodološki pristop, saj utemeljena teorija ni značilna vrsta raziskave in razvoja modela na področju trženja. Uporaba raziskave bo pomembno prispevala k oblikovanju izhodišč za aplikacijo utemeljene teorije za raziskave v trženju.

Ugotovitve raziskave bodo drugim raziskovalcem lahko služile kot podlaga za nadaljnje raziskovanje na področju trženja zdravil sirot, saj predvidevamo, da se bodo marsikomu ob prebiranju napisanega odprla nova raziskovalna vprašanja, na primer s področja oblikovanja novih pristopov VZT, ozaveščanja strokovne javnosti in komuniciranja z bolniki.

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