

Varazdin Development and Entrepreneurship Agency and University North  
in cooperation with  
University Business Academy in Novi Sad  
Faculty of Economics and Engineering, Management in Novi Sad  
"Tamis" Institute  
Faculty of Management University of Warsaw  
Faculty of Law, Economics and Social Sciences Sale - Mohammed V University in Rabat  
ENCGT - Ecole Nationale de Commerce et de Gestion de Tanger - Abdelmalek Essaadi University  
Polytechnic of Medimurje in Cakovec



# Economic and Social Development

89<sup>th</sup> International Scientific Conference on Economic and Social Development –  
"Economical, Agricultural and Legal Frameworks of Sustainable Development"

## Book of Proceedings

Editors:

Nikola Curcic, Marko Caric, Svetlana Roljevic



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## THE IMPACT OF FISCAL POLICY ON THE CURRENT ACCOUNT BALANCE IN THE CASE OF BOSNIA AND HERZEGOVINA

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### ABSTRACT

*This paper aims to investigate and determine the relationship among the budget, changes in GDP, price indices and the movement of the real exchange rate on the one hand and the state of the current account balance in Bosnia and Herzegovina in the period 2005-2019. The paper covers literature that deals with the given field, empirical knowledge and case studies of various international researches, as well as certain econometric methods. The results of the research point to the existence of a negative link between the budget deficit, the reduction of prices and the real exchange rate, and the improvement of the current account balance. The results are different depending on whether it is a long-term or short-term horizon.*

**Keywords:** *budget, current account, price index, and real exchange rate*

### 1. INTRODUCTION

The balance of payments is an important indicator for measuring the state of an economy. However, without other indicators alone, the balance of payments does not say much, especially when it comes to various shocks in the economy. On the other hand, with different fiscal policy tools, governments can lead the economy in a certain desired direction. The question is whether these two quantities have a causal relationship with each other and how strong is this relationship? This issue has been particularly considered in the 1980s and 1990s, both in developed and developing countries Islam (1998), Magazzino (2012). The correlation of the given variables is especially interesting nowadays especially with the different economic problems that countries face. Economic theory provides two important determinants in terms of the relationship of given quantities. One is that changes in the current account balance and the fiscal balance are strongly interrelated (Keynesian theory) which is the basis of the Feldstein-Horioka hypothesis (1980). Another approach is the Ricardian equivalence hypothesis which emphasizes that there is no correlation between given quantities or that influence is negative. What is the impact of the budget deficit on the current account deficit in Bosnia and Herzegovina, taking into account other parameters such as inflation, changes in the real exchange rate and the trend of GDP growth is presented in this paper. Countries like B&H, which are still in transition, have some difficulties in fiscal governance due to both increased public debt and weak competitiveness in foreign trade. Fiscal policy has been implemented through the establishment of a single VAT rate since 2005 with a tendency to increase. However, there was also an increase in public debt as well as budget expenditures. In accordance with the methodology and research dedicated to the relationship between the current account balance and the fiscal account, an analysis of the interrelationship of these two indicators was made on the example of B&H for the period 2005 to 2019. GDP change had the largest oscillations in 2007 and 2008 as expected. Examining the given relations is especially important for Bosnia and Herzegovina as it has a highly decentralized fiscal policy where the general government in accordance with the Budget Law cannot have a budget surplus.

On the other hand, the entities that have the right to create public debt represent the bearers of budget deficits, while the current account deficit is shown at the country level. Indirect taxes such as those controlled by the state are unquestionably the main source of financing government spending at both the state and entity levels. Direct taxes in the last decade also have a growth trend, and follow GDP growth. Inflationary movements are moderate and do not show major oscillations.

## **2. HYPOTHESIS OF DOUBLE DEFICITS IN DIFFERENT EMPIRICAL STUDIES**

Research on the relationship between the budget deficit and the current account deficit has been conducted and published in numerous papers. All works can be divided into four groups. Thus, if we talk about the impact of the budget deficit on the current account balance, we can mention the following works (Abell 1990; Bachman 1992; Cash 1994; Islam, 1998; Piersanti 2000; Bluedorn, Leigh, 2011; Leachman, Francis 2002, Cavallo 2005, Erceg, Guerrieri, Gust 2005;). Another group of authors in their works confirms the impact of the current account deficit on the budget deficit, but not vice versa. This group of works includes (Anoruo, Ramchander 1998; Khalid, Guan 1999; Alkswani 2000; Kim, Kim, 2006; Marinheiro 2008). The third group are papers that indicate the non-existence or negative relationship between the budget deficit and the current account deficit (Enders and Lee 1990; Evans and Hasan 1994; Kaufmann, Scharler, Winckler 2002). The existence of a negative correlation between the fiscal deficit and the current account deficit on the example of the Baltic countries in the period 1999-2010 was established by Piotr (2012) in his paper. Finally, there is the fourth group that includes papers confirming the two-way relationship between the current account and the fiscal balance (Laney, 1984; Miller, Russek 1989, Boucher 1991, Evans 1993; Papaioannou, Yi 2001; Kaufmann, Scharler, Winckler 2002; Baharumshah, Lau 2007). It is particularly interesting to point out the work of Darrat (1988) in which it is proved beyond doubt that there is a double connection between the budget deficit and the current account deficit. These are quarterly data for the period 1960-1984. The paper confirms that there is a significant in the United States the impact of the budget deficit on the current account deficit and an even greater impact current account deficit to the level of budget deficit. It is interesting to mention the study by Khalid and Guan (1999) who analyzed the cause-and-effect relationship between the budget deficit and the current account deficit in five economically developed countries (USA, UK, France, Canada, Australia), and in five developing countries (India, Indonesia, Pakistan, Egypt, Mexico)) in the period 1950-1994, using the method of cointegration. The survey confirmed the existence of a causal link between the budget deficit and the current account deficit in four of the five developing countries. However, similar links have not been observed in developed countries. It is also important to mention a study done by Kumhof and Laxton (2009) which shows that a continuous increase in the budget deficit of 1% relative to GDP is not associated with an increase in the deficit in other countries. Consequently, this leads to a short-term deterioration in the current account balance of about 0.5 GDP and a long-term deterioration of the current account balance by 0.75 percent of GDP in large economies such as the United States and 1% percent in small open economies. Similar results are obtained by Lau, Baharumshah and Khalid (2006) who analyzed the relationship between the budget deficit and the current account deficit in four Asian countries (Indonesia, Malaysia, the Philippines and Thailand) between 1976 and 2000. they proved the existence of a long-term relationship between budget deficit and current account deficit. Thus, the paper confirms the existence of the twin deficit hypothesis in the case of Thailand, the inverse hypothesis of twin deficits in the case of Indonesia and the Feldstein-Horiok hypothesis in the other two countries. In his paper, Marinheiro (2006) investigated the relationship between the fiscal balance and the current account balance and found that there is an impact of the current account deficit on the fiscal deficit. In that sense, he used a series of data for the period from 1974 to 2002.



If we take into account most empirical studies, we can conclude that they confirm the presence of an interrelationship between the fiscal deficit and the current account deficit. Of course, there are papers that indicate the connection of other macroeconomic variables to the current account balance. Thus, in his work, Kovačević (2017) explores the relationship between the current account and its determinants on the example of nine countries in Southeast Europe, and emphasizes that the real effective appreciation of the exchange rate negatively affects the current account, while the net inflow of foreign direct investment has a positive impact. In addition to the above, the inflow of capital into the country is also of a great importance. That is, an increased inflow of foreign capital can mean (if it is only loans, not interest-free funds) and increased indebtedness, as well as an increased outflow in terms of interest and return on capital payments to foreigners. Increased capital inflows can cause increased demand, creating pressures that can eventually worsen the current account (Abbas et. All 2010).

### 3. METHODOLOGY

#### 3.1. National income, government spending and current account

In order to clarify the relationship between the fiscal deficit and the current account, it is useful to begin with some items of national income accounting. Economic theory analyzes the correlation of elements of national income and establishing the link between investment and savings, national income and public expenditures and public revenues. In this way, we express national income as a sum of consumption (C), investments (I) government expenditures (T), and differences between imports and exports (X-M):

$$Y = C + I + G + (X - M) \quad (1)$$

Income must arise either from domestic sales of consumer goods (C), investment goods (I), government goods (G), and net sales of goods to foreign entities (exports X minus imports M). We write the mentioned equation as:

$$Y - (C + I + G) = X - M \quad (2)$$

That is,

$$Y - (C + I + G) = CA \quad (3)$$

Or,

$$Y - A = CA, \quad (4)$$

Where:

CA- current account balance

And,

$$A = C + I + G - \text{total absorption} \quad (5)$$

If we have a closed economy, savings are equal to investments, since external variables do not exist (Hohberger and Herz, 2012; Krugman and Obstfeld, 1997). Therefore, investments can be written as:

$$I = Y - C - G, \quad (6)$$

If savings are equal to investments then we have:

$$S = J - C - G, \quad (7)$$

Then we get that in an open economy investments are not always equal to savings. This is because individuals, the government and other businesses can borrow funds from abroad. We can write savings as:

$$S = I + CA \quad (8)$$

Further, analyzing aggregate savings we see that it is made up of the private and public sectors. Therefore, we could write:

$$S = S_p + S_g \quad (9)$$

Private savings are considered to be a portion of disposable income that individuals have not spent. Therefore, we write private savings as the following equation:

$$S_p = Y_d - C = (Y - T) - C \quad (10)$$

Where:

$Y_d$ - disposable income,

$T$  - taxes.

Public savings, as opposed to private ones, are equal to the difference between taxes and government expenditures, which includes government purchases and transfers. In this sense, we write public savings as:

$$S_g = T - (G + R) = T - G - R. \quad (11)$$

where:

$G$ - Government (state) purchase,

$R$  - Government transfers.

In relation to expression (9), total private and public savings can be written as:

$$S = S_p + S_g = (Y - T - C) + (T - G - R) = I + CA \quad (12)$$

According to the above formula, the current account balance is written as:

$$CA = S - I = S_p - I + (T - G - R) = S_p - I - (G + R - T) \quad (13)$$

### 3.2. Model development

The expression (13) shows that if we have a constant difference between private savings and investment, then any change in fiscal policy is reflected in changes in the current account balance. This causal relationship indicates the emergence of twin deficits hypothesis. In other words, if we do not have a fixed difference between savings and investments, then changes in the fiscal balance must be offset by changes in savings. Namely, this situation is related to the fact that the increase in the budget deficit leads to an increase in private savings due to the fear

that the state will increase taxes in the future, in order to reduce the deficit. This further leads to a reduction in citizen spending and a current account deficit. (Mukhtar, Zakaria, Ahmed 2007). Thus, we see that the twin deficits hypothesis does not emerge in this situation. If we start from the assumption (traditional approach) that the country's economy is at the level of full employment, then an increase in the budget deficit causes a current account deficit, all due to an increase in aggregate demand (for domestic and foreign goods and services). This traditional approach emphasizes the strict link between the budget deficit and the size of savings and investments, the prices of production factors, the movement of the real exchange rate, the distribution of income, the value of foreign trade. Another explanation of the twin deficits hypothesis (Mundell-Fleming model 1962), emphasizes the quantitative approach. This model indicates that through fiscal expansion (the budget deficit arises as a consequence) which causes the current account deficit by increasing the interest rate, attracting foreign capital and at the same time appreciating the domestic currency. The second approach, in contrast, is based on the assumption that twin deficits are unrelated or negatively related (Makin 2002). This approach is called the Ricardian equivalence hypothesis which says that the budget deficit does not change interest rates and the exchange rate of the domestic currency and as such does not affect savings and consumption. As a consequence, the budget deficit has no impact on the current account balance. Therefore, according to the Ricardian equivalence hypothesis, these two balance sheets are not interrelated or have a negative correlation. The third approach starts from the assumption that there is an inverse causal relationship between the budget balance and the current account. That is, this approach explains that an increase in the current account deficit slows down the economy leading to a budget deficit (Enders and Lee 1990). The fourth approach starts from the assumption that the cause-and-effect relationship between the budget deficit and the current account deficit has a two-way relationship. In this sense, the Feldstein-Horioka hypothesis is used, according to which domestic savings and investments are highly linked in the long run, regardless of the large international mobility of capital. Therefore, according to expression (13), a high degree of connection between domestic savings and investments also means changes in the budget deficit and current account deficit. Thus, expression (13) can be written in the following form:

$$CA = Sp - I + FB \quad (14)$$

Where,

FB - balance of the state budget.

Economic theory offers several different econometric models by which analysts try to determine the relationship between the fiscal deficit and the current account deficit. This study seeks to show the relationship between a particular fiscal policy defined as the ratio of the budget balance to GDP and the current account balance as a share of GDP on the example of Bosnia and Herzegovina in the period 2005-2019. In addition to considering the causal relationship between these variables, this study also investigates the impact of other variables on current account value movements. In this sense, an economic model was used which can be represented by the expression:

$$CA = \alpha + \beta_1 FB + \beta_2 Z + \varepsilon, \quad (15)$$

Where:

Z - other explanatory variables Gross Domestic Product growth (g GDP), Real exchange rate (REER) and consumer price index (CPII).

$\beta_1$  and  $\beta_2$  coefficients of the regression equation,  $i$   
 $\varepsilon$  - the concept of error.

### 3.3. Data source and variable relationships

The time series of data used in this model is based on the quarterly frequency and covers the period from the first quarter of 2005 to the last quarter of 2019. The model is based on the stationarity of the analyzed time series. According to the time series of data, the research has the task of determining the stability of the positive relationship between the budget balance and the current account balance. Basically, the paper contributes to determining whether there is a causality of the mentioned quantities, which affects the possibility for the B&H model to predict the twin deficit hypothesis. In order to obtain a complete picture, it is necessary to take into account the variables that are related to the values of the current balance, especially emphasizing the changes in the real exchange rate. In that sense, descriptive statistics as well as correlation between variables were done, and finally a unit root test as well as a Granger Causality test were done, which is presented in the paper.

## 4. DATA ANALYSIS

### 4.1. Descriptive statistics

This paper seeks to investigate the relationship between fiscal policy and the balance of payments and to consistently determine whether there is a causal link between the fiscal deficit and the current account deficit. The current account balance was created on the basis of real GDP growth, inflation, tax revenues, the real exchange rate and government spending. The study first established descriptive statistics before assessing trends and models. Figure 1 shows that the trend of the fiscal balance is moderate with a slight fluctuation in 2009 and 2011, which was caused by the shock on the financial market, which affected the reduction of budget revenues. Larger oscillations in the current account balance were noticeable in 2005 and 2006 at the time of the introduction of VAT in the B&H fiscal system.

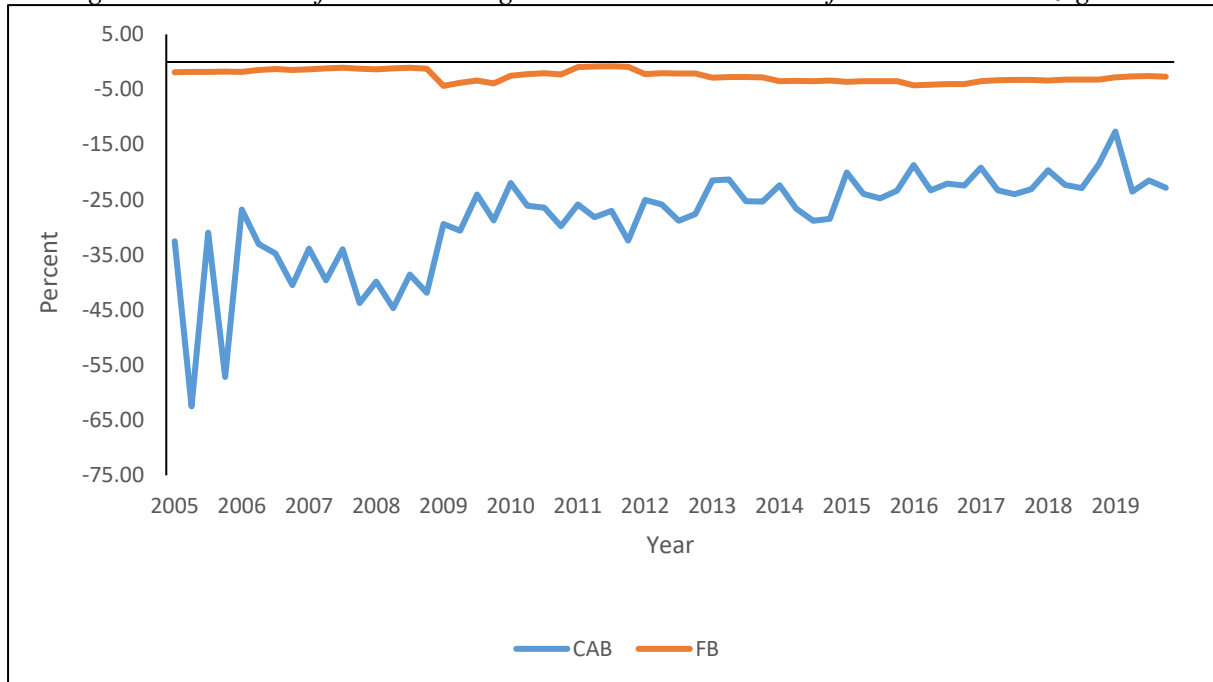
*Table 1: Descriptive statistics*

	<b>CAD</b>	<b>BD</b>	<b>GDP G</b>	<b>CPI</b>	<b>REER</b>
<b>Mean</b>	-28,398550	-2,515915	1,484637	5,214833	-1,203233
<b>Median</b>	-25,989840	-2,642722	0,700000	4,550000	-1,035000
<b>Maximum</b>	-12,620460	-0,772559	21,485100	16,800000	4,180000
<b>Minimum</b>	-62,500000	-4,334861	-15,321030	-0,700000	-7,470000
<b>Standard Deviation</b>	8,905900	1,031529	7,894407	47,416980	2,550214
<b>Skewness</b>	-1,667036	0,099386	0,188710	1,133876	-0,307194
<b>Kurtosis</b>	6,528468	1,768492	3,423657	3,609054	3,270539
<b>Jarque-Bera</b>	58,915300	3,885397	0,804829	13,784110	1,126659
<b>Probability</b>	0,000000	0,143317	0,668703	0,001016	0,569310

*Source: Own calculation*

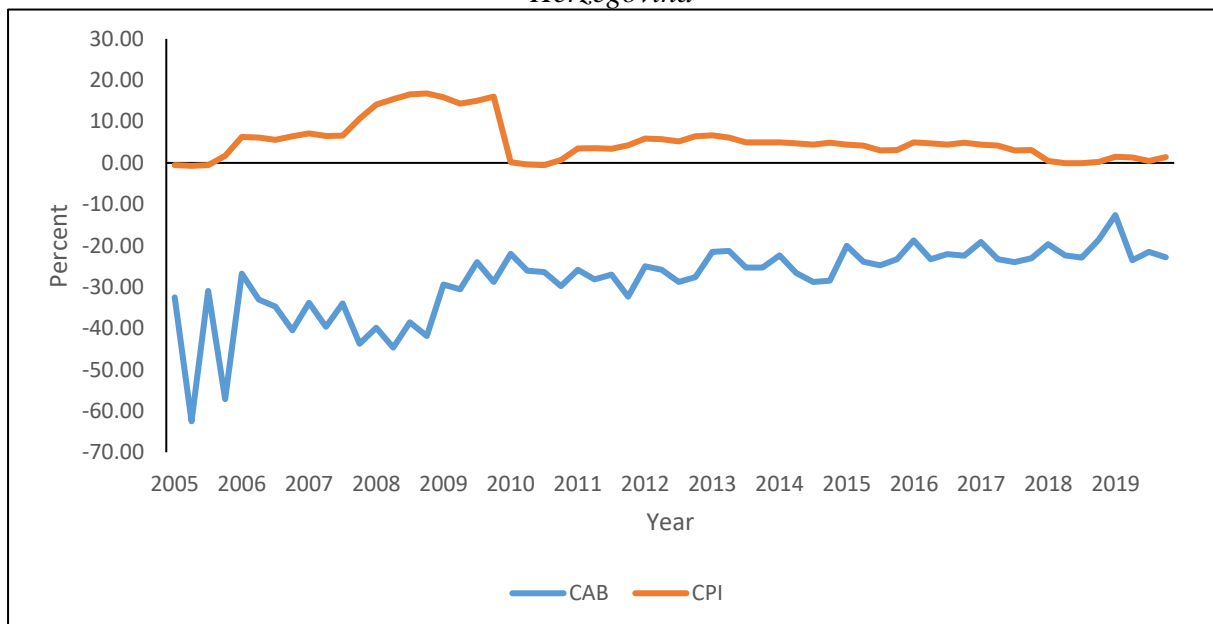
*Figure following on the next page*

*Figure 1: Balance of the state budget and current account of Bosnia and Herzegovina*



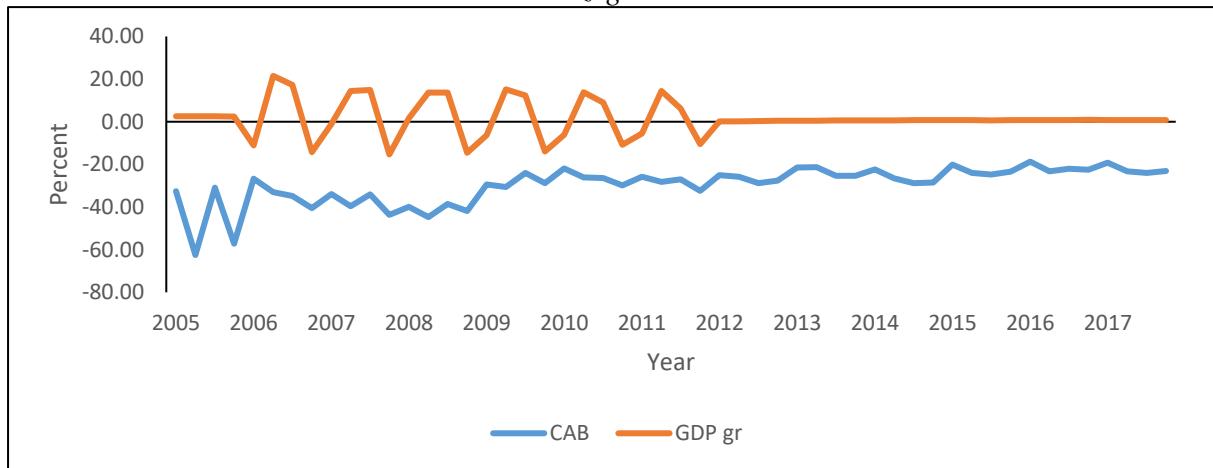
Changes in the current account balance in 2005 and 2006 are not accompanied by changes in the budget. After this period, changes in the current account balance are followed by changes in the fiscal balance. Only 2019 deviates from the given trend where it is evident that although there were no major changes in the budget, the current account balance experienced a sharp increase. Mean values recorded in the period 2005-2019, for the current account balance and the fiscal balance in relation to GDP are 28.39 and 2.51% respectively.

*Figure 2: Trend in current account balances and consumer price indices in Bosnia and Herzegovina*



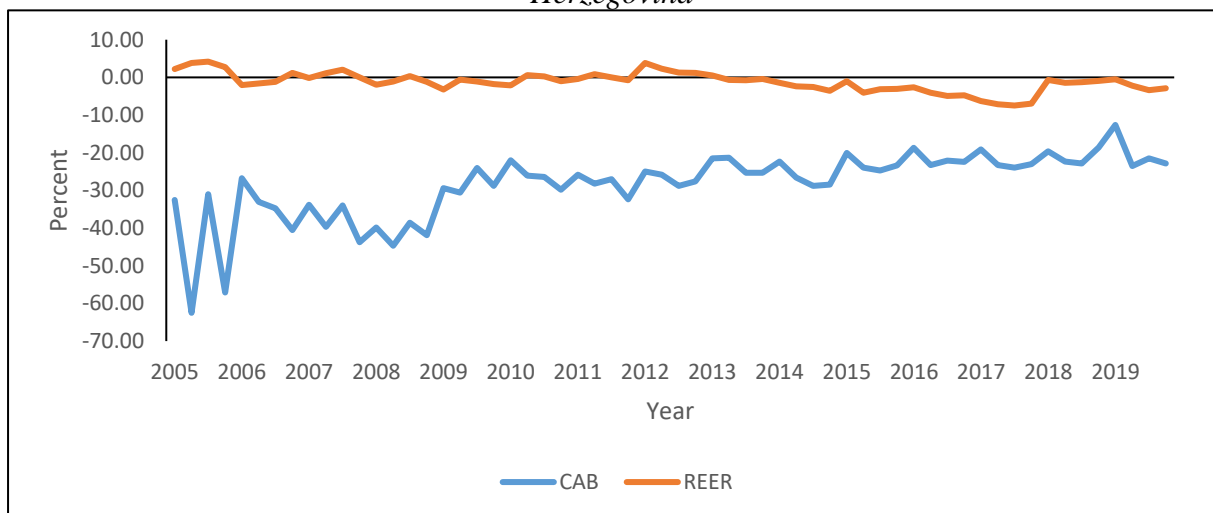
With the exception of 2010, the CCI has a fairly steady trend over a given period. The recorded mean value of the price index is 5.21.

*Figure 3: Trend in current account balances and gross domestic product in Bosnia and Herzegovina*



GDP growth, with some fluctuations from 2005 to 2011, has a steady and slight growth of 0.8% on a quarterly basis. Its mean value recorded for the observed period is 1.48.

*Figure 4: Trend in current account balances and real exchange rate in Bosnia and Herzegovina*



The movement of the real exchange rate of the domestic currency fluctuates around zero, and the largest decline was recorded in 2016 and 2017. Its average value for the observation period is -1.20. The correlation between the budget balance and the current account balance, as well as the correlation between the current account balance and other macroeconomic variables with which the given model was constructed are shown in Table 2.

#### 4.2. Correlation between the observed variables

Correlation coefficients, calculated on the basis of available data, between the current account balance on the one hand and the fiscal balance, and changes in the real exchange rate on the other, indicate the presence of real significant correlation while the price index and current account balance show a slight correlation. The established correlation records a negative relationship between the given variables. Gross domestic product growth has no significant impact, with the price index also showing a low value.

This further means that the improvement of the state budget balance as well as to some extent the real exchange rate in Bosnia and Herzegovina was accompanied by a deterioration of the current account balance in the analyzed period, which can be seen in the following table.

*Table 2: Correlation coefficients between Current Account Balance, Fiscal Balance, Consumer Price Index and Gross Domestic Product Growth in Bosnia and Herzegovina for the period 2005-2019.*

	<b>CAB</b>	<b>FB</b>
<b>CAB</b>	<b>1</b>	
<b>FB</b>	-0,57581	1
	<b>CAB</b>	<b>CPI</b>
<b>CAB</b>	<b>1</b>	
<b>CPI</b>	-0,289115	1
	<b>CAB</b>	<b>REER</b>
<b>CAB</b>	<b>1</b>	
<b>REER</b>	-0,463	1
	<b>CAB</b>	<b>G GDP</b>
<b>CAB</b>	<b>1</b>	
<b>GDP gr</b>	-0,05099	1

*Source: Own calculation*

Based on the analysis of the correlation between the given quantities, no conclusions can be made about the impact of one value on another. This analysis cannot provide answers to possible shocks in fiscal policy that would arise due to changes in the market of certain goods or services. If, for example, on the one hand the economic situation in the country improves (in terms of increasing national income) it could lead to a reduction of the budget deficit, however on the other hand it could lead to an increase in the current account deficit due to increased imports. Precisely, from the impossibility of obtaining accurate results that indicate the correlation of given quantities through correlation analysis, we can suggest that there is still a negative relationship between the budget balance and the current account balance.

#### 4.3. Unit root analysis

In order to perform a complete evaluation of the model, it is necessary to determine the stationarity of the analyzed time series. An extended Dickey-Fuller test (ADF) was used for this purpose. To use the test itself, the model in functional terms needs to be redesigned to obtain the stationarity of the variables used. This was done by substituting the values of the variables for their first differences. After the first differentiation, the extended Dickey-Fuller test for the sizes included in the model would look like this:

*Table 3: Unit root test — first differentiation*

<b>Variable name</b>	<b>ADF Test</b>	<b>1 % Level</b>	<b>5 % Level</b>	<b>10 % level</b>
<b>Current account balance</b>	-3,56941	-3,56002	-2,91765	-2,59669
<b>Fiscal balance</b>	-8,29612	-3,54821	-2,91263	-2,59403
<b>GDP growth rate</b>	-7,80589	-3,55747	-2,91657	-2,59612
<b>Consumer price indeks</b>	-6,86696	-3,54821	-2,91263	-2,59403
<b>Real exchange rate</b>	-8,58540	-3,54821	-2,91263	-2,59403

*Source: Program EvIEWS 11*

A graphical representation of the dependence of the current account balance on other variables is presented in the graphs given in the appendix.

#### 4.4. Granger Causality Test

In order to establish the direction of causality among the mentioned variables, a Granger Causality test will be conducted to help us understand the interactions between the fiscal balance and the current account balance and what the results are.

*Table 4: Granger Causality Test*

Pairwise Granger Causality Tests			
Sample: 2005-2019			
Null Hypothesis:	Obs	F-Statistic	Prob.
CPI does not Granger Cause CAB	57	0,69021	0,50600
CAB does not Granger Cause CPI		0,53252	0,59030
FB does not Granger Cause CAB	57	2,14868	0,12690
CAB does not Granger Cause FB		0,35721	0,70130
G_GDP does not Granger Cause CAB	57	2,85272	0,06680
CAB does not Granger Cause G_GDP		0,99571	0,37640
REER does not Granger Cause CAB	57	1,25301	0,29410
CAB does not Granger Cause REER		1,43147	0,24820
FB does not Granger Cause CPI	57	1,21879	0,30390
CPI does not Granger Cause FB		0,11294	0,89340
G_GDP does not Granger Cause CPI	57	1,31752	0,27660
CPI does not Granger Cause G_GDP		0,07305	0,92970
REER does not Granger Cause CPI	57	0,16903	0,84490
CPI does not Granger Cause REER		2,21851	0,11900
G_GDP does not Granger Cause FB	57	1,72534	0,18820
FB does not Granger Cause G_GDP		1,10316	0,33950
REER does not Granger Cause FB	57	1,02102	0,36730
FB does not Granger Cause REER		0,08479	0,91880
REER does not Granger Cause G_GDP	57	2,47901	0,09370
G_GDP does not Granger Cause REER		0,96397	0,38810

*Source: Program Eviews 11*

The study conducted a pair-wise Granger causality test in order to determine the interrelationship of the variables. The test results can be seen in Table 4. The null hypothesis at the 5% significance level was rejected in the event that Granger's fiscal balance sheet affects the current account balance. The same situation is in the case of the consumer price index Granger affects the fiscal balance. The results also further suggest that the real change in the Granger exchange rate also affects GDP growth when the zero hypothesis is rejected at the 10% significance level.

#### 4.5. Long-term causal relationship between variables

The analysis of the estimation of the structural parameters of the model is given in the following table. By performing the first differentiation of the variables to eliminate the nonstationary form, results describing the given relationship were obtained. The vector autoregressive model (VAR) used shows a long-term cause-and-effect relationship between certain variables. The results that indicate a long-term period are shown in Table 5. The long-run R-squared regression coefficient of 0.4278 implies that 42.7% of the current account balance variation can be



explained by independent variables of the budget account balance and price index in the long run. The model as a whole is significant, as shown by an F statistic of 10.2 (p value = 0.000002). the results indicate that the change in the budget balance has a negative and significant relationship to the current account balance (Beta = -3.7107, p value = 0.0012). This means that any reduction in the budget deficit by one unit improves the current account by 3.71 units. Regarding the consumer price index, we can also state that the ratio is negative and significant in relation to the current account balance. Namely, the reduction of prices for one unit simultaneously improves the current account balance by 0.498 units.

*Table 5: Results for the long term*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
<b>Intercept</b>	-36,166255	2,942914	12,289269	0,000000
<b>FB</b>	-3,710734	1,094281	-3,391024	0,001295
<b>GDP gr</b>	0,047557	0,116602	0,407855	0,684964
<b>CPI</b>	-0,498165	0,192959	-2,581713	0,012526
<b>REER</b>	-0,797067	0,440979	-1,807493	0,076155
<b>R Square</b>	0,427844			
<b>Adjusted R Square</b>	0,386233			
<b>Significance F</b>	0,000002			
<b>F</b>	10,281907			

*Source: Own calculation*

#### 4.6. Short-term relationship between variables

To correct the error in the model, the ratio will be calculated on a short-term basis. Namely, for the analysis of the relationship between the current account balance and the state budget as well as other determinants that were taken into account, a vector autoregressive model (VAR) was also used, which indicates a short-term cause-and-effect relationship between variables. From table 6 it can be seen that the regression coefficient shows that 50% of the variation of the current account balance can be explained by the price index and changes in the real exchange rate in the short run. Changes in the fiscal balance did not gain statistical significance as their p value was above 0.05. F statistics in the case of a short-term relationship have no significant value. Namely, only changes in prices and the real exchange rate lead to changes in the current account balance. Since the changes have a negative relationship, this means that a reduction in prices and the real exchange rate by one unit improves the current account deficit by 1.90744 and 1.4183 units, respectively.

*Table 6: Results for the long term*

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Intercept	9.241907	6.222943	-1.485134	0.165593
FB	5.497217	2.730846	2.013009	0.069242
GDP gr	-9.276552	6.036027	1.536864	0.152578
CPI	-1.907447	0.805457	2.368155	0.037273
REER	-1.418398	0.431929	3.283872	0.007284
R Square	0.506173			
Adjusted R Square	0.326600			
Significance F	0.078092			
F	2.818755			

*Source: Own calculation*

## 5. CONCLUSION

The results of the research on the relationship between the current account balance on the one hand and the fiscal balance, price index, GDP trends and changes in the real exchange rate on the other hand show different influences according to the time period of observation. In the long run, changes in the budget in terms of reducing the deficit affect the reduction of the current account balance. Price changes also have a significant impact on the decline in the current account deficit. In the short run, fiscal policy has a corresponding impact on changes in balance of payments. However, the change in prices and the real exchange rate in the short term leads to changes in the country's trade balance, as is the case with the long-term horizon. Thus, long-term changes in fiscal policy may affect the improvement of the current account balance. Price changes also have a noticeable intensity of action. Changes in the real exchange rate have a certain significance only if it is a question of currencies outside the euro area, since the KM is fixedly pegged to the Euro due to legal solutions. In that sense, the existing monetary policy in Bosnia and Herzegovina does not have the possibility to change the real exchange rate.

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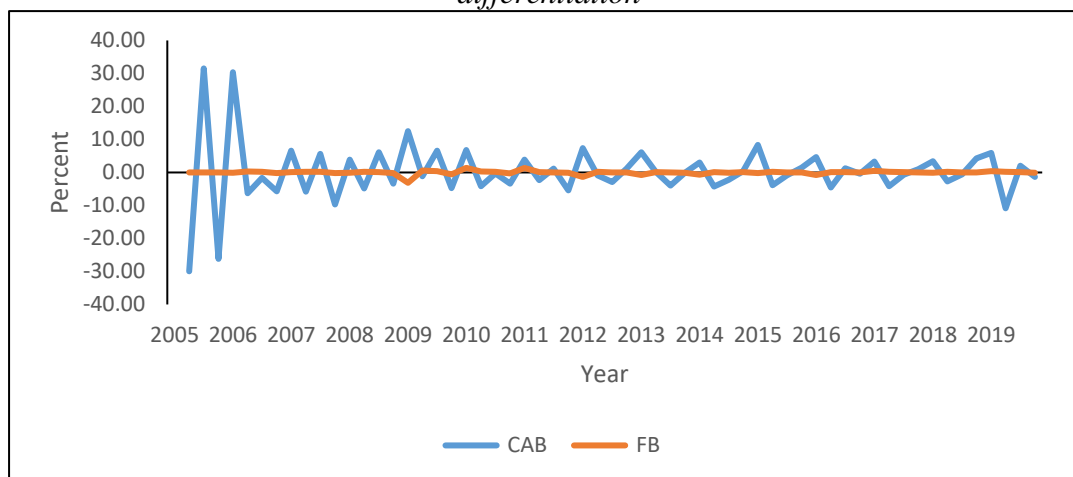
## APPENDIX

### *Basic data on a quarterly basis for the period 2005-2019*

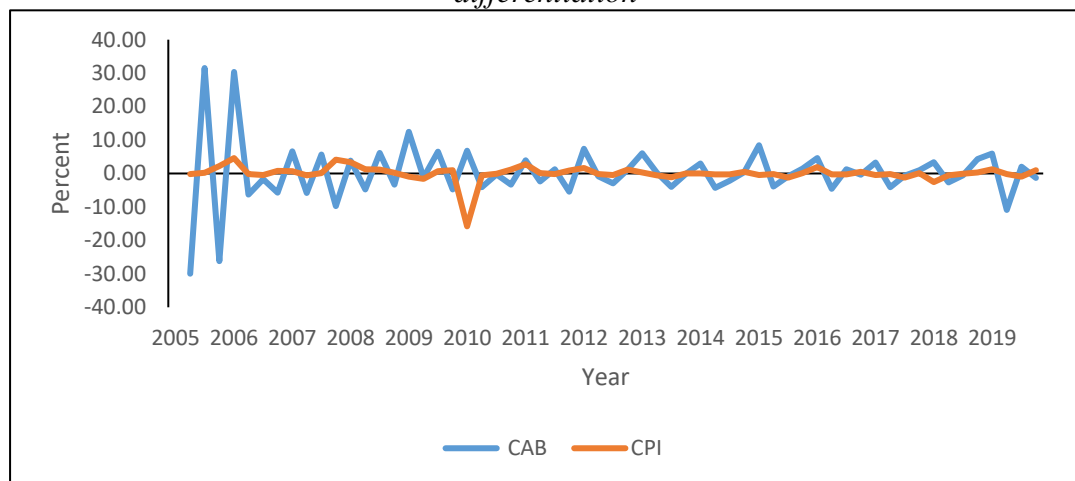
Period	CAB	FB	GDP gr	CPI	REER
2005	-32,55	-1,88	2,63	-0,50	2,2
	-62,50	-1,83	2,56	-0,70	3,82
	-30,98	-1,78	2,50	-0,50	4,18
	-57,14	-1,74	2,44	1,70	2,71
2006	-26,77	-1,79	-11,07	6,30	-2,04
	-33,06	-1,47	21,49	6,10	-1,62
	-34,74	-1,26	17,35	5,60	-1,16
	-40,49	-1,46	-14,19	6,40	1,19
2007	-33,86	-1,36	-1,09	7,10	-0,14
	-39,64	-1,19	14,42	6,50	1,11
	-33,99	-1,03	14,92	6,60	2,08
	-43,72	-1,22	-15,32	10,70	0,04
2008	-39,86	-1,32	1,70	14,10	-1,92
	-44,67	-1,16	13,73	15,40	-1,08
	-38,55	-1,02	13,66	16,60	0,34
	-41,89	-1,20	-14,47	16,80	-1,2
2009	-29,40	-4,33	-6,22	15,90	-3,2
	-30,60	-3,76	15,19	14,30	-0,57
	-24,03	-3,35	12,34	15,00	-1,14
	-28,76	-3,89	-13,92	16,00	-1,8
2010	-21,98	-2,50	-6,06	0,20	-2,13
	-26,11	-2,19	13,82	-0,40	0,56
	-26,41	-2,01	9,04	-0,50	0,26
	-29,79	-2,26	-10,85	0,70	-0,98
2011	-25,86	-0,94	-5,59	3,50	-0,44
	-28,19	-0,82	14,36	3,60	0,89
	-26,98	-0,77	6,17	3,40	0,006
	-32,39	-0,86	-10,55	4,30	-0,74
2012	-25,02	-2,20	0,10	5,90	3,8
	-25,87	-2,04	0,20	5,70	2,31
	-28,80	-2,07	0,30	5,20	1,28
	-27,60	-2,08	0,40	6,40	1,22
2013	-21,51	-2,83	0,50	6,70	0,55
	-21,32	-2,72	0,50	6,10	-0,67
	-25,29	-2,73	0,60	5,00	-0,8
	-25,35	-2,80	0,60	5,00	-0,43
2014	-22,36	-3,48	0,60	5,00	-1,44
	-26,61	-3,43	0,60	4,70	-2,34
	-28,81	-3,51	0,70	4,40	-2,57
	-28,45	-3,39	0,70	4,90	-3,54
2015	-20,06	-3,63	0,70	4,40	-0,99
	-23,94	-3,47	0,70	4,20	-4,08
	-24,76	-3,49	0,60	3,00	-3,18
	-23,33	-3,46	0,70	3,10	-3,06
2016	-18,71	-4,25	0,70	5,00	-2,66
	-23,28	-4,10	0,80	4,70	-4,09
	-22,05	-4,00	0,80	4,40	-4,9
	-22,45	-4,01	0,90	4,90	-4,72
2017	-19,15	-3,47	0,80	4,40	-6,3
	-23,29	-3,31	0,80	4,20	-7,1
	-23,97	-3,23	0,80	3,00	-7,47
	-23,04	-3,27	0,70	3,10	-6,93
2018	-19,66	-3,37	0,80	0,50	-0,68
	-22,33	-3,22	0,80	-0,06	-1,41
	-22,89	-3,17	0,80	-0,10	-1,26
	-18,58	-3,18	0,80	0,23	-0,97
2019	-12,62	-2,80	0,7	1,50	-0,49
	-23,53	-2,64	0,6	1,36	-2,22
	-21,49	-2,53	0,5	0,46	-3,39
	-22,83	-2,65	0,3	1,40	-2,89

*Source: Agency for Statistics of BiH, Ministry of Finance of RS and F BiH, Bulletin of the Central Bank of BiH*

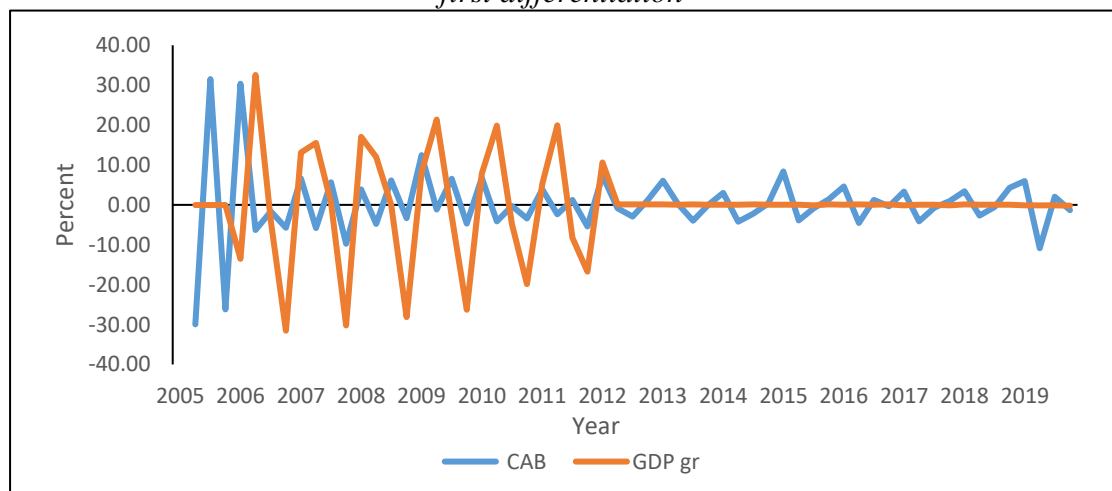
*State budget balance and current account balance in Bosnia and Herzegovina, after the first differentiation*



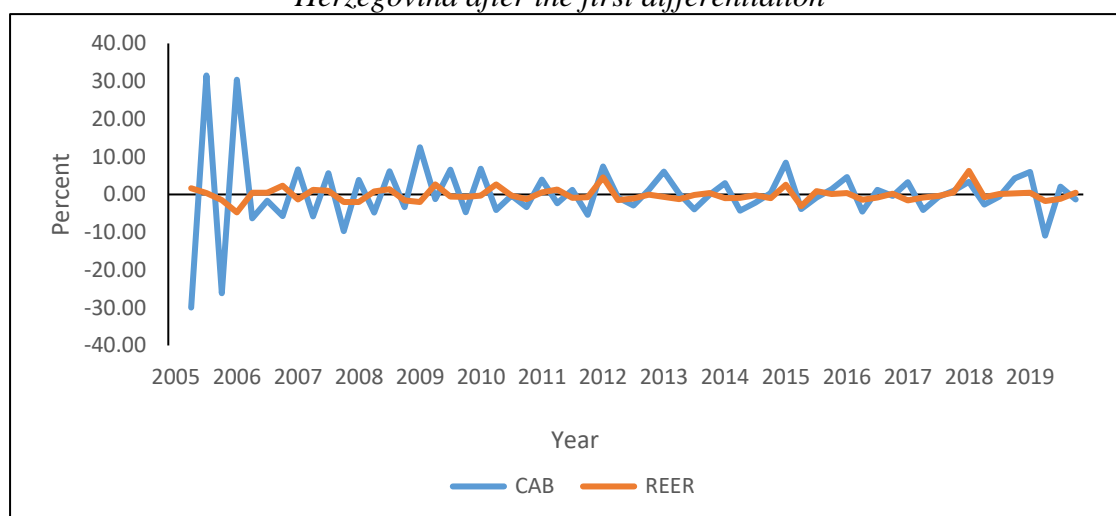
*Trend in current account balances and price indices in Bosnia and Herzegovina after the first differentiation*



*Trend of current account balances and changes in GDP in Bosnia and Herzegovina after the first differentiation*



*Trend of current account balances and changes in the real exchange rate in Bosnia and Herzegovina after the first differentiation*



## GLOBALIZING TALENT OPERATIONS AT TDK CORPORATION

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### ABSTRACT

*TDK Corporation, a well-known multinational electronics company that originated in Japan, has gone through a major business change - moving from household electronics to digital technology and components for mobile devices and industrial automation. The company also produces electronic materials, electronic components, recording and data storage media. There is no question that we live in a rapidly changing, unpredictable, and uncertain world where agility reflects a firm's set of capabilities to prosper and thrive in an unpredictable and rapidly changing environment (Vinodh et al. 2012). This paper examines how TDK re-engineered its talent operations to support its business model change during the Covid. The primary goal of this paper is to show how organizations that focus on value creation, dynamic capabilities, and strategic change may benefit from internal communications. As a secondary aim, this paper aims to show how efficient and successful communication support cultural alignment, increased employee engagement, and cultural confidence in the context of remote working and alternative employment conditions.*

**Keywords:** *Talent, Organization, Globalization, Innovation, Transformation, Japan, Technology, HR, International Relations*

### 1. RESEARCH METHODOLOGY

Based on a real-world scenario, the study was conducted. Some of the researchers who contributed to this study were actually present during this change management procedure (Levine et al., 1980; Yin, 2003). Participants of a group or community are observed in order to obtain an understanding of their society, often called "observing" (Allen, 2017). Because of the aforementioned, some writers might track several phases of the implementation process - corporate misalignment, the many phases of decision-making choices such as shifting global headquarters and talent operations to Germany, as well as the whole procedures of organizational and cultural integration, with the eyes of in-house full-time team members, from the start of the project until the end, in the context of remote working and social distancing restrictions imposed by the Covid-19 global pandemic. Research Objects: TDK HR employees in Japan and talent operations associates in Europe.

## 2. BACKGROUND

TDK Corp. (Tokyo Denki Kagaku Kogyo, 東京電機科学工業) TDK was created on December 7, 1935, in Tokyo. The firm started out by producing iron-based magnetic material ferrite and has since expanded into the manufacture of magnetic tapes for use with compact cassette tapes and videos. The firm boosted its operations by diversifying into blank CD-Rs and recordable DVD discs. The tape and disc industry was sold to Imation Corporation in 2007, as the worldwide electronics market was changing dramatically. Users of cassette tapes and CDs were rapidly switching to streaming music on portable devices and utilizing new sorts of music and video file playing technologies. The Global Financial Meltdown of 2008 had a significant impact on electronics manufacturers in Japan, while worldwide digitalization put Japanese firms into a thorny business innovation problem: grow, transform, or acquire new skills? In 2011, Sanyo Electric Co., Ltd. became a 100% owned unit of Panasonic, and in 2016, Sharp Corporation was acquired by the Taiwan-based Foxconn Group. Someone else sees profit in the situation, while someone else thinks it's an opportunity. As Toffler (1980) observed, violent changes now striking our planet. TDK, in order to keep up with worldwide deep tech movements, changed its business emphasis to Artificial Intelligence (AI) and the Internet of Things (IoT) in 2015, while also utilizing its core technologies for the manufacture of industrial sensors and semiconductors. The TDK CEO Shigenao Ishiguro signed off the move of the company's Global Headquarters from Tokyo to Munich, with most executive directors being required to hold dual positions - one in Japan and another in Europe. As of October 2019, under 10% of the global workforce at TDK was in Japan, while over 80% of the world's talent pool had joined the company through various strategic mergers and acquisitions. Andreas Keller has been implementing a series of policies and programs intended to modernize talent operations, redefine corporate architecture, and globalize the pool of TDK talent as General Manager for Global Human Resources with a dual assignment in Munich and Tokyo. Keller released a Global HR Midterm Plan 2018-2020 before taking office, which includes key performance indicators (KPIs) for each project. The goals include succession planning, defining global competencies, creating a long-term sustainable global culture of inclusion and engagement, upgrading talent management platforms, and raising awareness of international HR initiatives that are aided by a digital talent management system that was implemented to enable and track the integration of these activities. Keller went one step further, standardizing worldwide KPIs in order to make it easier for local and global management to monitor and manage risk while also improving resilience. "The objective isn't simply to tap into Japanese talent; we want to use it from all over the world. We'll need to establish comparable platforms and definitions for things like global competencies and evaluation criteria in order to do so," Keller adds (2018). After agreeing on a strategy for developing global talent operations standards and definitions, the TDK group all around the world realized that creating and sustaining a worldwide culture based on inclusiveness, participation, and value creation was a must. As a result, the firm's development of an agile and culturally guided global communications infrastructure to support this culture across the world became a top priority. The Covid-19 worldwide pandemic, which struck in January 2020, disrupted Keller's plans to launch the worldwide competence program and engage TDK Europe and TDK Japan personnel in utilizing cognitive technology and digital platforms for cross-divisional and cross-geographical collaboration.

## 3. LITERATURE REVIEW

Value is generated by meeting and fulfilling people's needs in order to satisfy demand. Corporates and academics alike have regarded value creation as a major business aim (Cicea et al., 2015). Some economists believe that value should be created not only for shareholders but for all stakeholders as well (Haksever et al. 2004; Harrison et al. 2010; Giosi et al. 2018); other academics advocate for mutual stakeholder partnerships in which stakeholders are both

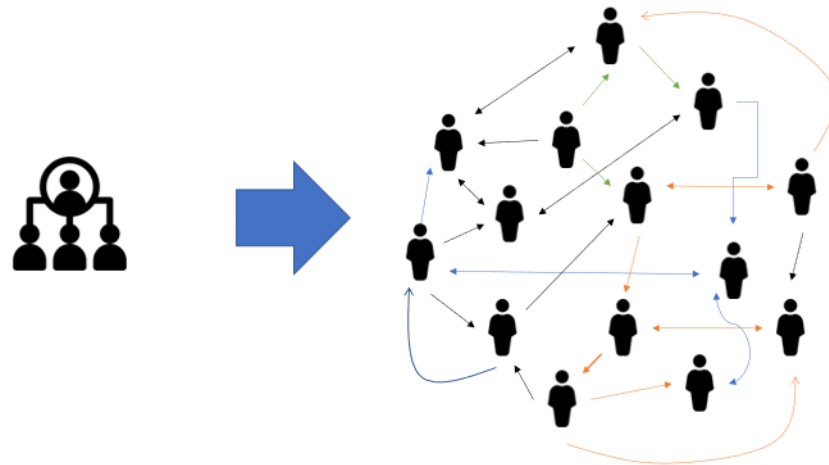


recipients and co-creators of value in joint value creation situations (Freudenreich et al, 2020). Superior user value, according to Gummerus (2013), leads to a competitive advantage. However, despite the numerous definitions and scientific analyses brought forth in order to define "value," no comprehensive consensus has been reached among academics (Anokhina, 2014). Value is a complex topic, according to Hassan (2012), and it isn't simply about pricing, quality, or location. It's drawn from the integration of various processes involved in how different users perceive a collection of encounters. Some experts believe that a company's value output may give insights into its performance (Cicea et al., 2015). Furthermore, committing to corporate value creation sharing helps keep skilled employees (Altman et al., 2020). Internal value, which is derived from the viewpoint of a shareholder, and external value, which is derived from the viewpoint of a customer, are described by Bititci et al. (2004). Furthermore, internal value implies that "value" is created by organizational income and profit, which it then converts into words. External value, on the other hand, refers to customers' and clients' perceptions and understandings of "satisfaction" in connection with the product, service, or business model. Employee happiness is another option to evaluate internal value (in the case of life science, pharmaceuticals, and healthcare organizations), which is influenced by knowledge management strategies such as knowledge acquisition, sharing, and utilization. The majority of writers presently acknowledge that value creation is increasingly reliant on or linked with intangible assets (Kaplan, Norton, 2004). Intangibles are non-material qualities that aid in the production of products or services, or that are expected to generate future economic benefits for the entities or individuals who control their use. Eustance (2000:31) states that intangibles are assets without physical existence, such as brand names and customer loyalty programs. An intangible asset is a non-physical, identifiable asset without monetary value, according to Kirk (2009). Intangible assets are recognized as a primary resource and driving force behind company success and value creation (Oliner et al., 2008; O'Mahony, Vecchi, 2009; Suriñach, Rosina, 2011; Holthausen, Zmijewski, 2018). Human capital, structural capital, and relational capital are the three types of intangibles. (Serrat, 2017; Altman et al., 2020) They are highly entangled, dependent on one another, and deliberately organized by managers and employees in order to generate long-term value. Direct investments are made at the beginning of the process in order to improve economic development (Cicea et al., 2015) and to promote both intangible and tangible assets, all with the goal of increasing value creation in every business or economy. In the context of remote working and digital value co-creation, people are more inclined to learn from and train each other if customized learning and engagement platforms, accessible across geographies on many linked devices, are made available across locations on a variety of connected devices, readily available by anybody inside the company (Law et al., 2019). Furthermore, cognitive technology-facilitated organizational culture integration by enhancing the potential for cross-cultural communication and by automatically tearing down organizational silos through the development of creative procedures (Vlad et al, 2019a). Collaborative technology and visual communications are key enablers in improving an agile organizational architecture that fosters the adaptation and utilization of collaboration technology to support the maintenance and quick updating of corporate culture throughout multidisciplinary teams (Vlad et al, 2019b).

#### **4. FROM HIERARCHY TO "WIREACHY" – CREATING A COLLABORATIVE PLATFORM FOR GLOBAL INTERACTIONS**

At the outset of 2020, as the TDK HR team was preparing to launch the recently created Global Talent Competencies and assess talent development across borders, the worldwide epidemic of Covid-19 struck with unforeseen limitations on international travel and face-to-face interview assessments. Due to the sensitive nature of the talent evaluation meetings, most Japanese and European CEOs believed that online alternatives were unworkable and proposed delaying

executive succession plans and the development of new talent pipelines. Nobody could have predicted how long the turmoil would last or what the company's ultimate financial impact would be, but Keller's team recommended aligning talent operators across the world on a set of new rules, one of which was to de-centralize decision-making for people-related issues and encourage each entity to adopt a "wirearchy" mindset, as described by Husband (2014). By doing that Keller wanted to understand, anticipate and adopt evolution of work, knowledge transformation and organizational structures as they are moving from hierarchies to wirearchies.



*Figure 1: The Future in Continuous Transformation, JCE Japan Creative Enterprise Material (2019)*

Wirearchy is defined as a dynamic two-way flow of power and authority, based on knowledge, trust, credibility and a focus on results, enabled by interconnected people and technology (Husband, 2014). Shifting to a more decentralized, connected way of doing business will not only encourage faster information sharing throughout the company but will also enhance personal accountability and promote cross-divisional cooperation and transfer of competencies. It will also increase the need for cooperation, expand the amount of resources available and make employees anticipate future. A survey of Japanese workers conducted by JCE Japan Creative Enterprise in February 2020 found that less than 25% believed in independent, remote working, and less than 20% thought that significant cross-geographical collaborations were possible. This was due, in part, to cultural and linguistic differences. According to people managers in Europe, corporate HR was being too invasive and there was no business-related cause for talent information to be shared across geographies. People-related data could not be shared because of the GDPR, and as a consequence, talent operators from all across Europe were becoming increasingly hesitant to participate in global people operations or talent data-sharing initiatives. Despite local resistance to cross-regional cooperation, Keller urged his employees to consider a wide range of digital technology implementation in the light of future barriers to international mobility and the necessity for talent development talks solely within the digital realm. Talent managers were reluctant to do so, but they reluctantly examined SAP SuccessFactors, UiPath RPA services, and IBM Your Learning, an intelligent learning management system (LMS) powered by IBM Watson artificial intelligence (AI), allowing workers to access personalized learning content based on their interests and goals. The Covid-19 epidemic, which began in late February 2020, has brought further restrictions to global travel. TDK announced on March 26, 2020, that all international business trips would be put on hold until further notice.

On April 4, 2020, TDK Europe and Japan committed to using Successfactors, RPA, Your Learning, and other digital talent management systems as well as learning and development platforms in both Europe and Japan.

#### 4.1. Organizational Impact

Keller adopted a three-pillar strategy to change in order to expedite the introduction of new technology across borders. He recognized the importance of investing in re-skilling talent worldwide and creating a collaborative culture throughout the company, assisting workers in developing technical expertise to make the most of the new cognitive technology. Keller decided to rely not just on technology, but also on human talent in order to encourage global dexterity and cultivate a collaborative mindset throughout the company. He stimulated intellectual curiosity among employees by encouraging them to pursue mastery of their chosen subject areas with Emotional Intelligence and Cultural Intelligence (CQ).



Figure 2: Skilling, Re-Skilling, Up-Skilling, JCE Japan Creative Enterprise Material (2020)

Through the adoption of intelligent learning platforms, TKD offered employees the opportunity to access professional learning material aligned not only with their own transformational goals, but also with their own individual interests and aspirations. Thus, TDK employees in Europe and Japan were offered the opportunity to familiarize themselves with the newly adopted technology at their own pace, on a device and location of their own choice.

#### 4.2. Remote Work and the New Normal

Although the notion of remote working was relatively new to Japanese business prior to the Covid-19 epidemic, most firms have utilized and tested various collaboration technologies such as video conferencing platforms and numerous automated solutions in the last year. During the third year of the pandemic, TDK employees were hesitant to use digital collaborative technologies at first; however, prolonged remote working situations influenced employee mindsets and behavior, resulting in digital dexterity and collaborative literacy. They would want to continue working remotely at least for a certain amount of their time, and they would be interested in exploring different employment possibilities after the end of the pandemic. Concerns have been raised about psychological health and social isolation, as a result of a lengthy remote working arrangement. Globally, over one-third of all employers will take steps to provide employees with a feeling of community, connection, and belonging through digital technologies in order to address the well-being issues presented by the move to remote work (World Economic Forum, 2020.)

The results of a second pulse survey completed in December 2020 showed that 65% of the staff population was in favor of independent, remote working without expecting detailed instructions from their manager. Significant cross-geographical collaborations were viewed as possible by 78% of those polled globally, while 83% thought the new way of working was more appropriate for their living circumstances. When asked whether they would consider going back to the workplace full-time in 2021 as part of an individual interviews conducted in Japan and Europe, 88 percent of respondents said they would not. The participants also showed interest in a mixed workstyle that allows them to pick and choose between corporate office space and remote working choices based on business need, client requirements, and personal circumstances.

## 5. CONCLUSIONS

- 1) Even though cognitive technology's advantages in talent operations are apparent, a lack of knowledge, fear of change, and need for reskilling prevent it from being implemented.
- 2) The unforeseen need for cooperation, which arrived with the Covid-19 epidemic from overseas, hastened the adoption of digital technology in a variety of business operations.
- 3) MNCs from Japan may benefit from utilizing cognitive technology to speed up global talent management and develop cross-regional engagement.
- 4) Personalized learning platforms give multi-device learning possibilities to employees, fostering their intellectual curiosity and changing the way they learn.
- 5) After the Covid-19 pandemic, remote working and alternative employment options will most likely continue and develop. Businesses will need to establish new working arrangements in order for their operations to operate at optimal efficiency after the Covid-19 epidemic.

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## **THE SIGNIFICANTE OF INDUSTRY 4.0 AND INDUSTRY 5.0 FOR THE FUTURE FUNCTIONING OF COMPANIES – COMPARATIVE STUDY**

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### **ABSTRACT**

*In the past, thanks to the industrial revolutions (1st-3rd), we got various inventions that made life easier for humanity. It is the same now. All countries in the world are affected by the fourth industrial revolution (Industr 4.0), which originated in 2011 in Germany. Industry 4.0 consists of several elements that positively and negatively affect the working and personal life of people. On the one hand, Industry 4.0 simplifies business processes, facilitates the work of employees, and increases the company's performance and the country. But on the other hand, there is a significant change in the labour market when the requirements for job applicants change. IT skills, creativity and analytical thinking come to the fore, for example skills that digital technologies do not possess. While the fourth industrial revolution is focused on new technologies and digitization and their implementation in business processes or public services, the net fifth industrial revolution (Industry 5.0) represents a shift from technology back to a person. The emphasis is on sustainability and resistance to change. We use element scientific methods in the article - analysis, synthesis, comparison, induction and deduction. The article aims to provide the element characteristics of the concepts of Industry 4.0 and Industry 5.0, based on the analysis of foreign scientific works, to identify their benefits for the future functioning of enterprises, as well as their common features and crucial differences.*

**Keywords:** *Industry 4.0, Industry 5.0, Technologies, Human, Sustainability, Resilience*

## **1. INTRODUCTION**

Industry 4.0 emerged gradually in chronological order. The beginning was the first industrial revolution taking place in the period from 1760 to about 1820-1840 (Wrigley, 2018). It was characterized by the use of steam power and mechanical production. The first industrial revolution developed the field of textile production, iron industry, glass industry, agriculture, chemicals, transport, mining and others (Vinitha et al., 2020). The so-called second industrial revolution industrialization (Industry 2.0) was built on the first and started in the late 19th century and early 20th century (Hull, 1999). It brought with it mass production with the help of developed machine tools. This revolution also used new technologies at the time, such as electricity, telephones, gas, internal combustion engine, railway networks, water supply, sewerage and telegraph (Vinitha et al., 2020). Industry 3.0 began in the 1970s with the use of automation through computers, and later industrial robots were incorporated into the practice. This advantage was highly valued in engineering, for example, due to its efficiency and reliability. The disadvantage was that the human factor took a backseat to machines which were reflected in the increased unemployment rate (Vinitha et al., 2020). Industry 4.0 was first presented in 2011 at a trade fair in the German city of Hannover (Polat, Erkollar, 2020). It is also called the fourth industrial revolution, which brought advanced developments in technology. With the use of the Internet of Things, the cost of using cables and wires has been significantly reduced in the company, which has brought control to the cloud system in enterprises (Rojko, 2017). A cyber-physical system was developed, which represented the interconnection of all systems through machine learning technology and cloud computing (Grieco et al., 2017). Breque et al. (2021) stated that Industry 4.0 emerged as a chronological continuation of its predecessors. However, Industry 5.0 is not a direct successor to Industry 4.0. Shortly after companies decided to adopt Industry 4.0, the concept of Industry 5.0 emerged, which is future-oriented, complements and extends the typical features of the fourth industrial revolution, but is characterized as a different type of industrial revolution. The article aims to provide the element characteristics of the concepts of Industry 4.0 and Industry 5.0 based on the analysis of foreign scientific works to identify their benefits for the future functioning of enterprises, their common features and main differences.

## **2. LITERATURE REVIEW**

### **2.1. Industry 4.0**

The fourth industrial revolution brought with it several principles by which it can be characterized. It is about taking into account connectivity, decentralized decision-making, technical assistance, information transparency, touch operability, human factor, intelligence, technology, organization and perception of production (Cañas et al., 2021). The essence of Industry 4.0 is an autonomous system that is used by technology such as artificial intelligence that brings decision-making capability. Even though it thinks about the good of consumers, it abstracts from the human factor. It is the emergence of cybernetic-physical systems, that serve to connect production equipment using the Internet of Things, cooperating robots and artificial intelligence (Polat, Erkollar, 2020). The initiative of Industry 4.0 is, thus, manifested in the principle of ensuring cyber security, safely used and shared data, and reliable communication between the company and its surroundings (Xu et al., 2021). Enterprises that use 4.0 technologies are starting with a modular system, which means that production machines communicate via the Internet, so they work without human assistance. Thus, processes can be controlled virtually, and, thus, businesses become intelligent. On the one hand, it has the effect of reducing the time required and costs. But on the other hand, increasing productivity and improving the performance of the company (Polat, Karakuş, 2019). Industry 4.0 consists of many elements and technologies.

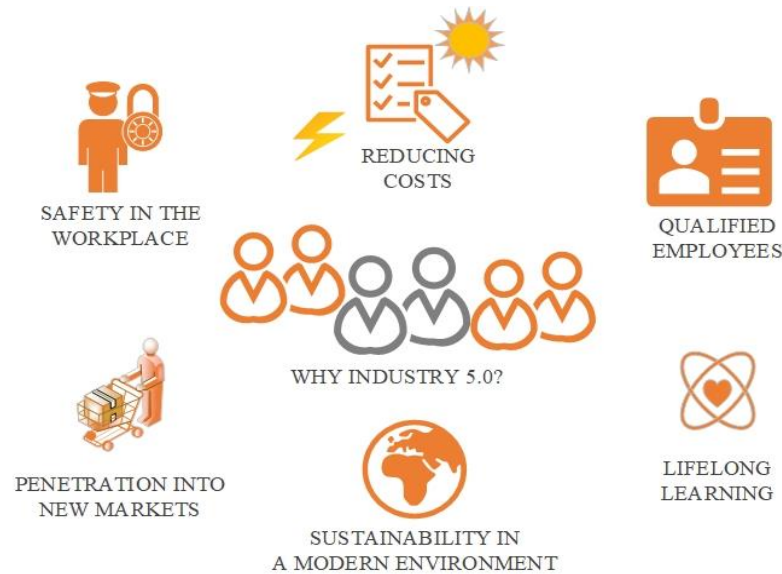
It is, for example, Business Intelligence, artificial intelligence, digitalization, robotics, virtual reality, Big Data, cloud computing, etc. When the technology is used in the manufacturing industry, it is the Internet of Things (IoT), similarly, when it is used in the service sector, it is called the Internet of Services (IoS). It is beneficial to be able to use services in one network managed from a centralized system. On the one hand, this contributes positively to the autonomy of companies, but on the other hand, it brings several threats. It is mainly about security, which is disrupted by cyber attacks (Polat, Karakuş, 2019). Therefore, the element condition of the fourth industrial revolution is an accessible Internet, which enables the very modest connection of billions of people in a globalized environment. Storage capacities are increasing, and the size of the carriers is getting smaller and smaller. There is a lot of data available. Cyber-physical systems are the basis for IoT and, together with the Internet, form the basis of Industry 4.0. IoT, in turn, represents the principle according to which the majority of things in the common network should work in the future. IoS represents an infrastructure that uses the Internet as a medium for offering services, such as Amazon (CEO Forum, 2021). Authors such as Xu, Lu, then Li and Kim were the pioneers in the development of Industry 4.0. The Internet of Things was first addressed by Xu, who described the transition from radio frequency identification to wireless sensor networks. Lu and Li analyzed the present trends in Industry 4.0, which they also applied to the modernization of Chinese industry under the name of the "Made-in-China 2025" project. Kim was focused on cybernetics and IT trends. Zhang and Chen followed it up with new elements, namely Blockchain and business analytics (Zarzuelo, 2021). Elements of Industry 4.0 are used in building smart and sustainable cities. According to Thaver (2019), whose subject of interest was the "Smart Port City" concept, Industry 4.0 techniques were also applied in Barcelona and Hamburg to build smart cities. Smart lighting, buses and bus stop, intelligent solutions for water and parking were placed in cities, and smart waste management was also promoted. These smart solutions bring their benefits transformed into lower costs, higher revenues, more satisfied citizens and an increase in the employment rate. An interesting project focused on the connectivity of sensors and cameras, the use of the Internet of Things and the development of Wi-Fi around the port took place in Rotterdam as well. Technologies of the Internet of Things, cloud and fog computers and Big Data technologies as elements of Industry 4.0 can also be provided in the field of healthcare, based on which Healthcare 4.0 was also created. This revolution radically changes the health services and products provided. Today we can see the results of the fourth industrial revolution in the health sector using, e. g. smart cards, robots, smart and mobile phones, sensors, etc. The quality and availability of medical software applications have also increased. the creation of new biology of each person, groups of patients are no longer grouped into treatment groups, which brought its benefits in the form of a reduction in the number of hospitalized patients, a reduction in the size of the healthcare budget, and the consumption of inappropriate or unnecessary drugs was also minimized (Aceto et al., 2020). Businesses are aware of every fourth industrial revolution but are still afraid to invest because of the possible risks. Risks and barriers limiting companies from investing in Industry 4.0 technologies include, for example, an unstable situation and the related possible crisis with limited financial resources, big problems with investment data security, gaps in knowledge about Industry 4.0, IT skills, difficulties in training the workforce, qualified with the necessary skills and other components of their human capital, as well as the willingness to learn and many others. The governments of individual countries should support businesses to invest in 4.0 technologies, as without government support there is a risk of widening the economic gap. From the point of view of businesses, it is the same that they may lose competitiveness in the market. In terms of the application of Industry 4.0 technologies, several surveys have confirmed that small businesses in their Internet of Things business, medium-sized enterprises Big Data and large enterprises have cyber security.



The least applied technology in small businesses is 3D printing and medium and large businesses autonomous robots (Yüksel, 2020). The elements and technologies of Industry 4.0 bring several benefits, such as reducing costs, increasing the efficiency of business processes, increasing performance, competitiveness in the market and the final consequences and increasing the value of enterprises for their interested groups (Đurišová et al., 2021). Important is that we get the maximum benefit from this progress and abstract from the latest influences, that is, learn to work with them.

## **2.2. Industry 5.0**

Industry 5.0 was defined in Japan in 2016 and is still a question of the future. Industry 5.0 is a next-level industrialization model characterized by the return of labour to factories, distributed manufacturing, intelligent supply chains, and hyper-customization, all aimed at providing tailored customer experiences (Zuthi, 2019). The step forward is mainly the direction toward a sustainable, human-centred and resilient industry (Polat, Erkollar, 2020). From the above, it follows that three elemental pillars are typical for Industry 5.0, namely focuses on people, sustainability and resilience. A basis is a human-centred approach. It means using technology to adapt the production process according to the needs of the employee, it also includes his management and education. It is required that the use of new technologies does not interfere with the fundamental rights of employees, such as the right to privacy, autonomy and human dignity. For the industry to respect the limits of the planet, it must be sustainable. It is necessary to develop circular processes that reuse, reassess, and recycle natural resources, and reduce waste and its negative impact on the environment. Resilience refers to the ability to flexibly cope with change. Globalized value chains and markets are increasingly susceptible to disruptive change. By being resilient in itself, an industry can significantly contribute to the resilience of the whole society and ensure that production is sustained and workers can continue to work (Breque et al., 2021). In this context, it is necessary to set up strategies that are not primarily aimed at achieving the company's profit and creating value not only for shareholders, but also at increasing value and prosperity for all its stakeholders. The fact that Industry 5.0 is focused on people is that it supports their talent, strengthens their position in society, and thus forces them to lifelong learning. It has a very good effect on the economic maturity of the society, thereby increasing the gross domestic product (GDP) of the country. Industry 5.0 is also resilient and flexible to adapt to new technologies. The main change compared to other industrial revolutions is sustainability, which emphasizes the importance of respecting the ecology and the limits of our planet (I-Scoop, 2021). The production of enterprises is constantly on the rise, therefore Industry 5.0 must respect planetary boundaries. Sustainability, as one of the values of Industry 5.0, is thus ensured by a form of circular economy, which leads to the efficient use of resources. In the event of a crisis due to geopolitical changes or natural emergencies, the value of resilience is also in the foreground, which tries to protect industrial production in unexpected situations (Xu et al., 2021). The fifth industrial revolution focuses mainly on the sustainable, flexible industry, where people come to the centre of events. It can be concluded that Industry 5.0 provides a solution for people and our planet. It may seem that Industry 5.0 is just a reflection of the unceasing trend to be greener, both as a company and as a business. However, the industry's driving forces are not new, just adapted to modern fast-paced lifestyles (I-Scoop, online). Industry 5.0 builds on the technologies of Industry 4.0, such as digitization, Big Data and artificial intelligence, emphasizing the role that these technologies can play in solving new, emerging requirements in the social and environmental fields. The requirement is that the deployment of new technologies adapts to the worker and not the other way around. It is about using technology for circularity and sustainability (Breque et al., 2021).



*Figure 1: Industry 5.0 as problem-solver  
(Source: own processing)*

Therefore, businesses should think about implementing these ideas and modern technologies. The advantages (Figure 1) are that costs are reduced, as resources begin to be used efficiently. Employees become skilled, remain in control of the business and achieve a certain authority within their profession. It is exactly what leads to competitiveness, which attracts as many talented people as possible to the company. And this will also increase interest in lifelong learning and striving to be the best, not easily replaceable. Developing new skills will increase competitiveness in new markets and improve well-being and safety in the workplace (European Commission, 2021). Technologies based on the fifth industrial revolution have already brought with them several complementary concepts, such as Hospitality 5.0 or Society 5.0. Technologies are welcomed not only by doctors, who can better focus on critically infected patients with Covid-19 disease, as a result of which they can more reliably define treatment but also by the loss of medical students, for whom technology facilitates the acquisition of necessary medical training during the pandemic (Avoid et al., 2020). Industry 5.0 also affected the catering and accommodation sector during the pandemic. The time when increased hygiene is taken care of, and the hygiene of establishments where a lot of people are changing, required the application of elements of the fifth industrial revolution, which at the same time increased the competitiveness between hotels and restaurants. The task of Hospitality 5.0 technologies was to ensure more effective safety, cleanliness and hygiene on the customer's journey using contactless technologies. Technologies are meant to help employees focus on more important things while general cleaning duties shift to visual monitoring of disinfection stations (Pitrelli, 2020). Another example of the use of Hospitality 5.0 technologies is when cooking robots complete tasks, while the chefs themselves can devote the saved time to developing new recipes and menus, sensory evaluation, meeting specific customer requirements, and so on (Park et al., 2017). As one of the leading technological nations in the world, Japan strongly supports Industry 5.0 by defining its goal as the use of advanced technology for the benefit of society. As Japan has a large number of elderly people in its population and frequent natural disasters, by applying the characteristics of Society 5.0, it tries to prevent population decline, enable solutions to facilitate and improve the living conditions of the elderly, create a sustainable environment and carry out its activities for the benefit of society using technology. As a result of fulfilling the set goals, Japan will ensure a better quality of life for its population (Özdestici, 2019; Harayama, 2017; Federation, 2016).

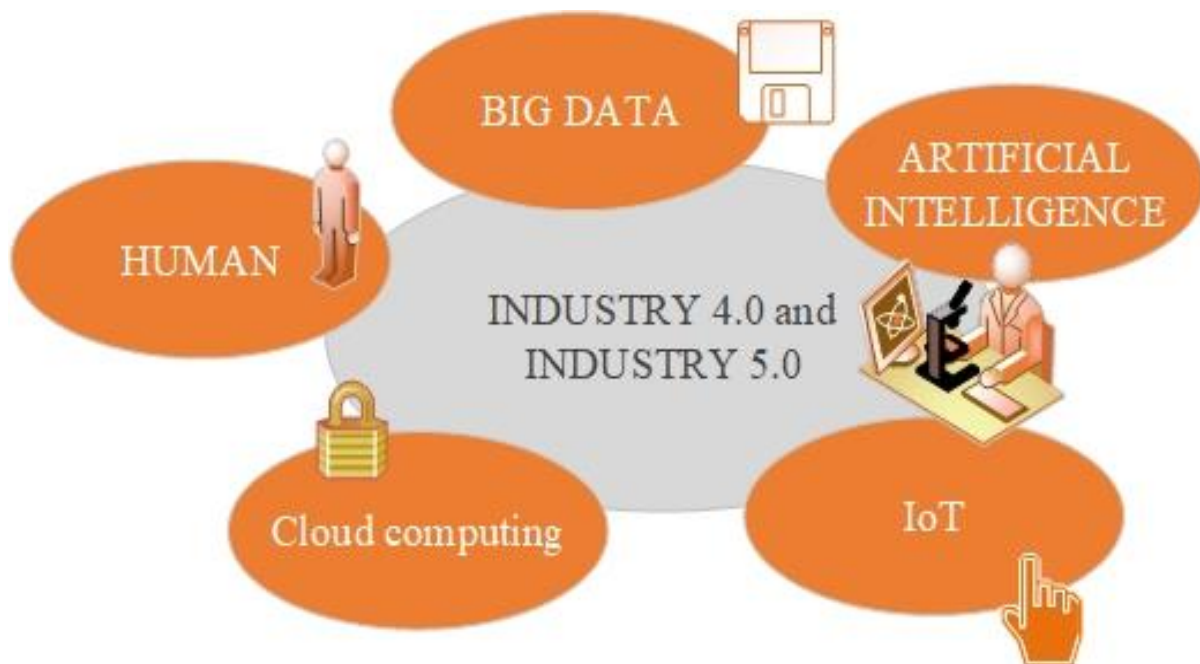
### 3. METHODOLOGY

Several scientific methods were used in the article, especially a systematic review of the literature, which includes the analysis of professional articles, the synthesis of acquired knowledge but also induction and deduction, which were necessary for the formation of conclusions. The article aims to provide the element characteristics of the concepts of Industry 4.0 and Industry 5.0, based on the analysis of foreign scientific works, to identify their benefits for the future functioning of enterprises, as well as their common features and crucial differences.

### 4. RESULTS

#### 4.1. Common features of Industry 4.0 and Industry 5.0

From the analysis of various foreign literature, we found out not only what distinguishes Industry 4.0 and 5.0 but also their common features. We can also identify their common parameters (Figure 2) through the relationship between Industry 4.0 and complementary concepts to Industry 5.0, e. g. through Society 5.0. It goes, for example, o Big Data, artificial intelligence, IoT, cloud computing and the person himself, who cooperates with these systems and is of course influenced by them (Polat, Erkollar, 2020).



*Figure 2: Common features of Industry 4.0 and Industry 5.0  
(Source: own processing according to I-SCOOP, 2021)*

According to Polat and Erkollar (2020), the present age is so advanced that information is everywhere around us. They accumulate in our smartphones, cars, production machines and other devices through sensors, such as location sensors, and temperature or humidity measurements. Big Data is created at the moment the acquired data is transferred to the computer. These are characterized by the necessary cloud system, scalability, automatic processing and use in production, consumption or mobiles. In production operations, data is received from machines, and thus industrial Big Data is created. With the help of artificial intelligence, the data is processed so, that it is usable for the desired purposes. A new generation of the industrial revolution is being created here. Even Society 5.0 uses the collected digital data, creating the so-called social Big Data.

When machines can make their own decisions, solve problems, and act thanks to programmed algorithms and calculations, unlike machines that need to be given commands by humans. Then, we can talk about artificial intelligence. Artificial intelligence can be applied in various fields. Industry 4.0 is used in intelligent production. Society 5.0 plans to create a new artificial intelligence that will work for the benefit of the community by using raw data in digital media through various applications. In both, Industry 4.0 and Society 5.0, the last but not least common parameter, the Internet of Things, is used. IoT is used to secure a global network to communicate with every object on the network. It also supplies devices and sensors necessary for object communication, and by combining these two things, participates in the creation of new business and market opportunities. Using the infrastructure of the Internet of Things, it is possible to create smart factories and companies. The goal of cloud computing or cloud computers is to focus on storing big data in a virtual environment called the cloud. It also enables the continuous availability of big data to its users. As Industry 4.0 uses the global Internet infrastructure to provide data and services to the objects around it, the importance of cloud computing is great. Even Society 5.0 actively uses and needs cloud computing if it wants to provide the highest quality services for communities and the environment. Thanks to cloud services, it is possible to store collected digital data for future use. Ultimately, the common feature of Industry 4.0 and Industry 5.0 is a person who is greatly influenced by the development of technology. Although Industry 4.0 focuses on the production and consumption of a more specific sector, consumers have the opportunity to obtain products in a shorter time, with lower costs and greater satisfaction. Industry 5.0 focuses on all people, offering a personalized approach according to their needs. A common feature is that both revolutions need qualified employees.

#### **4.2. Identified differences between Industry 4.0 and Industry 5.0**

Industry 4.0 makes large services to the enterprise, while Industry 5.0 integrates cyber and physical systems for individual or joint use, creating services for humanity (Polat, Erkollar, 2020). Both concepts contain both positive and negative aspects, from which it is necessary to abstract and extract as much as possible from them for the progress of humanity as such. The industrial sector can be at the forefront of such developments, such as its access to advanced technologies and the availability of high investments for the implementation and experimentation of new ideas. The concept is centred around the integration of information technology with truly close connectivity in businesses. Individual definitions of products, services and various solutions are developing in Industry 5.0, which is characterized by the era of experience (Zutshi, 2019). In Industry 5.0, customer aspirations will drive market interests toward hyper-customer customization. Individual products will more and more resemble the customer's requirements, and thus will be manufactured according to their wishes. However, for such customization to occur, manufacturers will have robotic smart factories located globally around the world to be able to mass produce the basic product design. The semi-finished products will then be sent to local factories, where they will be completed by hand to the final product stage. The supply chain will become responsive and will result in changes in existing jobs. However, new jobs associated with data monitoring and control will be created. Machine maintenance and quality assurance will be combined, and thus an external worker will not be needed to perform these services (Zutshi, 2019). It is also confirmed by Rossi (2020), according to whom Industry 4.0 leads to Industry 5.0 when it allows customers to customize the product according to their wishes. If the entrepreneur has the right technology, he can adapt the product to the end customer based on online communication through various configurators (Ližbetinová et al., 2019). It can go about a passenger car, where hundreds of different variables can be selected, not only colours, headlights and interior accessories, and several other applications. Industry 5.0 takes the concept of personalization to a higher level.

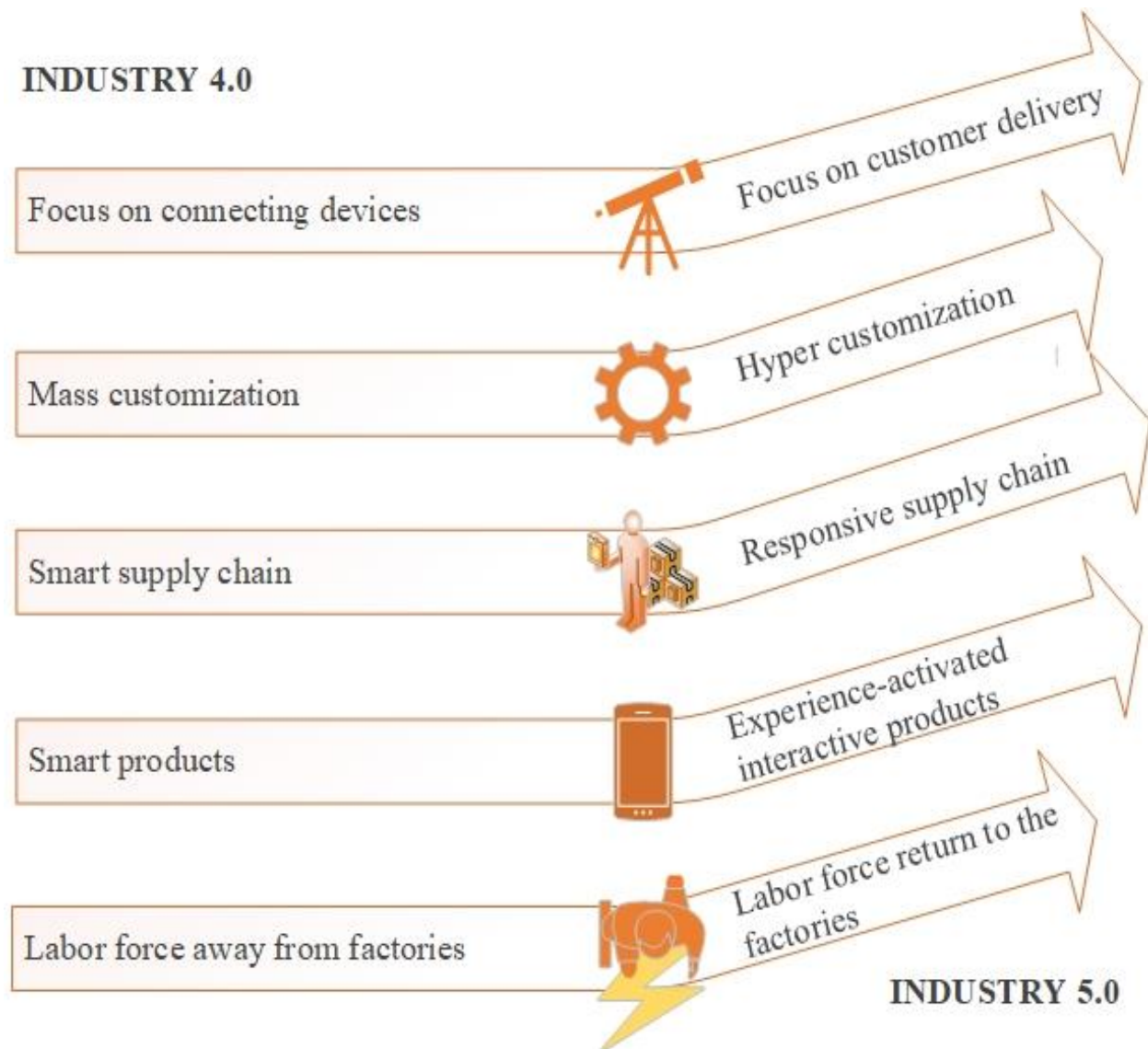


Figure 3: Industry 4.0 compared with Industry 5.0  
 (Source: own processing according to Zutshi, 2021)

While Industry 4.0 focused on connecting devices, mass customization of customer requirements, intelligent supply chain, intelligent products, and so power away from the factory, Industry 5.0 focuses on order delivery, hyper customization of their interest, supply chain adaptable to current customers, experiences actively interactive products and especially for the return of labour to the factories with an appeal to its increasing labour output (Figure 3). The main differences that emerged from the analysis of other foreign database publications are that Industry 4.0 is focused collectively on customers and employees, while Industry 5.0 pays attention to the individual requirements of customers and employees and their lifestyles. In the foreground, however, is the interest of the entire company. The purpose of Industry 4.0 is commercial, while in 5.0 it is public. In the case of Industry 4.0, there is less focus on social value and sustainability, but with Industry 5.0 there is respect for planetary boundaries. The goal of Industry 4.0 is to increase the efficiency of production, and Industry 5.0 is to support industry, and services for humanity and the planet. While Industry 4.0 is focused on creating value for shareholders, Industry 5.0 is oriented toward creating value for all interested groups (Table 1).

<b>SIGN</b>	<b>INDUSTRY 4.0</b>	<b>INDUSTRY 5.0</b>
<b>ORIGIN AND YEAR</b>	Germany/ 2011	Japan/ 2016
<b>MAIN DOMAIN</b>	the manufacturing sector, including customers and employees	the whole society and their lifestyles
<b>ACCESS</b>	holistic	individually for the customer
<b>PURPOSE</b>	commercial	public
<b>PEOPLE</b>	partially engaged	mostly engaged
<b>SUSTAINABILITY</b>	low focus	respecting planetary boundaries
<b>R&amp;D</b>	focus on digitalization and technology	focus on the importance of research and innovation
<b>THE GOAL</b>	increase in production efficiency	industry support, service to humanity and the planet
<b>PROPULSION</b>	technologies	values
<b>COVERAGE</b>	production and consumption of a specific sector	all people

*Table 1: The main differences between Industry 4.0 and Industry 5.0  
 (Source: own processing according to Polat, Erkollar, 2020)*

The result of the comparison is the conclusion that the ideas of both concepts spread relatively quickly among mainly developed countries as a result of globalization. Both can influence people in specific areas with a new social structure. However, the concept that will significantly affect people's way of life, the social aspect of the country and the structure of society are Industry 5.0 and the complementary concept of Society 5.0.

## 5. CONCLUSION

The current approach of operating businesses based solely on profit is increasingly unsustainable. In a globalized world, a narrow focus on profit does not properly consider environmental and social costs and benefits. For the industry to become a provider of real prosperity, the definition of its true purpose must include social, environmental and societal aspects. It includes responsible innovation, not only primarily aimed at increasing cost efficiency or maximizing profit but also at increasing value for all stakeholders, such as investors, employees, consumers, suppliers, society, and so on. While the fourth industrial revolution (Industry 4.0) is focused on connecting devices, data analytics and artificial intelligence technologies to further automate processes, the fifth industrial revolution (Industry 5.0) is focused on cooperation between man and machine. It is advantageous because human intelligence works in harmony with cognitive computers.

*Figure following on the next page*



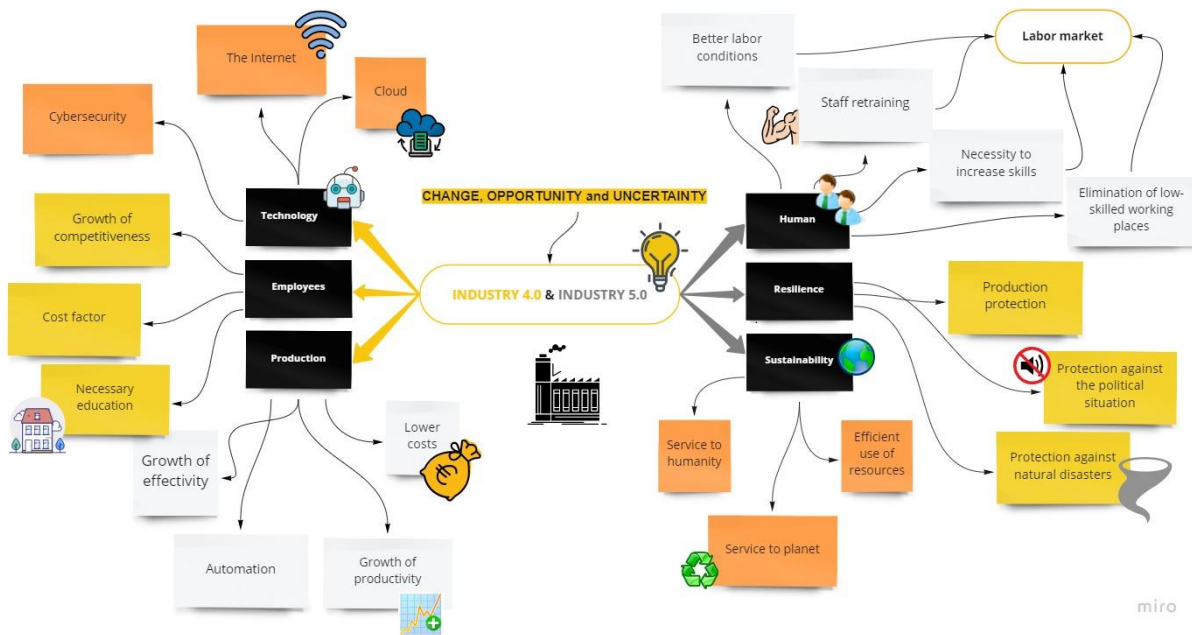


Figure 4: Comparison of elements, technologies and impacts of Industry 4.0 and Industry 5.0  
 (Source: own processing)

By returning labor to factories, workers become more qualified to perform tasks. It will add value to manufacturing as such, leading to mass customization and personalization for customers (Figure 4). This fact will require employees to train and acquire more diverse skills for the given job position.

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## ACCESSIBLE TOURISM IN THE NATIONAL PARKS OF THE REPUBLIC OF CROATIA

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### **ABSTRACT**

*Today's tourism is becoming increasingly socially responsible and accessible to all types of tourist demand, from younger generations, gray-haired tourists to vulnerable groups. All megatrends point to these facts. Social responsibility in the form of accessible tourism is of extreme importance for the development of certain tourist destinations and areas. Tourist offer needs to be adjusted to people with disabilities, who are part of the tourist demand. Accessible infrastructure, multidisciplinary approach to the guest and understanding of all stakeholders in tourism towards vulnerable groups are important factors in creating a specific tourist offer. Considering that tourist communication is based on direct access to the guest, it is necessary to use different methods and tools to approach people with disabilities. In terms of the necessary adaptation of tourism content for people with disabilities, the aim of the paper is to show the extent to which there are tools for easier interpretation of the content within the national parks in the Republic of Croatia. Empirical research is focused on the identification and analysis of the existence of: adapted websites for people with visual impairments, parking spaces for the disabled, lines for easier orientation, tactile digital sensors, adapted mobile applications, audio descriptions at locations, adapted sanitary facilities and other. The research instrument was an in-depth interview, and the research was conducted on a convenience sample consisting of directors of Croatian national parks. The contribution of the work is reflected in the presentation of the current state of equipment of the national parks for the needs of the development of accessible tourism.*

**Keywords:** *accessible tourism, people with disabilities, national parks*

### **1. INTRODUCTION**

According to the latest Report of the Croatian Institute of Public Health (2021), almost 600,000 people with disabilities live in the Republic of Croatia, which is about 14.4% of the total population. In order to create an insight into the extent to which these segments are involved in tourism, an empirical study was conducted on a sample of six National Parks in the Republic of Croatia. In addition to the empirical work, the paper presents the terminology of accessible tourism, from its definition to current findings in the form of certain barriers. Possible solutions are given for the barriers.

### **2. ACCESSIBLE TOURISM**

Studying the available scientific and professional terminology, numerous definitions of accessible tourism can be noted, which indicates that there is no generally accepted terminology for this term.

In the following Table 1, several definitions of accessible tourism are presented, which have in common the mention of the necessary mobility of tourism consumers in this form of tourism.

Author/s	Year/page	Definition
Darcy & Dickson	2009/p. 33	Accessible tourism is a form of tourism that enables people with different access requirements in terms of mobility, vision, hearing, and cognitive dimensions to function independently, equally and with dignity when using universally designed products, services, and environments in tourism. This definition includes people with permanent or temporary disabilities, the elderly, families with small children and those working in socially sustainable designed environments.
UNESCAP	2009	Accessible tourism is also known as "accessible tourism", "universal tourism", "inclusive tourism", "and in some countries such as Japan, "barrier-free tourism". Accessible tourism is tourism and travel that is accessible to all persons, including persons with disabilities, including persons with difficulties with movement, hearing, sight, psychosocial or intellectual disabilities, as well as elderly persons and persons with temporary disabilities.
Miller, Vandome & McBrewster	2010	Accessible tourism is constantly ensuring the availability of tourist destinations, products and services to all people, regardless of their physical limitations, disability or age. It includes tourist sites in public and private ownership. Accessibility improvements are not only beneficial for people with permanent physical disabilities, but also for parents with small children, the elderly, people with temporary injuries such as a broken leg, and their companions.
Nursanty, Anwar & Mohamadi	2013/p. 9	Accessible tourism is a form of tourism that involves a collaborative process between stakeholders that enables people with access requirements, including mobility, vision, hearing and cognitive dimensions of access, to function independently, fairly and with dignity through the delivery of universally designed tourism products, services and environments.
Komnes, Tanković & Kletečki	2018/p. 258	The term accessible tourism refers to destinations that develop a tourism offer that is accessible, i.e., accessible to all people, adapted to children, the elderly, the sick and persons with special needs, regardless of physical limitations, disability or age.
Catela	2020	Inclusive tourism is a segment of tourism accessible to everyone whose task is to create an environment in which all tourist destinations, products and services are accessible to everyone in order to enable mobile, visual, auditory and mental accessibility so that all users of tourism services can act independently, equally and with dignity on the tourism market.

*Table 1: Defining accessible tourism  
 (Source: authors)*

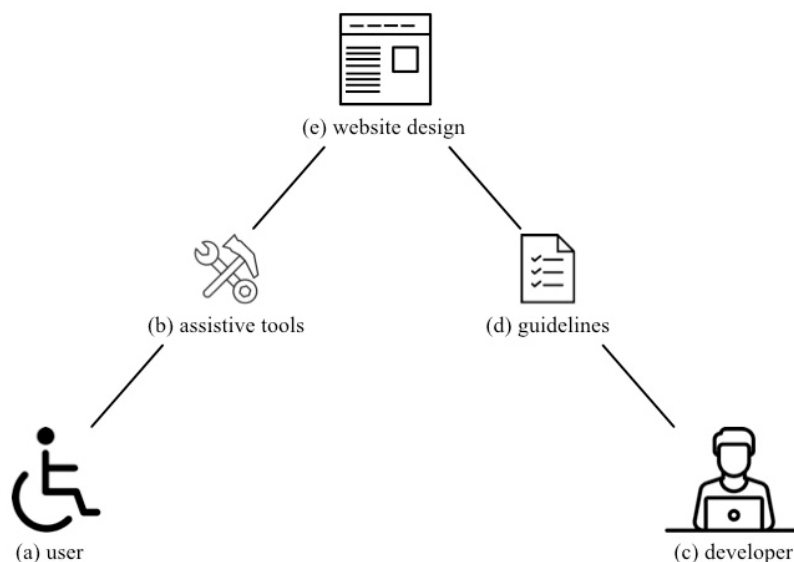
From the above definitions, it can be established that accessible tourism is a form of tourism that implies respect for the needs of all tourists, regardless of the degree of mobility and cognitive abilities, in a dignified and just manner.

According to the Act on the Croatian Register of Persons with Disabilities (Zakon o hrvatskom registru o osobama s invaliditetom) (NN 64/01) (Official Gazette 64/01), persons with disabilities are persons who have a "permanent limitation, reduction or loss of the ability to perform some physical activity or mental function appropriate for their age, resulting from health impairment" (<https://www.zakon.hr/z/1293/Zakon-o-Hrvatskom-registru-o-osobama-s-invaliditetom>, 03/02/2022). On the basis of the Spatial Planning and Construction Act (Official Gazette 50/12), the Ordinance on Ensuring the Accessibility of buildings for Persons with Disabilities and Reduced Mobility (Official Gazette 78/2013) was adopted. Within the Ordinance (Official Gazette 78/2013), a person with a disability is defined as "a person with permanent or temporary physical, mental, intellectual and/or sensory impairments, which, in interaction with various obstacles in space, may prevent their participation in society on an equal basis" ([https://narodne-novine.nn.hr/clanci/sluzbeni/2013\\_06\\_78\\_1615.html](https://narodne-novine.nn.hr/clanci/sluzbeni/2013_06_78_1615.html), 03/02/2022). People who require special access include people with disabilities, the elderly, people with chronic health problems, people with acute illnesses, and parents with small children (Catela, 2020). Given that according to estimates there are more than two billion people with disabilities, together with their spouses, caregivers, and children at the global level, it is important to make tourism more accessible for everyone. This untapped market faces a number of challenges every day such as: "uneducated professional staff qualified to provide information and advice on accessibility issues, inaccessible booking services and related websites that aggregate services accessible to people with disabilities, lack of accessible airports and transfer facilities and services, unavailability of adapted and accessible hotel rooms, restaurants, shops, toilets and public places, inaccessible streets and transport services, and the lack of available information about facilities, services, equipment rental and tourist attractions suitable for people with disabilities" (<https://www.litto.agency/news-from-tourism-and-guides-for-renters/accessible-tourism-as-a-generator-of-added-value>, 02.03.2022). Further discussion on barriers, challenges and possible solutions is presented in the following chapter.

### **3. CURRENT KNOWLEDGE ON ACCESSIBLE TOURISM**

Accessible tourism is viewed as tourism that creates added value, while people with disabilities are viewed as loyal customers (Nursanty, Anwar, & Mohamadi, 2013). In order for a certain destination to gain loyal customers, it is necessary to see what the preferences of these segments are and how they decide to travel. The research of Stilling Blichfeldt and Nicolaisen (2015) was conducted with the purpose of determining the impact on decision-making on tourism travel among people with disabilities. The research shows that various associations for people with disabilities have a key role in determining whether and how an individual will take on the role of a tourist; that people with disabilities decide to travel in order to be freed from the role of "objects of care", in order to more successfully overcome doubt in themselves and built self-confidence, and that the very process of making a decision about a trip is more complex for them than for other tourists, although this complexity decreases with more frequent travelling and gained experience. As mentioned earlier, there are certain barriers to the development of accessible tourism. In their paper, Stumbo and Pegg (2005) provide an overview of certain barriers in the provision of tourism services to persons with disabilities and propose many solutions for removing barriers in terms of: information and marketing resources, attitudes of staff/workers in tourism, transportation, accommodation, and attractions. As concerns attractions, the authors mention architectural and ecological barriers. For the aforementioned they offer several solutions, but they focus the most attention on the availability of as much information as possible by tourist workers, websites, brochures and the like. Furthermore, based on the conclusion of the Asia-Pacific Conference on Tourism (2000), for persons with disabilities it is stated that for the development of barrier-free tourism it is necessary to do the following: better acquaint stakeholders in tourism with issues of accessibility, based on this,

develop policies that are barrier-free, train employees in tourism, and develop promotional activities. According to research in Tehran conducted by Mahmoudzadeh and Kourdi Sarjaz (2018), three main obstacles to the development of accessible tourism in the environment can be highlighted: transportation, sights and accommodation. Within the category of sights, most respondents believe that the roads to certain sights are not accessible, that there is a lack of parking spaces, a lack of picnic tables, a lack of accessible benches and, among other things, a lack of the presence of educated employees. What is evident from the study conducted by Williams, Rattray and Grimes in 2007 is that the needs of people with disabilities are not met, i.e. that there is a low level of accessibility and little specific internet information necessary for an adequate stay in an accommodation facility. Chikuta (2015) also writes about the insufficient level of development of accessible tourism, stating that tourism and catering in Zimbabwe has not recognized the importance of this tourism segment. According to Jević and Jević (2015), it is necessary to ensure the following elements of accessibility: transport infrastructure (streets, squares, stations, access to means of transport), public facilities, information and communications, services and products. Also, the authors state the importance of the functionality of all elements if significant economic results are to be achieved, but in practice this has not yet been sufficiently recognized. The physical environment, employees in tourism, forms of communication are not sufficiently accessible to people with disabilities. According to WHO, Schmutz (2018) states that if the success of accessibility initiatives is to be achieved, external constraints, competing priorities, availability of technology and knowledge, and cultural differences should be taken into account. Figure 1 presents how the same author explains the process of providing information via websites from the tourist service provider to the user (person with disabilities). The image shows the necessity of educating tourism service providers about the needs of people with disabilities in order to provide them with adequate service using certain technological tools, that is, to provide valid and timely information.



*Figure 1: The process of informing people with disabilities  
(Schmutz, 2018 according to Chisholm and Henry, 2005)*

The English Accessible Tourism Guide for destination managers (Winning more visitors) shows a large use of websites (83%) for information by people with disabilities, while a small number of them (39%) easily access the requested information. This indicates that the websites of destinations are not yet at a satisfactory level of providing information, but they are the most sought-after source of information.

In Croatia, a Handbook was adopted based on the Tourism4all project (2020:2), which, among other things, aims to improve the inclusion of vulnerable groups and their easier access to tourism services. Within the manual, the goal of accessible tourism is stated as "creating an inclusive tourism product, taking care that every guest at the chosen tourist destination feels welcome and that the staff treats them professionally and without discrimination". Furthermore, the most common issues of accessibility that tourist operators encounter are listed, namely: architectural barriers, inaccessibility of websites and unsuitability of menus. For each group of vulnerable persons, it is explained how to behave and what equipment and technical tools to use when approaching the guest.

#### **4. ANALYSIS OF ACCESSIBLE TOURISM IN THE NATIONAL PARKS OF THE REPUBLIC OF CROATIA**

The Republic of Croatia has a total of eight National Parks that are geographically spread throughout Croatia. Whether it is the mountains, the coast or the maritime part of Croatia, National Parks attract tourists every day because of their attractiveness and location. According to the latest data from the Croatian Tourist Board ([https://www.htz.hr/sites/default/files/2021-06/HTZ%20TUB%20HR\\_%202020\\_0.pdf](https://www.htz.hr/sites/default/files/2021-06/HTZ%20TUB%20HR_%202020_0.pdf), 07.07.2022), in 2019 the National Parks together received a total of 3,876,152 visitors, while in 2020 that number was 71.9% lower due to the COVID-19 pandemic. According to the Nature Protection Act (Official Gazette 30/1994), a national park is defined as "a spacious, largely unchanged area of exceptional and multiple natural values, which includes one or more preserved or slightly altered eco-systems." A national park serves scientific, cultural, educational, and recreational purposes. In a national park, activities which do not endanger the originality of nature are allowed. Economic use of natural resources is prohibited in a national park. Tourist and recreational activities must be in the role of visiting and sightseeing, which is allowed to everyone under the same conditions" ([https://narodne-novine.nn.hr/clanci/sluzbeni/1994\\_04\\_30\\_521.html](https://narodne-novine.nn.hr/clanci/sluzbeni/1994_04_30_521.html), 07.07.2022). It is evident from the definition that tourist activities within the National Parks are intended for everyone under the same conditions, therefore, for the purposes of this work, research was conducted with the aim of determining to what extent the activities are adapted to people with disabilities.

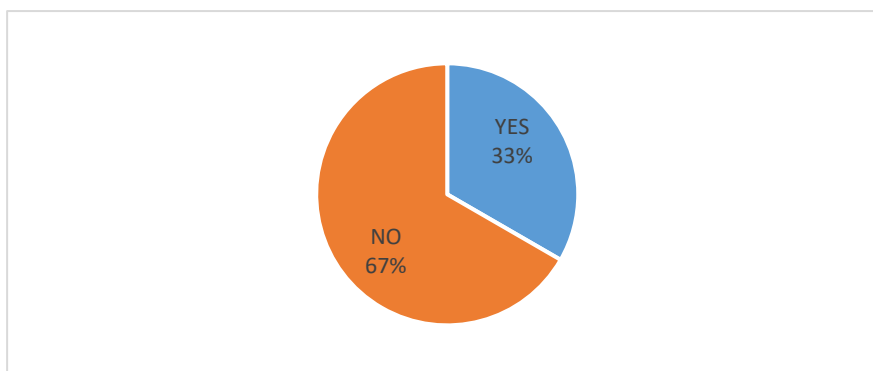
##### **4.1. Methodological framework**

To create an insight into the representation of tools for easier interpretation of tourism content within the National Parks in the Republic of Croatia, research was conducted in the period from March 15 to June 24, 2022. The research tool was an in-depth interview with directors of eight National Parks. A total of six directors participated in the in-depth interview, who were able to present the real state of accessible tourism in the mentioned area through eight questions. The research results are presented with the help of descriptive analysis.

##### **4.2. Research results**

The first question sought to find out more about statistical monitoring of visitors with disabilities, whether it exists (Graph 1), what is the share of that segment and why such monitoring is important for respondents.

*Graph following on the next page*



*Graph 1: Analysis of introduced statistical monitoring in NP  
 (Source: authors)*

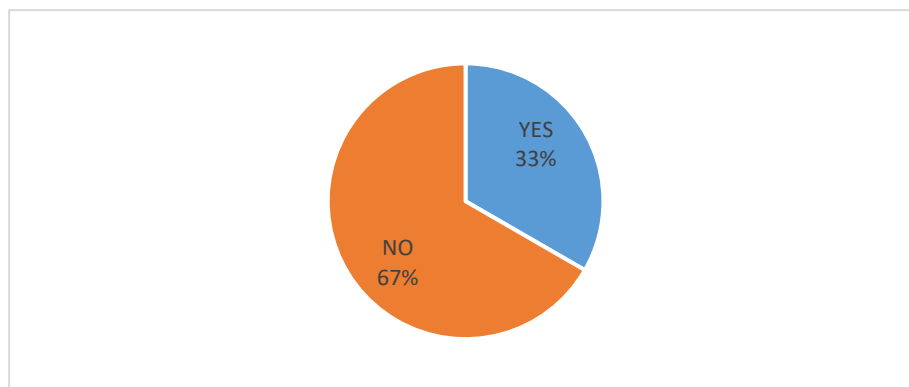
From Graph 1, it is evident that there is usually not conducted statistical monitoring of visitors with disabilities, but through the answers of the directors, it is known that they are moving towards introducing it. Furthermore, 33% of the respondents who said that they have introduced statistical monitoring state that the share is small. One of the reasons why it is important to introduce such monitoring is "because of the input for making plans for the development of reception infrastructure". The next question followed up on the first one with the intention of finding out whether a drop in arrivals of the mentioned segment was noticed during the COVID-19 pandemic, where the respondents answered both YES and NO. Furthermore, through the in-depth interview, it was found out which assistive technology, i.e. aids is represented within the National Park to facilitate access to tourist attractions for visitors with disabilities. An overview of the aids can be seen in Table 2.

DISABILITY AIDS	N	%
Sanitary facilities	4	67
Wheelchair ramp	2	33
Custom websites	2	33
Tactile exhibits	1	17
Tactile lines	1	17
Tactile map	1	17
Elevator	1	17
Information in Braille	1	17
Interpretation boards	1	17
No aids available	1	17

*Table 2: Disability aids represented in NP  
 (Source: authors)*

As can be seen from Table 2, the presence of sanitary facilities for people with disabilities is the most common disability aid, while other aids are represented to a lesser extent. The following question was aimed at finding out more about the organization of websites, i.e., in what way are the websites adapted to the mentioned segment. It can be seen that two respondents (33%) have an edited website, where one of the respondents explained that on the page it is possible to "change the contrast/color of the background and text, increase the letters to the required level and reduce the resolution in order to increase the size of the displayed content". Another respondent stated that the website was adapted for blind and partially sighted people. The respondents expressed their opinion equally on the issue of organizing special tours for the mentioned segment, while the respondents who declared that they have special tours

state that this is possible with prior notice only. Others who stated that they do not have organized tours, state that this is due to the inaccessible terrain. The next question inquired into the education of employees in the segment and the way in which education is carried out. It can be seen from Graph 2 that 67% of the respondents state that there is no education for employees. The other 33% state that education takes place as part of regular education and through attending sign language courses that were realized in cooperation with the Association of Tourist Guides.



*Graph 2: Analysis of the education of employees in the NP on the way to approach the segment*  
(Source: authors)

All respondents agreed that there is room for improvement in their services because they are currently not fully adapted to the segment, while not a single respondent answered respondent could envisage room for such services in the future. The benefits of adapting the content to the segment that the interviewees highlighted were: "equality for all groups", "personal satisfaction of tourists", "education", "creation of a new tourism product", "modern and accessible destination" and "contribution to the community".

## 5. CONCLUSION

The conducted research shows that accessible tourism in the national parks has not yet been established and is only in the process of adapting its contents to people with disabilities. Given that there is almost no statistical monitoring of the mentioned segment in NP, it is difficult to imagine the actual number of people who would require certain assistive technology for an easier interpretation of tourism content. According to the description of the aids represented, it is evident that there is still plenty of room for improving the interpretation of tourism content for this segment, which the respondents are aware of. Given that the population with disabilities is informed predominantly (83%) using web sources, it is disappointing that a small number of respondents have edited websites. This results in poor information of the segment and at the same time in them not deciding to visit the national park. When a population with disabilities decides to travel, it should primarily send a request for organizing a tourist tour, while individual NPs do not even have the option of customizing a tour for that segment. The problem continues in the form of staff education, where it is evident that the staff is almost not at all educated to access the segment. Although the respondents are aware of the fact that there must be progress, none of the respondents indicated where room for such improvement could be found. From previous knowledge and this research, it can be concluded that today's tourism is not ready for this segment. Starting with the education of tourism workers, an adequate foundation could be created for the formation of better-quality tourist content and experiences that are accessible to everyone. Future research directed at studying the necessary education might be recommended.



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## AVAILABILITY AND ECONOMIC FRAMEWORK OF SELECTED SOCIAL SERVICES IN SOLVING THE PROBLEMS OF SENIORS IN THE FIELD OF HOUSING IN THE CONTEXT OF DEMOGRAPHIC AGING

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### **ABSTRACT**

*In the 2021 Green Paper on Aging, the European Commission called for a discussion on the issue of an aging European society, which represents one of the most important challenges having significant impacts on both individuals and society. The Slovak Republic connects demographic development mainly with expenditures on the social and healthcare system, which are experiencing rapid growth. The aging of the population brings about changes in society, therefore it is necessary to respond with systemic changes, and at the same time it is necessary to prepare for the growing pressure on the provision of social services that the aging of the population will cause. The historical context in building the institutional system of providing social services originating from the last century is changing under the influence of the development and focus of European social policy, and the need to provide social services in a natural family environment is highlighted. The development trends also point to not only the growing cost of the services provided, but also to the growing demand for social services. In this contribution, we set ourselves the goal of identifying providers and applicants for the provision of social services in the context of population aging. High facility occupancy indicates that growth in demand is outpacing growth in facility capacity, despite the fact that growth in client numbers is partially dampened by a growth in a healthy life expectancy. Based on the above, in this paper we have outlined the possibilities of solving the unsatisfied demand through alternative forms of housing for Slovak seniors. In conclusion, we present the results of a questionnaire survey with the subjective opinions and preferences of respondents on questions related to housing for seniors in the Slovak Republic.*

**Keywords:** Demographic aging, Seniors, Slovak Republic, Social services

### **1. INTRODUCTION**

The aging of the population can be characterized as a global phenomenon, as the number and proportion of seniors is increasing in almost all countries of the world. It is realistic to expect that in the 21st century it will become one of the most serious problems that will affect many aspects of society's lifestyle. The main reasons for this phenomenon lie in the low level of fertility not reaching the expected rate of reproduction, the decrease in mortality and the entry of a strong aging population into the post-productive age. Everything indicates that this trend will continue and the share of the population aged 65 and over compared to the total population will increase. The share of seniors aged 65 and over in the territory of the Slovak Republic at the beginning of the 1920s of the last century was approximately 5%. By the beginning of the 1960s, their share had risen to 7%. The increase in the proportion of seniors to the 10% mark occurred by the end of the 1980s, and at the end of 2018, the senior component reached 16% of the total population of Slovakia. According to Šproch, Ďurček (2019), 20% of the border could be breached in the second half of the 20s of this century, and even 30% of the border in the 2060s. It is assumed that most of the years of their life expectancy will be accompanied by limitations in the performance of normal daily activities and a dependence on the help of other people - relatives or formal care services (MPSVaR SR, 2021).

Population aging is changing the age structure in favor of the old and to the disadvantage of the young, which is already one of the biggest challenges today that will affect many areas of society, including social services.

Age group	2000	2005	2010	2015	2020	2021
Pre-productive age: 0 – 14 years	19,18	16,59	15,28	15,33	15,90	16,06
Productive age: 15 – 64 years	69,35	71,67	72,34	70,22	67,03	66,55
Post-productive age: 65+ years	11,47	11,74	12,38	14,45	17,07	17,39

*Figure 1: Population structure by main age groups*

*(Source: own processing on the basis of data of the Statistical Office of the Slovak Republic)*

According to Eurostat, Slovakia will be the second fastest aging economy in the EU by 2070, while currently, based on the ratio of the population aged 65+ to the population aged 15-64, we are one of the youngest economies in the European Union.

	2020	2030	2040	2050	2060	2070
Slovak Republic	24,4	32,6	39,1	50,9	59,4	57,0
EU average	31,7	39,1	46,4	50,3	51,6	51,2

*Figure 2: Dependency index, share of population 65+ in comparison to population 15-64 (in %)*

*(Source: own processing on the basis of data of the Institute for Financial Policy, 2021)*

According to Šproch, Ďurček (2019), a continuous extension of life expectancy is expected for persons aged 65, which means that future seniors (men) in 2060 could still have almost 22 years of life ahead of them and senior women more than 24 years of life, but only a small fraction of this aging population can survive part of this period in good health. According to the Statistical Office of the Slovak Republic, the healthy years of life for men over 65 in absolute value were only 4.6 years in 2019 and 4.7 years for women (STATdat, 2022). However, there is the question of the decreasing level of self-sufficiency of the individual and his dependence on long-term social care. The expected demographic development will bring with it many significant changes. The aging of the population can be characterized as a phenomenon that requires increased attention in relation to a number of areas connected with aging. It is necessary to take into account the growing influence of this group on social processes and take its needs and interests into account. Changes in demographic development will also affect health insurance systems in terms of more expensive and more frequent care for the growing number of seniors. Another area that is directly affected by demographic development is the area of social services. It is right to expect that the demand for all types of services, whether institutional, day or outpatient, will grow significantly in the coming years, and therefore attention must be focused on understanding the objective needs of social services. New approaches in population, social and economic policy will be needed to manage the situation. Society should be prepared to deal with the consequences of aging, but our social as well as healthcare system is not sufficiently prepared systemically, financially, organizationally, or personally to deal with its reality. Despite the fact that the aging of the population is considered a natural physiological process that cannot be stopped, it can be prepared for by effective public policies aimed at supporting all age categories in order to ensure dignified and adequate compensation for the deteriorating health of citizens.

## 2. THEORETICAL BACKGROUND

The effects of aging affect many areas of the national economy today. Therefore, as added by Lutz et al. (2008), population aging becomes not only a demographic, but also a social, economic and health topic due to its impacts and consequences.

Aj Mládek and Káčerová (2008) consider demographic development as an event that does not take place in isolation from social development, but is closely connected with geographical, economic, political and social conditions. In recent years, in addition to the professional public, the general lay public, as well as the media and political representatives, have been paying attention to the effects of aging and its spillover into many spheres of society. According to Shaw (2002), the aging of the population will bring about an increasing orientation of the political system towards the needs and interests of the elderly (and therefore a larger number of the electorate). Husáková (2014) states that the state, within the framework of its social policy, decides to what extent and in what forms it directs its aid to target groups. The aging of the population is not only a matter for the Slovak Republic, as evidenced by the World Population Aging report (United Nations, 2015), which states that almost every country in the world is facing an increase in the number of older people in the population. For this reason, the European Union assigns social services a special role in fulfilling development goals and in promoting such basic values as social protection, social cohesion and territorial cohesion. All countries of the European Union deal with issues concerning the development and modernization of social service systems. Social services greatly contribute to securing the basic rights of citizens of the European Union, such as the dignity and integrity of a citizen. Important documents dealing with human rights in the field of social services at the European level are in particular the revised European Social Charter (1996), the Charter of Fundamental Rights of the European Union (2016) as well as the principles of the European Pillar of Social Rights (2017). Relevant recommendations for the field of social services are contained in the European Charter of Rights and Responsibilities of Elderly People Dependent on Long-Term Care (2010) as well as in the Voluntary European Framework for the Quality of Social Services (2010) (MPSVaR SR, 2021). The mission and importance of social services at the national level is declared in the material National priorities for the development of social services for the years 2021-2030, which was prepared by the Ministry of Labor, Social Affairs and Family of the Slovak Republic. The aim is to positively influence the development of social services in the Slovak Republic in a cyclical manner, by defining the policy for the direction of social services at the national level and subsequently formulating the basic priorities of this development and the prerequisites for achieving these priorities (MPSVaR SR, 2021). Quality in the context of the transformation of social services is dealt with by Repková (2016), who examines them from the perception of their providers.

### **3. METHODOLOGY**

The aging of Slovak society is an inevitable phenomenon that Slovak society must prepare for. Prolonging human life is, on the one hand, an achievement of the present age, but it also carries with it some risks in the form of an individual's dependence on the provision of social services. In this context, the aim of this contribution is to identify providers and applicants for the provision of social services in the context of an aging population generating an unsatisfied demand and furthermore to outline possible solutions through alternative forms of housing for Slovak seniors. In order to achieve the goal, we used classic scientific methods, such as the method of comparing knowledge from available literary sources and the method of analyzing existing approaches, extracting common and contradictory opinions. At the same time, we used the deduction method to justify individual conclusions. We used the questionnaire survey method to obtain the opinions of the respondents.

### **4. RESULTS**

Social services as a means of realizing the social rights of a citizen in the sense of the fifth section of the Constitution of the Slovak Republic (Act No. 460/1992) are aimed at alleviating and helping citizens to overcome their social needs and at creating support activities that prevent

any unfavorable social development of citizens. Since 2009, social services have been provided in the Slovak Republic in accordance with Act No. 448/2008 Coll. on social services and on amendments to Act no. 455/1991 Coll. on trade, as amended. The Act on Social Services regulates legal relations and conditions for the provision of social services, the aim of which is to support the social inclusion of citizens and meet the social needs of people living in an unfavorable social situation. Social services help socialization and social inclusion and are a prerequisite for the social cohesion of society.

Factors that underline the necessity to intensively deal with issues related to the development of social services include:

- prolongation of human age, thereby extending the period of life in which a person needs the help of another person,
- the transfer of the standard of life in the productive age to the period when a person is gradually more and more dependent on the help of another person,<sup>1</sup>
- the increasing cost of compensating for a growing dependence on foreign aid.

It should be borne in mind that the population of seniors defined as a post-productive population group is a heterogeneous group with differentiated needs. Each of the age groups of seniors has different needs and demands, which as a priority requires their identification, knowledge of the scope of needs and subsequently the provision of specifically targeted types and measures aimed at ensuring the conditions for a dignified and good quality of life for each individual. With increasing years of aging, there is a certain limitation in daily activities. If health problems are added to the natural changes in the human body with an impact on the limitation of daily activities, it is necessary to provide more expensive and long-term care. The Social Services Act divides social services into several groups, depending on the nature of the adverse social situation or the target group to which they are intended, namely social services for crisis intervention, social services for supporting families with children, services for solving an adverse social situation due to severe disability, adverse health condition or due to retirement age and social services using telecommunication technologies and support services (MPSVaR SR, 2021).

Social services are provided by public and non-public providers:

- ambulatory form, when the recipient of the social service goes to the provider and returns to his natural environment after the service has been provided,
- in the field form, which is provided in the natural environment of the social service recipient,
- in the form of residence, which is provided at the social service provider's premises, as a rule, for an indefinite period of time,
- or in another form (such as telephone assistance).

As of 31 December 2020, the Slovak Republic had 5,517 registered social service providers, of which 711 were providers whose founder was a higher territorial unit and 2,439 were non-public providers. Other providers of social services were municipalities or providers established by the municipality. Social services were provided to more than 55,000 recipients in 1,371 social service facilities. According to the data of the Statistical Office of the Slovak Republic as of 31.12. In 2019, there were 47,202 places in all social service facilities subject to dependency (1,175).

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<sup>1</sup> It is based on statistical data for 2019 because in 2020 and 2021 long-term data from the field of social care are significantly affected by the effects of the COVID-19 pandemic.

Facility type	Number of ZSS as of 31.12. 2019	Number of places as of 31/12/2019		
		Number	of which the care provided	
			residence	ambulatory
Altogether	1 175	47 202	41 059	6 143
of which				
Home of Social Services	276	12 359	10 624	1 735
Facility for seniors	388	19 529	19 401	128
Specialized facility	174	8 099	7 830	269
Nursing service facility	102	2 500	2 475	25
Day care center	168	3 420	23	3 397
Supported housing facility	40	657	657	0
Rehabilitation center	27	638	49	589

Figure 3: Number of social service facilities with number of places as of 31/12/2019  
 (Source: MPSVaR SR, MZ SR, 2021)

From the total number of clients of social service facilities subject to dependency as of 31.12. 2020 (45,303) represented 68% of persons of retirement age.

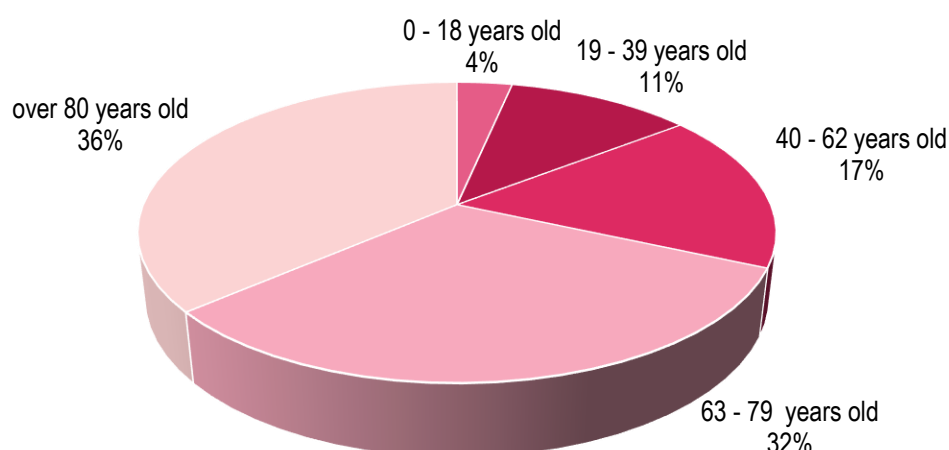


Figure 4: Age structure of recipients of social services in facilities conditioned by dependence on the help of another person

(Source: Selected data of the Statistical Office - Social Services Institutions in the Slovak Republic)

The total number of applicants for the provision of social services in institutions subject to dependency increased by 339 persons compared to 2019 and reached the level of 11,118 persons.

Year	2016	2017	2018	2019	2020
Number of applicants	7 699	9 586	9 643	10 779	11 118

Figure 5: The total number of applicants for the provision of social services in facilities conditioned by dependence on the help of another person  
 (Source: MPSVaR SRa, 2021)

The financing of social services dependent on dependency is multi-sourced. It is mainly made up of the budgets of the founders of the facilities, i.e. local and regional self-government.

Furthermore, from the state budget through the chapter of the Ministry of Labor, Social Affairs and Family of the Slovak Republic, which provides general and non-public providers of selected types of social services with a financial contribution. Last but not least, the recipients of social services participate in the payment. The recipient is obliged to pay the payment for the provided social service, while the Act on Social Services explicitly stipulates the minimum balance of funds after payment for the social service. The total amount of costs per person per month in a year-round residential facility of social services ranges from €1,000 to €1,300<sup>2</sup> on average, depending on the type of facility, which is even after deducting the disability/old age pension<sup>3</sup>, which is more than the amount of cash allowance for caregiving and payments for the services of home nursing care agencies, provided to dependent persons in the home environment (MPSVaR SR, MZ SR, 2021). Despite the high costs of this type of social service provided, the Slovak Republic shows their inadequacy, which will continue to grow due to the expected demographic development. According to the projection of the Slovak population until the year 2200 (Vaňo, 2015), a dramatic increase in the population aged 65 and over is expected by more than 90% by 2065, which will cause a change in the proportion of age groups to the values of 20% (children and youth), 50% (productive age) and 30% (seniors). Currently, the share of people in the post-productive age reaches the level of 17.39% (STATdat, 2022). On the basis of demographic changes, it is possible to assume an increase in the demand for social services in facilities dependent on the help of another person, which will put pressure on financial costs from public sources. The Slovak Republic is trying to respond to this fact by supporting the process of deinstitutionalization of social services, which, however, is significantly slow due to procedural and financial obstacles. Despite the fact that in 2014 the creation of large-capacity facilities was legislatively limited, there was no adequate development of community services. The process of deinstitutionalization opens up space for increasing the quality of provided social services as well as creating jobs. Despite the efforts made, it was not possible to completely complete the deinstitutionalization process, and for that reason, the transition from institutional to community care was also reflected in the priorities for the development of social services for the years 2021-2030. At the same time, some social services, especially long-term care, need to be explicitly defined by law, including their funding sources.

National priorities for the development of social services for 2021-2030 (MPSVaR SR, 2021):

- Transition from institutional to community care and support with the aim of ensuring the availability of diverse social services of a community nature in accordance with the needs of target groups of social services.
- Introduction of a system of integrated social and health care.
- Support for connecting social services and informal (especially family) care as part of the system of care for persons dependent on the help of another physical person.
- Support for improving the quality of social services.

The aim of the elderly-oriented policy is to increase the self-sufficiency and independence of the elderly, with the intention that as many elderly citizens as possible can remain in the natural environment of their own household. In this context, it is necessary to ensure the complementarity of care segments (e.g. family, community, formal and informal services, etc.) The alternative of changing housing at retirement age is also documented by a questionnaire survey on a sample of 497 respondents (82.1% women and 17.9% men) carried out between February and March 2021. 58.6% of respondents prefer the option of staying in their property due to knowledge of the environment where they live.

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<sup>2</sup> These are average values of economically eligible costs for 2019 based on data provided by self-governing regions.

<sup>3</sup> The average amount of old-age pension as of 31.12.2020 was €487.<sup>37</sup>.



24.1% of respondents prefer being close to family and for that reason would be willing to move to a place that provides them with social contact. 9.3% of the respondents prefer the proximity of services and would therefore be willing to move closer to the center in order to have the necessary services close to their residence. 5.2% are willing to move to a facility that will provide them with the regular care they inevitably need due to their age and health. The remaining respondents did not state their opinion. The questionnaire survey further revealed that up to 51% of respondents would not go to the facility. They cited loss of privacy, a reduced sense of security and an insufficient number of professional staff as the main reasons. At the same time, they stated that they would reconsider their decision only if their health condition was so serious that there was no other option. Improving the quality of social services is a tool for increasing the safety and stability of provided social services, and for that reason the Slovak Republic has set the quality of social services as a national priority. The high preference of the respondents desire to stay in their property and the low willingness to move to the facility opens up possibilities for alternative forms of housing and care for the older generation. In the future, alternative forms of housing could fill a gap in the market and become a fixed part of the housing offer for seniors. As other alternative forms of housing for seniors, in addition to cohousing, various forms of housing outside buildings are offered, such as boathousing, shared housing with other people, multi-generational housing, housing in facilities near university campuses, senior parks, senior villages, assisted living and others. Some examples are more applicable in practice, others less so, depending on factors such as the residents' financial capabilities, health status, culture, social environment and family influence. Cohousing is among options with a long tradition, it has taken hold on the market, it is not experimental housing, it offers solid housing facilities for seniors, it has gained popularity among seniors, especially in Western countries, and it has the potential to take root in Slovakia if the system is properly set up (Sika, Vidová, Girašek, 2022). A typical cohousing concept is usually located on the outskirts of a large city and is inhabited by 6-36 households with residents of different ages, where each household has its own or rented property that is fully furnished. The uniqueness is the common community space that is used by all cohousing participants. It is a way of living that combines the autonomy of private homes with the advantages of shared spaces, neighborhood life. Housing of this type should contribute to the development of social relations between individuals who know and trust each other, which creates a feeling of security and safety, and who will help each other, thus decreasing the interest in using external social services. On the territory of the Slovak Republic, we still do not register any integrated project that we could call cohousing. We can find the closest one with our neighbors in Austria, who offer us instructions on how to create such a form of housing, what it should contain and how it is requested (ETX Studio, 2020). An alternative to cohousing is a community home for seniors, it is an apartment building that consists of apartments and shared spaces, while it consists of a minimum of 10 social apartments and a maximum of 25 apartments intended only for people over 60 years of age who are self-sufficient and independent. In case of reduced self-sufficiency, help is provided by family or neighbors, which is an advantage, as it is community housing with shared assistance. Senior villages are similar to cohousing, so it is appropriate to characterize in particular the trend that attracts seniors to the rural environment. Senior villages are built on the basis of building a community with the provision of social services and practical assistance with regard to dependence on the given assistance. Residents of the communities exercise self-governance over their community, create their own administrative bodies, and create innovative partnerships. Innovative forms of housing exist in a wide spectrum according to the focus, target group and purposes they are supposed to fulfill. First of all, the interest and needs of seniors should be taken into account. They are expected to be open to new solutions and to be able to get out of the usual patterns of running a household and private life. A wide range of housing can easily collapse due to a reluctance to cope with a change in lifestyle.

However, first the offer itself must be appropriately prepared, financially accessible, taking into account the expectations of seniors, their health status, social relations and a whole range of factors, the exact definition and quantification of which is difficult to determine in practice, because each individual has his own expectations and specific needs. (Sika, Vidová, Girašek, 2022)

## 5. CONCLUSION

An aging population is the most significant change in society that is sure to come, and it will manifest itself in dramatic yet predictable ways. When preparing for its long-term intentions, society should not ignore this fact and should include aging policy in its priorities. Due to an increased aging population, the area of social services is becoming an important priority for further development. These developments will be provided in the context of low fertility, the increasing economic burden on the productive population and the rapid increase in the amount of people over 65, who will create demand for social services. In the period from 2013 to 2019, there was an increase in the number of people waiting for services in social service facilities, which show an occupancy rate of more than 90%, which means that the growth in demand exceeds the growth in the capacities of the facilities. Part of the creation of sufficient capacities for the provision of services is the support of all forms of complex care, the building of sufficient personnel capacities and their financial security. It is necessary to realize that even society will function differently due to aging. The prevalence of residential forms of care negatively affects the availability and efficiency of care and at the same time moves clients far from their community, which creates a negative attitude towards institutional social services. Growing expenditures on the social system will cause the need to reevaluate these systems, as social services are decentralized and the financing system is extremely complicated. Without a fundamental increase in the volume of funds for the financing of services, it is impossible to expect either an increase in their availability or an improvement in their quality. The change in financing must be based, for example, on the introduction of mandatory long-term dependency insurance, which will turn a passive recipient into an active contributor who will prepare for their long-term dependency during an economically active life. At the same time, it is necessary to financially support services that are provided in the natural home environment of the recipients. However, residential care should only be used if care cannot be provided in the home environment.

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## VICIOUS PRACTICES OF THE COMMISSION OF ACADEMIC ETHICS IN BULGARIA

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### ABSTRACT

*In Bulgaria, a legal commission on academic ethics has been operating since recently; it is a subsidiary body to the Minister of Education and Science. The regulations of this special body are structured through the Law of Academic Staff Development of the Republic of Bulgaria. Its functions are related to the implementation of certain control of the procedures for obtaining of the educational and scientific Doctor degree and the scientific Doctor of Science degree, as well as for academic positions in Bulgarian universities. In the past, the most frequently considered cases have been related to incrimination in plagiarism and filing a special report to the Minister of Education and Science. A priori, the question arises as to how to structure this Academic Ethics Committee, which is determined by order of the Minister of Education and Science. In the practice of forming the membership of such committee, the selection criteria, which must be high enough to be able to guarantee a certain impartiality, are not clear. These are not defined either in the Law for academic staff development of the Republic of Bulgaria and the regulations for its application or in other public normative document. Determining the membership of this kind of national specialized body is of particular importance both for its functioning as well as the competences of its members. Those are currently in active employment relationships with certain universities or research organizations, which predetermines their direct dependence on their managers, who are at the same time their employers. Last but not least, it is worth mentioning the direct connection between the Minister of Education and Science and the heads of higher education institutions in Bulgaria, who have contractual relations of special type of management contracts. These direct and indirect relations create preconditions for dependence of this specialized body - the Academic Ethics Committee. This study attempts to provide a legal and ethical response to the actions of the Academic Ethics Committee at the Bulgarian Ministry of Education and Science.*  
**Keywords:** Academic ethics committee, functioning, legal framework

### 1. INTRODUCTION

Academic ethics is a concept that describes the behaviour of a scientist or researcher not only in the academic community but in the society in general. Academic norms are not defined in quite a specific way and bear the marks of moral behaviour in all aspects of this concept. To what extent and how these norms can be determined in an indisputable way could be a subject of a separate discussion and a way of determining public relations in this direction. In Bulgaria, a legal committee on academic ethics has been operating since recently; it is a subsidiary body to the Minister of Education and Science. The regulations of this special body are structured through the Law of Academic Staff Development of the Republic of Bulgaria. Its functions are related to the implementation of certain control of the procedures for obtaining of the educational and scientific Doctor degree and the scientific Doctor of Science degree, as well as for academic positions in Bulgarian universities. In the practice so far, the most frequently considered cases have been related to incrimination in plagiarism and filing a special report to the Minister of Education and Science. A priori, the question arises as to how to structure this Academic Ethics Committee, which is determined by order of the Minister of Education and Science. In the practice of forming the membership of such committee, the selection criteria, which must be high enough to be able to guarantee a certain impartiality, are not clear.

These are not defined either in the Law for academic staff development of the Republic of Bulgaria and the regulations for its application or in another public normative document. Determining the membership of this kind of national specialized body is of particular importance both for its functioning as well as the competences of its members. Those are currently in active employment relationships with certain universities or research organizations, which predetermines their direct dependence on their managers, who are also their employers. Last but not least, it is worth mentioning the direct connection between the Minister of Education and Science and the heads of higher education institutions in Bulgaria, who have contractual relations of special type of management contracts. These direct and indirect relations create preconditions for dependence of this specialized body - the Academic Ethics Committee. Most generally, plagiarism is defined as follows: Plagiarism is a claim to authorship of a work that has been actually created by someone else. Although it may not always be related to copyright infringement, plagiarism is generally considered reprehensible. From Latin, the term "plagiarism" means the authorship claim to articles, works, books, etc., which, in fact, have been already created by another author. Thus, plagiarism publishes someone else's work or part of it under one's own name. Thus, the plagiary starts to gain undeserved benefits. In most countries, plagiarism is punishable by law. The current Penal Code of Bulgaria (Art. 173, para. 1) (2022a) declares plagiarism a crime, defining it as follows: publishing or using under own name or pseudonym somebody else's work of science, literature and art or a significant part of such work. This specialized body in Bulgaria considers such cases and it is this committee's task to appoint three experts, who in the internal organizational documents are called arbitrators. The procedure for the selection of these arbitrators is not public and raises certain doubts about their selection and expertise. Generally, they should be from the same professional field and not only; they should also have proven high competencies related to the examination of the specific dissertation or the respective procedure for holding an academic position. The lack of any rules calls into question the actions or inactions of the selection of arbitrators, drafting of quality opinions and the possibility for them to be objectified enough.

## **2. LEGAL ASPECT OF ACTION PROCEDURE OF THE ACADEMIC ETHICS COMMITTEE UNDER THE MINISTER OF EDUCATION AND SCIENCE**

The proceedings under Article 35 of the Law on the Development of Academic Staff in the Republic of Bulgaria should be developed before the competent body, namely - the rector of the respective higher school, and not the Minister of Science and Higher Education. In this case, the Minister has misappropriated this function, which the legal hiatus of the law has provided, but rather his function is only advisory and does not give rise to legal action. The relevant hypothesis in this case is that of para.1, item 1 – following the established order, it is necessary and sufficient to prove plagiarism in scientific papers, on the basis of which the person has participated in a procedure for acquiring a scientific degree and has acquired one. In this case, this proof was made after the inspection of a body with special competence, being firstly duly referred - the Academic Ethics Committee at the Ministry of Education and Science. The referral for inspection is clearly laid out in paragraph 4c of the additional provisions of the Law on the Academic Staff Development in the Republic of Bulgaria, according to which signals for plagiarism and/or unreliability of the submitted scientific data in relation to completed procedures for acquiring scientific titles and holding of academic positions under this law, as well as acquisition of scientific degrees and scientific titles by the order of the repealed scientific degrees and scientific titles Law, shall be considered and checked by the Academic Ethics Committee according to Art. 30, para. 5 - 12 of the Law on the Academic Staff Development in the Republic of Bulgaria. Two steps on the verification of the received report have been made - the first one concerns its admissibility, the second - in essence, concerns the validity of the stated allegations (Art. 30, para. 5 of the Law on the Academic Staff

Development in the Republic of Bulgaria). The decisions regarding the first step are made by a three-member committee appointed by the Minister of Education and Science (Art. 30, para. 4 of the Law on Education and Science); a qualified lawyer should also be a part of this committee. After assessing the admissibility of the report, according to Article 30, paragraph 6 of the Act, the Academic Ethics Committee is assigned to perform the inspection under paragraph 4, item 2. The content of the latter, as well as the explicit text of Art. 30, para. 12 (both imperative) indicate that a full and comprehensive inspection is due, for which the Committee shall file a report in written to the Minister of Education and Science. The content of the report is laid out in detail in Article 30, paragraph 9 of the Law, and the algorithm of proceeding in paragraph 8 to paragraph 11, which are have not been precisely observed. The initiation of the special proceedings under Art. 35, para 2 and para 3, in connection with para 1 of the same norm, is bound only by the presence of the prerequisite referred to by the legislator - plagiarism in scientific papers on the basis of which the person has acquired or participated in a procedure for obtaining a scientific degree, proven by the statutory order (as described in detail above). The provisions of Art. 35, para. 1, item 1 and Art. 35, para. 2 and 3 of the Law on the Academic Staff Development in the Republic of Bulgaria, indicated as a legal basis for the issuance of the relevant administrative act of the rector of the higher school, read: Art. 35, para. 1, item 1 of the Law on the Protection of the Rights and Freedoms of Persons with Disabilities: has held or participated in a competition for an academic position. Art. 35, para. 2: In the cases of para. 1, item 1 the scientific degree, acquired by the order of this law with, which the violation is connected should be taken away as well. Art. 35, para 3: The revocation of a scientific degree and the dismissal shall be carried out by the rector of the higher school by the order of the Higher Education Act and the regulations of the higher education enterprise, respectively - by the head of the scientific organization in accordance with the regulations of the respective organization. According to Art. 2, para. 1 of the Law on the Academic Staff Development in the Republic of Bulgaria, the academic staff includes the persons holding academic positions in the higher schools and the scientific organizations, as well as other persons, determined in the Higher Education Act, and according to para 3 of art. 2, the academic positions are: assistant, chief assistant, associate professor and professor. The provision of Article 48 of the Higher Education Act specifies the positions of research and teaching staff of higher education institutions: for habilitated lecturers - associate professor and professor, for non-habilitated lecturers - assistant and chief assistant; lecturer and senior lecturer; the latter are the positions of non-habilitated persons, who are assigned only teaching activities to non-specialists in linguistics, sports, art, etc. All of the above indicates that the members of the academic staff of a higher education institution are assistant, chief assistant, associate professor, professor, lecturer and senior lecturer. The analysis of the provision of Art. 35, para.1 of the Law on the Academic Staff Development in the Republic of Bulgaria points out that it explicitly regulates the cases in which a person is dismissed from their academic position, one of which is duly established plagiarism. In this case, the rector of the higher school in their condition of bound competence, in the absence of discretion, dismisses the person from the academic position (in respect of which plagiarism has been established), when that person had participated in the procedure for obtaining a scientific degree. Simultaneously with the dismissal from academic position, the scientific degree obtained under this law, to which the violation is related, shall be revoked. According to Article 35, para. 2, in conjunction with Art. 35, para 1, item 1 of the Law on the Academic Staff Development in the Republic of Bulgaria, the dispositional actions of the rector of the higher school are in relation to a person holding an academic position in the respective higher school, as the act of the competent body has two operative functions: dismissal from academic position and revocation of the scientific degree. By argument to the contrary, since the legislator explicitly states that the revocation of the scientific degree is "in the cases of para. 1, item 1", "plagiarism done by a person holding

academic position" should be undoubtedly proved in accordance with the established procedure, according to which that respective person should be dismissed from this position, i.e., all ordered actions are addressed to persons holding academic positions. The inevitable conclusion arises that the competent body of one such procedure is the respective rector of the higher school, and not the Minister of Education and Science even more so a particular subsidiary body. Objective circumstances, outside the legal aspects. An analysis of the committee's activity gives rise to a number of important questions, namely: How does the Academic Ethics Committee violate non-existent legal doctrines? Or why do people who are entrusted with drafting opinions turn out not to know or implement the necessary regulations? Here, too, questions arise about accusations of auto plagiarism. For those who have been making such accusations for many years, I would like to clarify - the term "auto plagiarism" exists outside the Bulgarian legal framework. A person can be accused of non-compliance with a law, regulation, ordinance, but to be accused of something that is not introduced into law, such as the term "auto plagiarism", is in itself far from legal and scientific norms and standards. There are various hypotheses for the introduction of this term. The last one I know is on behalf of the Bulgarian Chamber of Commerce. It is presented at the following link: <https://www.bia-bg.com/standpoint/view/28961/> (2022b). My question here concerns much deeper aspects than the direct accusation of plagiarism, rather it concerns the competence of the people who are tasked with drafting opinions on plagiarism. It is common knowledge that proposal for a change in a law is not enforced until it is voted on and officially adopted. Just as the occasional creeping proposals for the return of the death penalty in Bulgaria do not automatically make it a valid punitive measure in our country. In order not to be outdone, I will quote a scientific article by Prof. Robert George Cooper (a verbatim quote from the article) - a distinguished research associate at Penn State University; Honorary Professor at McMaster University, Canada. Finding out that I had quoted his publication, Prof. Cooper, whom I do not know personally, sent me his latest article on the same subject so that I could use it in my future work. What immediately strikes is that:

- The completely new part, the one that is different from the previous article, is within two paragraphs. Everything else repeats the previous post;
- More than half of the sources in the presented bibliography are the works of Prof. Cooper himself;
- No one accuses Prof. Cooper of auto plagiarism, plagiarism of copyright and co-authored works and "imported" texts by co-authors.

### **3. DETERMINING THE SO-CALLED "GOOD PRACTICES" BY THE ACADEMIC ETHICS COMMITTEE**

#### **3.1. Since when has "good practice" been mandatory in Bulgarian legislation?**

I allow myself to summarize in one question the many statements of the members of the Bulgarian Academic Ethics Committee, because, in practice, they are based on "good practice" and cover allegations of inaccuracies in citations and plagiarism of authorial and co-authored works. We must specify that the citations in the scientific papers are firstly made, according to the established requirements of the respective higher schools, and secondly - according to the current standard for citation, namely: BDS 17377: 1996. When published in various scientific journals, their editorial policy determines the method of citation, as well as other technical requirements. Arbitrators' opinions often show ignorance of rules and norms, including the use of indirect citation as "presentation of multiple publications and authors whose cited publications do not address the cited thesis." Indirect citation or the so-called paraphrasing, allows retelling a quote or presenting information in your own words. This type of citation summarizes information with reference to several sources and is used to summarize a voluminous theoretical concept, procedure or research results, voluminous citations not



applicable to the entire text, as well as foreign language source citations when the author is not fully convinced of his own translation - activities typical of any dissertation research paper. Paraphrasing helps the author to present in detail the sources used and to indirectly convey the scientific theses developed. According to Brenda Spatt (See Brenda Spatt, *Writing From Sources*, 8th ed. Bedford / St. Martin's, 2011 <https://archive.org/details/writingfromsources/page/n579/mode/2up>) (Spatt, 2011), there are two main reasons for using periphrasis, namely: to present indirect information or evidence when there is no specific reason to use direct citation or to present to the audience an accurate and comprehensive account of ideas taken from sources that the author explains, interprets or disagrees with and disputes. Scanning your and other scholarly publications, especially in social sciences, I find that indirect citation is a common practice and is not considered plagiarism. The indirect citation is also explained in an article published on the website of the Institute for Economic Research at the Bulgarian Academy of Sciences, as can be seen from the following two links: links: <https://www.iki.bas.bg/>, (2022c); <https://www.iki.bas.bg/files/Nauchnoto%20citirane.pdf>, (2022d). As to connect the statement with the above question - here the good practice is rejected by the members of the Bulgarian Academic Ethics Committee as irrelevant. I would be far more inclined to accept this statement if this same committee wouldn't not make it mandatory in the next indictment to draw up division protocols, although the legislation does not require them as per the relevant procedures. Various reports from the Academic Ethics Committee state that: "The provision of division protocols in such cases is a traditional academic practice imposed long before the latest amendments to the Law on the Academic Staff Development in the Republic of Bulgaria". "Good practice" does not have binding nature and is not a reason for subsequent restrictive and punitive measures against anyone, even when it is not available in a specific procedure. Only laws and rules explicitly written and approved by the respective administrative order may be obligatory. In general - the application of the current legal framework to past actions I would equate to the Revival process in Bulgaria (then - the People's Republic of Bulgaria) and the time when the names of deceased people were forcibly changed. An act deeply unethical and immoral. And again I will allow myself to give an example with a publication of the current Minister of Education and Science Nikolai Denkov. It is about "Dynamics of Particles on Interfaces and in Thin Liquid Films", published in "Encyclopaedia of Surface and Colloid Science" - something that according to the current Regulations for the implementation of the Law on Academic Staff Development in the Republic of Bulgaria is unacceptable. If we follow the logic of the members of the Committee, what does it matter when it is been published - in relation to the current legislation, this is a violation. Have the members of the Bulgarian Academic Ethics Committee wondered what would be the result of an alleged check for the availability of division protocols of all dissertations submitted in Bulgaria? Therefore, an interesting example in this direction would be the publications of Nikolay Denkov (<https://ras.nacid.bg/dissertation-preview/3765>) (2022e) and, in this case, what exactly the division protocols will look like:

- "Direct Measurement of Lateral Capillary Forces" by: Orlin D. VeleV, Nikolai D. Denkov, Vesselin N. Paunov, Peter A. Kralchevsky, and Kuniaki Nagayamaj (<https://pubs.acs.org/doi/10.1021/la00036a056>);
- "Formation of Two-dimensional Structures from Colloidal Particles on Fluorinated Oil Substrate" with authors: Genady S. Lazarov, Nikolai D. Denkov, Orlin D. VeleV and Peter A. Kralchevsky (<https://pubs.rsc.org/en/content/articlelanding/1994/ft9949002077>);
- "Charging of Oil-Water Interfaces Due to Spontaneous Adsorption of Hydroxyl Ions" by K. G. Marinova, R. G. Alargova, N. D. Denkov, O. D. VeleV, D. N. Petsev, I. B. Ivanov, and R. P. Borwankar (<https://pubs.acs.org/doi/10.1021/la950928i>).

Can a division protocol be provided for each of the joint publications and what is the percentage of the scientific contribution of each of the authors? Who exactly is the author of a table, graph or specific conclusion, so that the next time it is used it could be cited - all these are entities for which there is no way to create division protocols? Or should we, by analogy, question the authorship of one of the co-authors in these publications and accuse him of plagiarism? And what is the contribution of a certain co-author in a particular publication, when it is in last place. Or, if I may borrow an expression from the Bulgarian Academic Ethics Committee – “good practice” is considered to single out as leading author the one whose contribution is the biggest and, accordingly, his name comes first. This statement may not always be objective, but in most cases the lead author is the first author in a particular scientific publication. I personally defend the thesis that your work in a team not only gives better results but also allow for more successful dissemination. However, the question remains open - if there is no division protocol, how is it determined whether author A copied from B or vice versa? Relevant conclusions are observed in the opinions of a number of arbitrators, namely - in general publications the specific authorship cannot be traced and set. What these conclusions are based on is something one cannot find stipulated in writing and there is no way to be done so. One more thing - accusing someone of plagiarism, does that mean that their Bulgarian and foreign co-authors plagiarized as well?

#### **4. CONCLUSION**

Collaboration with colleagues in research and dissemination of results in publications should not be considered a vicious practice, but encouraged instead. The Bulgarian Academic Ethics Committee bases its opinions on good practice yet, is it possible to provide a list of good practices that are mandatory, those that are recommended and others that are prohibited? All this summed up gives reasonable assumptions for bias and compromising the work of this specialized body under the Minister of Education and Science. As plagiarism, the Committee points out to definitions which are in fact approximately or completely identical in different sources. Scientific definitions and terminology in most cases cannot be assigned to one author, which leads to the impossibility of naming one. The same applies to appendixes, figures and tables created within the framework of the research conducted by any scientist - it turns out it is necessary to explicitly state that these were created by the author himself. Every scientist uses their own developments and applications many times, without mentioning oneself as the author, which certainly does not make the latter a plagiarist. An interesting fact from the present analysis shows that the same arbitrator has prepared more than one standpoint on the procedures of the same scientist, which makes the procedure flawed and biased - at least because he has already formed an opinion in one of those standpoints. The lack of consistency in the standpoints prepared, the selective presentation of evidence based on good practices on one hand and their non-acceptance on the other hand, inevitably leads to the following questions, which concern the objectivity of the procedure. The lack of clear rules and criteria for the selection of arbitrators raises difficult questions related to the assessment's objectivity of both the arbitrators and the entire committee. Thus, in determining what plagiarism is, can you answer the question - were the arbitrators reviewers and how well do they know the whole process? Do they have, and if so - how many, publications in the reference systems of Web of Science and Scopus? The same question, with no less intensity, applies to the authors of the standpoints - what their publishing activity is, if any. And this puts on the agenda the question of how the standpoints were taken - by competence or under someone's pressure. It is the publication of articles referenced to in world scientific databases as Web of Science, Scopus, Springer, etc., that is an objective proof of the lack of plagiarism in the works of their authors.

Therefore, my last question is: if, based on the conclusions and decisions made by the Academic Ethics Committee, it is claimed that the scientific community can thus be deceived, who will dare, not in theory but in practice and with the respective legal responsibility and consequences, to question the qualities of the examiners in these referenced publications? Scientific articles, independently written or in co-authorship with scientists from different countries, reflect, analyse or study social processes. Forgive my question but how can the division of a social process description in a scientific article, report or study be defined? Not only is this practically impossible, but it cannot even assess the intellectual contribution of the scientist concerned, which can amount to only 5% of the text and still give high scientific value.

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# TOP SOCIAL MEDIA IMPACTS: DOES POPULAR TWITTER POSTS AFFECT BITCOIN RETURN

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## ABSTRACT

*Bitcoin, the first decentralized digital currency, represents a completely new economic market. Its emergence has become a central discussion among investors and economists; It has the potential to cause waves in future economic behaviors. Following the Bitcoin Trading tendency and revolution, this study examines the dynamic relationship between social media effects and bitcoin returns. The study uses log regression on Stata as the main method to display the analytic model. We gathered the top Twitter post by celebrities and distinguished the effect of the post into three different categories: neutral, positive, and negative. On the other hand, the study collected Bitcoin price and trading volume according to the Twitter post time. The same data set on price and volume are collected 4 hours and 24 hours after each Twitter post. The study found a correlation between positive tweets and bitcoin trading volume 4 hours later and between neutral tweets and volume 24 hours later. However, the study has not found any evidence of the relationship between the price and celebrities' tweets. Overall, my findings reveal that celebrities' tweets may indicate potential changes in Bitcoin's trading volumes but lack the evidence to show its effects on Bitcoin's price. This paper offers a partial study on the economic impact of social media.*

**Keywords:** *Celebrities' tweet, Bitcoin Price, Bitcoin Volume*

## 1. INTRODUCTION

After the price of cryptocurrencies started to skyrocket in late 2020 and early 2021, many celebrities—including Kim Kardashian West, Matt Damon, and Tom Brady, to name a few—promoted the digital currencies online (Nover, 2022). Prices fell precipitously in late 2021 into mid-2022, prompting a host of lawsuits against celebrities who had pushed cryptocurrencies (Smith, 2022). In this paper, I explore whether celebrities' promotion of Bitcoin (the first and most popular cryptocurrency) on the Twitter platform actually caused prices to move. Since the 2008 invention of Bitcoin (BTC) by an unidentified programmer known as Satoshi Nakamoto, virtual currency has become increasingly popular among investors. BTC, once worth just pennies, reached an all-time high of over \$68,000 in November 2021, having started the year at just under \$30,000. However, the price has since fallen quickly, dropping below \$20,000 by June 2022. Unlike government-backed currencies, there is a fixed supply of BTC, which subjects the currency to large price swings as demand changes. Furthermore, this demand is driven largely by speculation rather than by demand for liquidity (citation). Hence, we hypothesize that celebrity social media posts could have a meaningful impact on BTC prices. In this paper, I analyze whether widely-viewed Twitter posts about BTC (with at least 10,000 likes) from online influencers (those with at least 100,000 followers) have an impact on BTC prices in the short run. I find these tweets have little effect on BTC prices or trading volumes in the short run (4 to 24 hours after the tweet was posted).

## 2. LITERATURE REVIEW

Bitcoin's software leverages a decentralized network to make peer-to-peer transactions. This functionality allows it to act as a base monetary layer for a new financial system (Yakes, 2021). Due to its decentralized nature, it is plausible that "the dynamics of the bitcoin price thus should relate to pertinent discussions and opinions on online social media, where investors and

business adopters interact and provide feedback about the market” ((Mai et al., 2015). In other words, the patterns of BTC prices may be more similar to stocks instead of a currency. A research paper that studies the relationship between S&P 500 price return and Twitter posts done by Sul, Dennis, and Yuan showed that the cumulative emotional valence (positive or negative) of Twitter tweets about a specific firm was significantly related to that firm’s stock returns (Dennis et al., 2014). The team used the closing price of each stock in the S&P 500 between March 2011 to February 2012 and 3,475,428 Tweets that contained the “\$” symbol in the same period. The team concludes that postings from users with many followers have a greater impact on same-day returns, while postings from users with few followers have a greater impact on returns further out.

In their paper, **From Bitcoin to Big Coin: The Impacts of Social Media on Bitcoin Performance** (Mai et al., 2015), the team have provided empirical evidence of social media’s impacts on future bitcoin returns. They concluded that social media offers substantial information about bitcoin’s acceptance among the general public and daily fluctuations in its market. The research team suggests that the “follow-the-influencer behavior exists in the bitcoin market by finding a significant relationship between influencers’ tweets and bitcoin price return.” Based on the result of the research, the team proposes that social media is an indicator of future bitcoin prices. Additionally, a study was done by Peng, Urquhart, and Wang to determine the relationship between the number of tweets on Twitter referring to Bitcoin and whether they are useful in forecasting future realized volatility (RV), volume, or returns. They found that in the period between September 2014 and October 2017, tweets are associated with changes in BTC trading volume. However, in the period from October 9 2017, to August 31, 2018, they found a significant effect on both RV and volume. In conclusion, the studies show that the number of previous day tweets is a significant driver of Bitcoin RV and volume but was not a significant predictor of BTC returns (Shen, Urquhart and Wang, 2019).

However, Guegan and Renault's paper **Does investor sentiment on social media provide robust information for Bitcoin returns predictability?** (Guégan and Renault, 2020) concludes that for high frequencies up to 15 minutes, the sentiment of messages sent on StockTwits about Bitcoin has a statistically significant and positive effect on return in the following period but “did not find any significant relationship consistent with previous results on the literature (past information published on social media) on the efficiency of the market on a daily frequency”. The team used two types of data: 1. trade data to compute intraday BTC–USD returns; 2. StockTwits data to measure investor sentiment and investor attention. By presenting the results for two sample periods (bubble, August 2017 - April 2018, and post-bubble, May 2018 - December 2019), the team concludes that it is difficult and almost impossible to generate abnormal profits by trading on the information derived from the social media data used in the study. Based on the above research results, the overall relationship between social media posts and bitcoin return remains unclear. I wish to narrow down the targeted range of tweets to the top tweets by influential accounts on Twitter to study if celebrity tweets have an influence on BTC price and trading volume.

### 3. DATA AND METHODS

#### 3.1. Data

Twitter data: Using a python program accessing Twitter’s advanced search function, I initially gathered all tweets having more than 10,000 likes and containing the keyword “bitcoin” through July 2022<sup>1</sup>.

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<sup>1</sup> Due to limitations of Twitter’s advanced search, it is possible that some tweets meeting the required 10,000 likes were not captured.

Each observation in the dataset contains:

- 1) The full content of the tweet
- 2) The date that it was posted
- 3) The number of likes
- 4) The number of followers the account has

There were initially 360 tweets meeting the criterion of referencing “bitcoin” and having 10,000 likes. I then dropped any tweets from accounts with fewer than 100,000 followers and those that were not directly related to bitcoin, resulting in a final dataset of 280 tweets. I manually classified each message’s attitude towards bitcoin to be positive, negative, or neutral: of the 280 tweets, 242 were positive, 20 were negative, and 18 were neutral. Bitcoin data: I collected BTC price and trading volume data from <https://bitcoincharts.com/>, where we manually collected the price in the minute when each tweet was posted, as well as 4 hours and 24 hours after the tweet was posted. Each observation’s bitcoin trading volume represents the number of trades in the hour before the hour the tweet was posted, as well as in the hour 4 and 24 hours later<sup>2</sup>.

### 3.2. Method

We run regressions of the following form:

$$outcome_i = \beta_0 + \beta_1 \cdot positive_i + \beta_2 \cdot negative_i + \varepsilon_i$$

where the *outcome* is the change in log price or log volume over a 4-hour or 24-hour period. We test whether positive and/or negative tweets result in different changes in price or changes in trading volume compared to neutral tweets, as well as whether these changes are different from zero (for example, testing the null hypothesis  $\beta_0 + \beta_1 = 0$ ).

## 4. RESULTS

Table 1 presents descriptive statistics for the sample, where Likes1000s is the number of likes the tweet received in thousands, Price0 is the price at the time the tweet was posted, Price4 is the price 4 hours later, Price24 is the price 24 hours later. Volume0 is the trading volume in the hour before the tweet was posted (in BTC traded), Volume4 is the trading volume 4 hours later, and Volume24 is the trading volume 24 hours later.

	Obs	Mean	Std. Dev.	Min	Max
Likes1000s	280	39.64786	72.76391	10	854.7
Price0	280	38088.72	15744.94	5297.89	66665.25
Volume0	280	294.8131	457.3522	1.89	3250.54
Price4	280	38238.56	15865.83	5538.28	66637.16
Volume4	280	333.4464	541.3324	11.12	6258.38
Price24	280	38178.45	15726.67	5504.91	66710
Volume24	280	303.0846	545.0407	4.69	6148.98

Table 1: Descriptive statistics

Table 2 presents the results of the four regressions, where each row represents a separate regression. The “Positive” column represents the total effect of a positive tweet on the dependent variable (i.e.  $\beta_0 + \beta_1$ ).

<sup>2</sup> That is, for any tweet posted between 18:00 and 18:59, we use the 17:00-18:00 flow data as the pre-tweet volume for that observation.

The “Negative” column represents the total effect of a negative tweet on the dependent variable (i.e.  $\beta_0 + \beta_2$ ). The “Neutral” column represents the total effect of a neutral tweet on the dependent variable (i.e.,  $\beta_0$ ). With the exception of positive tweets affecting volume 4 hours later and neutral tweets affecting volume 24 hours later, I find no statistically significant effects. The 4-hour volume effect might simply be an artifact of people tending to post tweets at a time of day when trading volume is about to pick up, and the 24-hour volume effect is a very noisy estimate (also note that we are not adjusting p values for multiple comparisons).

Dependent Variable	Positive (se)	Negative (se)	Neutral (se)
4-hour change in log price	.0024855 (.0015479)	.0031801 (.0053842)	.0066202 (.0056755)
24-hour change in log price	.0013874 (.0033825)	.0140191 (.0117659)	.0190836 (.0124024)
4-hour change in log volume	.1715928** (.0607944)	-.2074585 (.2114736)	.3264773 (.2229128)
24-hour change in log volume	.0184265 (.0676056)	-.2502362 (.2351665)	.5493553* (.2478872)
* $p < 0.05$ , ** $p < 0.01$			

Table 2: Regression results

## 5. DISCUSSION

Recent years hype on cryptocurrency, especially on bitcoin, has pulled much media attention on them. At the same time, it captured many celebrities’ eyes, and we started to see more crypto discussions on Twitter. This paper studies the relationship between popular tweets by celebrities and bitcoin price returns. We found that these tweets do not show very little relationship between the price and flow of Bitcoin. After doing regression analysis, we found there is a positive relationship between a positive tweet and bitcoin flow. However, we failed to find any relationship between the price and celebrities’ tweets. We recommend potential Bitcoin investors not put too much attention on popular tweets and posts made on Twitter by celebrities.

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## **BULGARIA AS AN ATTRACTIVE DESTINATION FOR GERMAN INVESTORS**

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### **ABSTRACT**

*After the political and socio-economic changes that occurred three decades ago, the interest in Bulgaria by foreign investors has grown. The traditionally good political, cultural and trade relations between Bulgaria and Germany, dating back to the end of the 19th century, were resumed. Trade exchange between the two countries, albeit with certain fluctuations, is constantly growing and in 2021 it is almost 10 billion euros. German investments in Bulgaria are also growing. About 30% of the 100 largest investors in Bulgaria are German or with German participation. German investments are evenly allocated to industries and regions of the country. The paper emphasizes the advantages that Bulgaria has and can offer to German investors, as well as the challenges that must be solved both at the country level and at the business level.*

**Keywords:** *advantage, Bulgaria, destination, Germany, investments*

### **1. INTRODUCTION**

Since the establishment of the Third Bulgarian State, when Alexander Battenberg became the first Bulgarian prince after the Liberation of Bulgaria, the close political, commercial and cultural relations between Bulgaria and Germany began. They strengthened and deepened after the election of the German prince Ferdinand I of Saxe-Coburg and Gotha as Bulgarian prince. Bulgaria was an unchanging ally of Germany until the mid-1940s. Trade and cultural exchange between the two countries, although less intense, continued during the Cold War. The political changes at the end of the 1990s affected both Bulgaria and Germany. A new beginning was made for relations between the two countries on a new political and economic basis. It is remarkable that the accession of Bulgaria to the European Union was during the German Presidency. Over the past three decades, relations between the two countries have been marked by growing trust and active cultural and trade exchanges. Commodity turnover between the two countries is constantly growing, and according to data from the Federal Ministry for Economic Affairs and Energy of Germany, in 2021 it is almost 10 billion euros (9.802 billion euros), with an increase of 19.43% compared to 2020. German investments in Bulgaria, although with certain fluctuations, are also growing. For the period 2017-2021, the volume of German investments is 1 136 billion euros. For comparison, for the previous five-year period (2012-2016), their volume was 675 million. Proof of the significance of trade and economic relations between the two countries is the opening in 2004 of the German-Bulgarian Chamber of Industry and Commerce (GBCIC). Bulgaria is becoming an increasingly attractive location for German investments.

Due to the challenges of the war and the COVID-19 pandemic, many German companies are moving their technical production closer to their main European markets. The number of these companies in Bulgaria exceeds 5 000. At the same time, many companies from Germany have already chosen our country and are sharing their positive experience. Among them are FESTO, Würth, Ottobock SE, Liebherr, etc. In 2021, the Bavarian company "FlihVus" chose Bulgaria to establish its "Knowledge New Sofia" – the company's competence center for activities from IT and digitalisation to marketing and accounting. The Center plans to hire 250 highly qualified specialists, of which around 60 are currently appointed. At the same time, investment projects are being launched in the field of the production of automotive components and in the field of information and communication technologies, which will create nearly 3 500 new jobs in Bulgaria (Money.bg, Targovsko-promishlena palata – Stara Zagora). German investments in Bulgaria have been positively evaluated not only by business, but also at a high political level. As Bulgarian President Rumen Radev notes, German investors in Bulgaria "deservedly won their most valuable capital – trust. About 30% of the 100 largest investors in Bulgaria are German or with German participation. Investments are evenly allocated to industries and regions in the country, more than half of them are "greenfield investments" – through the creation of a subsidiary company or affiliate – an indicator that German companies consider the business conditions in Bulgaria to be attractive and have intentions for a long-term presence in the country" (Yearbook of GBCIC, 2022). This paper examines the main advantages of Bulgaria as an investment destination, from the point of view of the members of the German-Bulgarian Chamber of Industry and Commerce. Attention is also paid to the problems and challenges they face in Bulgaria.

## **2. THE ADVANTAGES OF BULGARIA AS AN INVESTMENT DESTINATION**

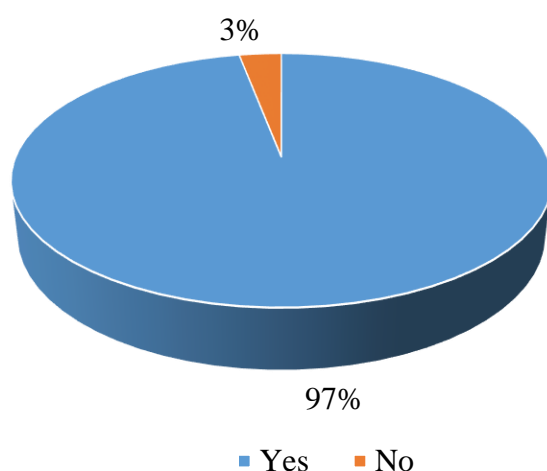
Bulgaria can be an attractive destination in medium-term planning, which aims to relocate the business of companies seeking to shorten supply chains and invest in countries in the region offering all the advantages of the single European market. The most important prerequisites for Bulgaria's attractiveness are stable macroeconomic indicators and a favourable investment climate in the years before the coronavirus pandemic, as well as maintaining the lowest EU tax rates, production and operating costs, in combination with an educated and highly qualified workforce. Low capital costs, together with low production and operating costs largely determine the choice of location for the investment. Bulgaria has a lot to offer – the prices of electricity and natural gas, mainly necessary for industry, are close to those in the EU. Low salary costs are particularly attractive to investors. The country has enough well-qualified employees who speak foreign languages and are ready to work for foreign companies. Thus, investors get excellent quality at a lower price. Macroeconomic stability and sound fiscal policy are prerequisites for sustainable convergence. Bulgaria is making progress in overcoming macro-economic imbalances in its economy. Sustainable convergence also requires stable institutions and a healthy institutional environment. Countries must have well-functioning goods and services markets and labour markets, which is essential to deal with macroeconomic shocks.

*Table following on the next page*

UN membership	1955
WTO membership	1996
a NATO member	2004
an EU member	2007
Territory	110 994 sq. km
Population	6.9 million
Skilled workforce	Highly educated young people speaking at least one foreign language - English, German, French
Business expenses	Lower expenses compared to other EU countries
Industrial parks	67
Attractive location	Strategic geographical position in the Balkans and in Europe, access to the sea
Economic Growth	Stable economic growth and a good investment rating (according to S&P, Moody`s and Fitch)
Tax structure	Lowest corporate tax in the EU

*Table 1: Advantages in the choice of Bulgaria as an investment destination*

Regarding the attraction of foreign direct investment (FDI), Bulgaria can offer good conditions to foreign investors. In the period 2017-2021, the inflow of FDI shows a constant growth and Bulgaria remains a preferred investment destination for the leading European economies. Recent surveys by GBCIC in Sofia show that 97% of German companies that have already made investments in the country would make the same choice and are even ready to expand.



*Figure 1: Willingness of companies to invest again in Bulgaria  
 (Source: Yearbook of GBCIC, 2021)*

The German-Bulgarian Chamber of Industry and Commerce's 2021 survey covered 60 chamber member companies, of which 31% were large enterprises with more than 250 employees. The answers to the question: "How satisfied are you with the mentioned factors for Bulgaria?" are illustrated in Figure 2.

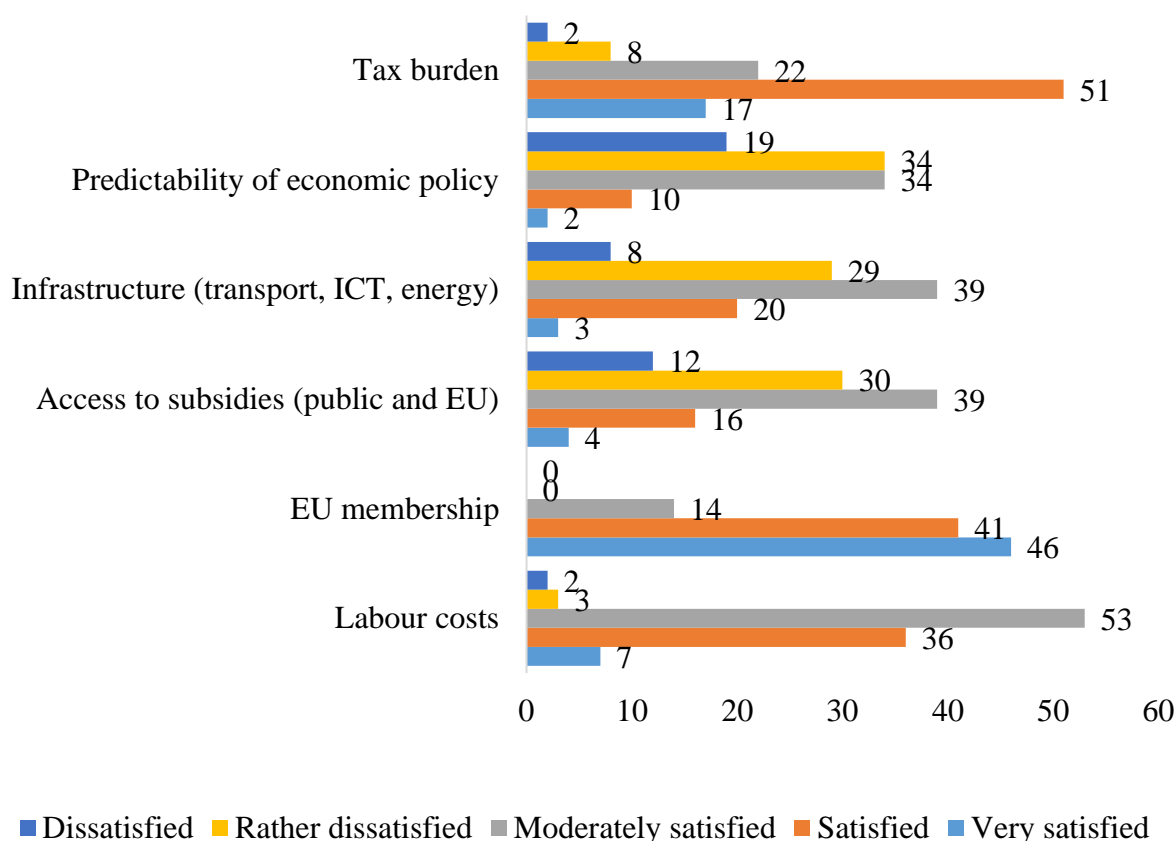


Figure 2: Distribution of replies to the question: “How satisfied are you with the mentioned factors for Bulgaria?”, in %  
 (Source: Yearbook of GBCIC, 2021)

The satisfaction with the mentioned factors shows that the main advantages of Bulgaria as a business destination can be formulated as follows:

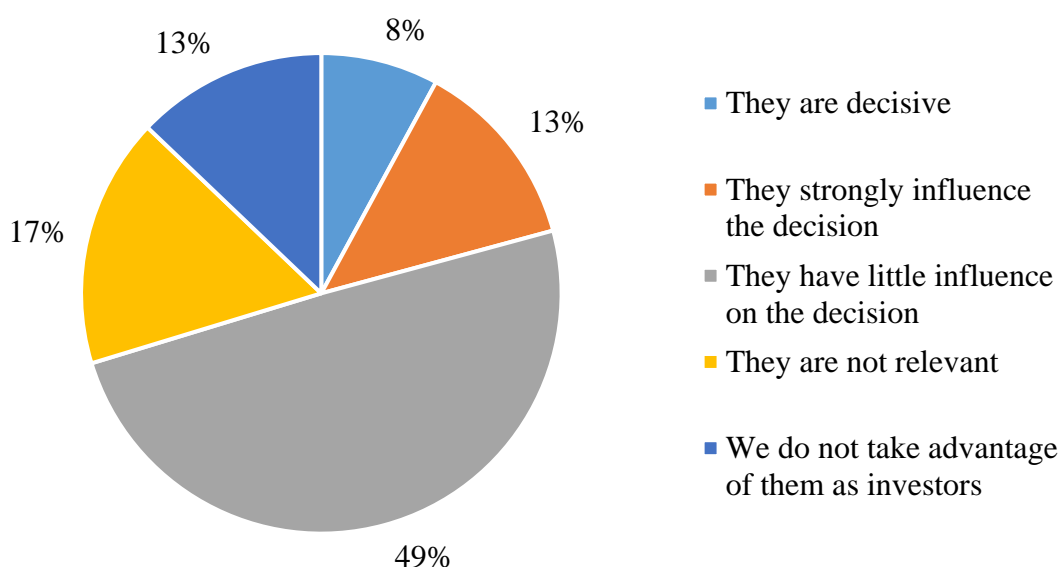
- strategic geographical location and the country's EU membership with all the resulting benefits for business and people;
- relatively cheap labour force with good qualifications;
- the tax burden, which remains the lowest in the EU;
- predictability of the government's economic policy;
- access to subsidies, incl. EU grants;
- relatively well-developed infrastructure.

### 3. CHALLENGES FOR THE BUSINESS AND THE STATE

The survey shows that, in addition to the good practices and advantages that Bulgaria offers, foreign investors also face a number of problems and vicious practices. The majority of respondents (71%) are dissatisfied with the fight against corruption and crime in Bulgaria. Only 2% answered that they were rather satisfied. According to the Corruption Perceptions Index of Transparency International (Corruption Perceptions Index, 2021), the “black sheep of the EU”, as Bulgaria is often called, ranks last among the EU member states. Despite political statement to fight corruption, there are no convictions on corruption charges in Bulgaria. Corruption undermines the foundations of fair market competition, creates uncertainty, deters potential investors and sometimes forces actual investors to pull their businesses out of the country. The problem of corruption in Bulgaria is persistent because of the ineffective fight against it or simply because of the reluctance of the institutions to fight this malpractice.

Regardless of the reasons, the result is a poor economic climate and lost investor confidence. Directly related to the corruption problem is the issue of transparency of public procurement. It is no coincidence that here again 70% of the respondents express their dissatisfaction. Practice shows that the most common violations in awarding public procurement, established by the authorities of the Audit Chamber, are the division of public procurement in order to circumvent the application of the law, discriminatory requirements in the criteria for selecting participants in the procedures, mixing criteria for selecting participants with indicators for evaluating effects, concluding public procurement contracts in violation of the law, unjustified amendment of public procurement contracts, unjustified application of negotiation procedures without notification under the Law on Public Procurement, non-compliance with the deadlines for sending various types of information for entry in the Register of Public Procurement, incorrect application of the requirements for the award of small public procurement, etc. (Katsarova, 2010). Only for 2020, violations found by the Public Financial Inspection Agency were 461, which is almost a third of the 1 520 public procurements inspected. All these violations lead to unequal status of the participants in the tenders and to the deterioration of the public procurement market. Almost half (46%) of companies express dissatisfaction with the work of public administration, which is a reflection of the institutional foundations of how countries are governed. Trust in public administration is declining, with only 15% satisfied companies, compared to 23% in 2019. In the Public Administration Development Strategy it is noted that "the quality of public administration has a direct impact on the economic environment and is a key factor in promoting productivity, competitiveness and economic growth". Therefore, business has greater expectations of institutions and their activities to ensure compliance with the rule of law, transparency and equality. Legal certainty is a principle in national and international law which holds that the law must provide those subject to it with the ability to regulate their conduct. Legal certainty, generally speaking, is related to the ability of business entities to predict their future behaviour and actions with a high degree of probability. More than half (56%) of the surveyed companies are not satisfied with legal certainty. This is alarming as investors expect sound legal systems, consistent application of laws, clear and predictable legal provisions that cannot be changed retrospectively. Regarding political and social stability, the level of satisfaction is below the average level for Central and Eastern Europe (10%). Businesses need not only educated young people in general, but those with certain knowledge, skills and competencies. In recent years, interest in vocational education has been declining, with the number of students in vocational high schools decreasing at a faster rate than the number in comprehensive schools. This fact is alarming for business, because the shortage of qualified personnel, a problem for all European economies, limits the opportunities for business growth, for undertaking new business ventures. Almost half of the companies express dissatisfaction with the quality of vocational education in Bulgaria (17% are satisfied). Closely related to this problem is the issue of the availability of workers/employees with specialized knowledge and skills. More than half of the surveyed companies (55%) negatively evaluate the opportunities to hire such people and point to "lack of qualified labour" as one of the main risks for the development of their companies. In addition, this lack leads to an increase in labour costs (60% of respondents). The high percentage of attitudes/propensity of German companies to invest in Bulgaria in 2021 (97% – see Figure 1) can be interpreted as a good overall assessment of the environment for doing business in Bulgaria, regardless of dissatisfaction with corruption and the legal order in the country. According to the head of the German-Bulgarian Chamber of Industry and Commerce in Sofia – Mitko Vassilev, it is rather a result of the general dissatisfaction in Bulgaria, since in the opinion of the respondents "German companies remain almost unaffected by the problem of corruption" (Nering, 02.10.2021). Moreover, 50% of them give Bulgaria the highest or second highest rating as a business destination (Nering, 02.10.2021).

Regarding this factor, the opinion of German companies has remained unchanged for the last more than 20 years. In 2010, not expecting an improvement in the domestic business climate, every nine out of ten companies would choose to invest in Bulgaria again, perceiving Bulgaria as a good place to invest, much better than Germany, Slovenia or Slovakia (Harizanova & Markov, 4.08.2010). Such a standpoint of German business in general can be interpreted as a probable future focus of its strategic investment activity, a priority role in the formation of which is played by various factors, but not the potential use of financial resources from European funds – according to 79% of respondents. For only 21% of them, the possibility to use financial resources from the European Union funds is of essential/decisive importance when making a decision to start a business venture in Bulgaria (Nering, 02.10.2021) (see Figure 3).



*Figure 3: Distribution of answers to the question: „How does the allocation of the European Union funds affect your investment decisions?“*  
 (Source: Yearbook of GBCIC, 2021)

The structured response of the respondents shows that, regardless of the presence/absence of the additional accelerator “European funds of doing business” (strategic initiatives, structural funds, operational programmes, etc.), investment intentions remain in the positive measurement scale. General positivism dominates and forms a sustainable trend of a favourable definition of the destination Bulgaria. The adverse effects of COVID-19, hard to predict geopolitical environment, disrupted logistics chains and the highly uncompetitive price level of resources complicate the decision-making process and have a negative impact on the tolerable level of business risk, but the strength of their adverse impact is in a relatively uniform range for almost any country as a potential business location. After 2020 and especially in 2022, the conceptual framework for assessing the attractiveness of business destinations changes significantly in terms of focus, priority indicators and permissible assessments. Basically, the specific screening of the business sector, the accumulated experience, the availability of timely reliable information, the established business contacts and the individual personal feeling of a successful localization alternative will be the factors that will have the greatest impact on the decision for German companies to implement entrepreneurial ideas in Bulgaria (or another destination). Good traditions and the significant presence of German companies as the second largest foreign investor will have an additional positive influence on future business intentions.

#### 4. CONCLUSION

The general review of the data on trade exchange, investment and business relations between Bulgaria and Germany confirms entrepreneurs' positive attitudes towards Bulgaria as a business destination. However, a deeper analysis of specific factors of the business environment reveals a number of "pitfalls", problems and challenges. Business, regardless of nationality, expects decisive action. Long-delayed and neglected by the state issues – for quality academic and professional education, for ensuring transparency in public procurement, for a stable and predictable economic policy, for dealing with corruption, must be resolved.

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## THE POLLUTION IN THE GLOBAL SOUTH UNDER THE REVIEW OF CLIMATE CHANGE

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### ABSTRACT

*Environmental awareness has emerged in the past hundred years, but, surprisingly, the gradual improvement of the natural environment in a large number of developed countries comes not only from the enhancement of government and public awareness of environmental protection but also from the countries in the Global South that has been polluted after globalization: transboundary movement of hazardous wastes, global timber trade and deforestation in developing countries, wildlife trade and loss of biodiversity, the international proliferation of toxic chemicals and the transfer of pollution-intensive industries to the global South. For the Global South, environmental protection, population pressure, and other issues are far less important than national development because they face the pressure of poverty, hunger, disease, and survival every day. This article will first describe how four main theories of international relations view this issue and demonstrate that the International Trade Organization and the Global North have the ability and right to help the Global South protect the environment when the Global South still cannot do so.*

**Keywords:** *Climate Change, Global South, energy, greenhouse gases, pollution*

### 1. INTRODUCTION

The turbulence of climate change threats we live in can be explained by the fact that people have taken their eyes off the primary goal of achieving sustainable human development. We have been preoccupied with finding new ways of making money while ignoring critical issues such as pollution and climate change. The existence of these global threats is a clear indication that the collective efforts to achieve sustainable economic growth have pre-maturely failed. However, there is still hope. We can still save the world if we collectively try to change our mindset and focus on what matters. While the WTO has primarily been criticized for its focus on free trade (including removing tariffs and quotas), it has recently begun addressing environmental issues. This paper will tackle the World Trade Organization's capability in combating climate change, offer the emerging economies a global agreement on environmental protection, renewable energy, and the global community effect solutions to pollution, scrutinize the impact of international trade, offer national policies mitigating the issue, analyze the ability of WTO and Global North in saving the South, and provide the study's literature.

### 2. THEORETICAL PERSPECTIVES

There are four major theoretical perspectives on political science. First, there is realism which states that international relations are based on power only (Copeland and Taylor, 1994, 755). Second, neo-liberal institutionalism states that interdependence can lead to cooperation (Meng et al., 2018, 4). Finally, social constructivism and critical theory, which state that some policies may lead to equality (Fuhr, 2021, 2724). In the context of the threat of climate change, the metastasis of the tumor is the inevitable result of global resource allocation because countries like China and India have started with a head-start regarding manufacturing.

They have been doing this for over forty years and hence cannot immediately stop increasing their production (OECD, n.d.). This will consequently harm its environment as well as other countries' ecosystems. The climate change problem we live in is the result of the last five decades of neo-liberal policies (Krugman et al., 1995, 357). One specific example is that international trade, as it is today, has metastasized because of the expansion of capitalism across borders (Lund-Thomsen, 2009). International trade has also been caused by a lack of global resource allocation for environmental protection and people's standard of living (Meng et al., 2018, 6). The global nimby deception does not exist because there are no objective reasons for its existence: pollution can be controlled by adequate regulations; its control does not include any significant cost. Because most politicians and business people do not understand this simple fact, they think that a regulation would affect their profits; hence they oppose it and prefer to impose a market system that actually aggravates the problem (OECD, n.d.). They would instead let the planet rot than take action against pollution!

### **3. THE WORLD TRADE ORGANIZATION CAPABILITY IN COMBATING CLIMATE CHANGE**

The World Trade Organization (WTO) has been criticized for causing harm to developing economies. However, many developing countries have actually benefited from membership in the WTO (Narlikar, 2019, 134). This paper investigates the impact of WTO membership on greenhouse gas emissions in developing countries by exploiting within-country variation due to differences in climatic conditions. Using annual data on CO<sub>2</sub> emissions and GDP from 139 countries between 1995 and 2017, one finds that countries with hotter climates are more likely to experience a reduction in greenhouse gas emissions following their accession to the WTO (Narlikar, 2019, 137). Moreover, one finds no significant evidence for an offsetting increase in non- CO<sub>2</sub> emissions after trade reform (Narlikar, 2019, 141). The findings suggest that removing tariff barriers increases production efficiency, leading to lower greenhouse gas emissions per unit of output, even though consumers may face higher prices once tariffs on imported goods are removed. Furthermore, there is no evidence that countries with hotter climates tend to rely more on emissions-intensive goods after accession to the WTO (Narlikar, 2019, 144). As such, there is no evidence of a trade-related climate externality in greenhouse gas emissions. On the contrary, the results suggest that WTO membership contributes to furthering climate policy objectives by decoupling economic activity from greenhouse gas emissions (Kumar, 2021, 462). From the perspective of those who believe in introducing a carbon trade, market-based instruments are often seen as the most effective way to reduce greenhouse gas (GHG) emissions (Krugman et al., 1995, 366). However, unlike other forms of taxes or subsidies, CO<sub>2</sub> trading has not gained momentum due to opposition from both industry and environmental groups. Among all global agreements, there is a tendency within the global North to treat climate change initiatives as a threat and prioritize economic growth over environmental sustainability. This has become a widespread belief in the United States and the European Union, as evidenced by recent decisions to leave the Kyoto Protocol and move forward with the Paris Agreement (Kumar, 2021, 462). There is a strong consensus among financial institutions that carbon markets lead to higher emissions reductions, but the industry remains cautious (Fuhr, 2021, 2733). While carbon markets may be more effective at eliminating some of the risks associated with regulation, they can also be detrimental to consumers of fossil fuels such as coal and oil. Warmer winters in Europe have increased demand for heating oil, causing a rise in prices (OECD, n.d.). According to Litonjua (2010, 53), proponents of carbon trading believe it can enhance efficiencies across all sectors in producing electricity, agriculture, and transportation fuels. In response, campaigners in the global South have turned to constitutional and political means of defending the climate through international law.

For example, as a reaction to perceived industrialist dominance, in 2008, Bolivia and Ecuador passed laws limiting greenhouse gas emissions and requiring industries to reduce their impact (Narlikar, 2019, 133). More recently, 16 American states have signed on to Initiative 21, which aims to fight climate change by limiting vehicle emissions (Narlikar, 2019, 137). While all these initiatives are commendable, they fail to fully assess the ability of CO<sub>2</sub> trading markets to address GHG emissions. This is because CO<sub>2</sub> trading is a financial market solution that trades emissions permits among businesses rather than obligating companies to reduce their overall output of GHGs by cutting down on fossil fuel use. As a result, CO<sub>2</sub> trading is not as effective at reducing carbon as some other policy options. However, this does not mean CO<sub>2</sub> trading cannot be used effectively. In response to these concerns, policymakers are drawing on the lessons from history and adapting the mechanisms of the Kyoto Protocol to allow for carbon trading (Gupta, 2016, 4). This can be done by creating unique markets for CO<sub>2</sub> permits that meet strict performance requirements and by not including fossil fuel industries in these markets. It is also essential to set up strict rules about how governments can use these markets for policy purposes. Climate change is a global challenge requiring a coordinated effort by countries worldwide. The World Trade Organization (WTO) does not have a mandate for multilateral environmental agreements (MEAs). The WTO is currently struggling with the question of interfering with national laws and regulations in the area of climate protection. Since 11 January 2016, the dispute settlement body has been confronted with cases where parties claim to comply with their obligations under an MEA without changing their national law or regulation (Kumar, 2021, 462). In these cases, WTO members risk being unable to take effective action on climate change as they will be bound by their international commitments rather than policies driven by national priorities.

## **4. SOLVING THE POLLUTION PROBLEM**

### **4.1. Emerging Economies**

A new kind of international trade should be encouraged as part of the solution to the pollution problem and arouse national awareness of environmental protection while ensuring that there is still space for development in the global south. This is an emerging economy based on developing countries' needs, focusing on local economic development priorities to achieve environmental objectives at the least cost in terms of pollution generation. The main characteristic of this emerging economy is that the primary responsibility for environmental protection lies with the target countries (Meng et al., 2018, 7). The early stages of an emerging economy are typical phases of development but have not yet reached a state of maturity in which the economy can function without external support. Therefore, many countries (such as China and India) are encouraged to take advantage of this opportunity and become part of the emerging economy (Lund-Thomsen, 2009). In many cases, these countries also have extensive experience in environmentally sound development, having learned from their developed neighbors' mistakes and their own past experiences. Emerging economies will grow faster than developed ones due to their growth strategies (Litonjua, 2010, 57). Therefore, a downturn in developed countries will positively impact emerging economies' economic expansion. Four steps can summarize the concept of the emerging economy: First, these countries have undergone a period of high and sustained growth. Second, their economic performance has been part of a distinct pattern from the developed world. Third, these new economic players are not only slowing down but also decelerating in their overall rate of progress toward industrialized status. Fourth and finally, despite often high per capita income levels, these countries still incur massive deficiencies in human development indicators compared to advanced economies such as the United States and Western Europe (Levinson, 2009, 2182). The problems associated with developing high-pollution cities in developing countries are manifold.

The growth of cities, and concomitant increases in income and consumption, have been associated historically with rising pollution levels—and this trend is continuing as urbanization has been accelerating in many developing countries (Lund-Thomsen, 2009). Growing pollution in the Global South caused by international trade is considered a global problem that can be addressed by recognizing the urbanization and industrialization process in developing nations and its environmental challenges (Meng et al., 2018, 2). By making efforts to achieve sustainable development at an early phase of industrial growth, it will be possible to reduce CO<sub>2</sub> emissions significantly. The problems associated with the development of emerging economies are many. A significant portion of the world's population lives in poverty and without access to basic services, such as water and sanitation (Lund-Thomsen, 2009). Increased international trade has been associated with a shift of manufacturing from developed to emerging ones, resulting in severe environmental degradation and human health impacts on local populations at risk (Litonjua, 2010, 61). The United Nations estimates that more than 140 million people do not have access to safe drinking water, and 2.6 billion people lack sanitation facilities (Martínez-Santos, 2017, 514). In addition to the apparent health impacts on individuals, poor environmental conditions have a negative impact on economic development. The World Health Organization (WHO) estimates that poor environmental conditions kill 1.7 million children under age five annually in developing countries through diarrheal disease and other causes related to contaminated water or inadequate sanitation facilities (World Health Organization, 2022). The health of the global environment is threatened by pollution, resource depletion, and climate change. The world's population is growing at an alarming rate, which has reduced natural resources such as clean water and arable land. The lack of access to safe drinking water and adequate sanitation facilities are major causes of disease transmission and mortality worldwide. Emerging economies face the dual challenge of a fast-growing population and increasing demands for consumer products, including food (OECD, n.d.). The rapid urbanization that accompanies economic growth leads to high pollution levels in cities, which can negatively impact human health. In addition, emerging economies tend to have limited resources to devote toward infrastructure development and public health programs. In many emerging economies, the gap between rich and poor is widening, which has led to increased crime and violence (OECD, n.d.). The increasing frequency of natural disasters such as floods and droughts has added to the complexity of dealing with these problems, in addition to aggravating existing health issues within affected communities. Opportunities exist for new governments and communities to control air pollution and lead efforts for environmental improvement. Past governments have sometimes not been fully committed to environmental protection or lacked resources or institutional capacity (Lund-Thomsen, 2009). This is why many countries have now formed environmental protection departments. Development strategies are dictated by the economic cycles and tend to generate economic waste. In order to reduce the economic waste induced by the boom-and-bust cycle, emerging economies must adopt sustainable development strategies toward more efficient energy policy, conservation measures, and urbanization. The emerging economy should focus on sustainable development.

#### **4.2. Global Agreement on Environmental Protection**

There are many ways of solving the problem of pollution in the Global South. One solution is to have a global agreement on environmental protection. This would require a worldwide pact, which is unlikely to happen soon. One approach to achieving a global agreement that might work is to start with more minor agreements first; if these prove successful, more countries will join until there is worldwide cooperation on environmental issues. For example, suppose some of the poorest countries can be convinced (by themselves as much as anybody else) that they benefit from protecting their environment and not polluting it. In that case, these applications can be scaled up to cover all countries.

In other words, small agreements can be used as stepping stones to achieve some form of global agreement finally. The small agreements could also achieve regional coverage before the larger ones are initiated. A group of countries might agree to stop certain activities polluting their environment and/or harming the poor people in their countries. Some of these activities will be obvious such as stopping industrial and agricultural pollution. A more difficult problem is what about something like burning cow dung for cooking, which many people in the Global South practice? By most environmental standards, this activity would look relatively benign compared to, say, a factory pouring toxic chemicals into a river. Nevertheless, many people in the Global South still burn cow dung for their cooking (Gupta, Aneja, and Rana, 2016, 4). The idea behind this approach is that if these people can be persuaded to stop this practice, others will want to do the same thing. This will pressure these other people to stop the activity, and thus the movement towards stopping it can begin. The objective of a global agreement is to make it possible to have good environmental policies in all countries. One way of achieving this is by giving some countries more money or resources to fulfill their obligations under an agreement they have made as part of the given agreement (OECD, n.d.). Another way would be to give more enforcement powers to officials in the countries that signed the agreement (OECD, n.d.). Essentially, for a country to fulfill its obligations under an agreement, it must have the resources and tools to enforce the agreement. If this cannot happen, then agreements on environmental protection will not be able to do much of anything. It is difficult for governments to enforce laws protecting their environment because the laws themselves are usually very vague and hard to understand (Lund-Thomsen, 2009). For instance, it is difficult for people in rich countries who are already living under good environmental standards (like air pollution controls) to understand and implement such laws. It is even harder for people in the Global South, who are used to living without such controls. It makes sense from an economic point of view that if we have air pollution controls in a country, we have to have some way of enforcing them. However, a fundamental problem with economic reasoning is that it does not consider how populations respond to incentives. The same person or government may be very costly to persuade for one particular law and then very cheap for another law. In other words, some laws are too expensive and/or will be ineffective, and others are too cheap and/or effective. Economic reasoning does not address both the costs and the effectiveness (enactment) of these laws.

#### **4.3. Renewable Energy**

The growing importance of international trade in industrial goods and services is likely to significantly impact the environment (Lund-Thomsen, 2009). In particular, trade liberalization could contribute greatly to environmental problems in the global South, such as pollution from exports from industrial North countries, such as China, to the South (Fuhr, 2021, 2741). Reducing CO<sub>2</sub> emissions through renewable energies is integral to reducing global warming and its adverse effects on humans and ecosystems. The significant advantage of renewable energy is that it is not subject to depletion or pollution. Renewable energies provide fuel sources. The use of non-fossil fuels is becoming increasingly important in the fight against global warming, with the potential to supply most of the world's energy needs without creating an enormous burden on the environment (Litonjua, 2010, 72). The use of traditional forms of fuel such as coal and petroleum has resulted in severe environmental damage during extraction, processing, and transportation. Alternative non-fossil fuels include wood (e.g., wood pellet), hydroelectricity (e.g., hydropower), solar power (e.g., solar photovoltaic panels), and wind power. While these advantages for renewable energy sources make them a preferred source of energy, there is the question of the economic viability of the renewable energy industry (Lund-Thomsen, 2009). According to energy experts, the future will see a drastic decline in oil consumption as countries switch to alternative forms of traditional fuels such as solar and wind power (OECD, n.d.).

Conventional fuels for electricity generation – such as coal, gas, and oil – have declined as countries have increasingly relied on cleaner sources, including nuclear power, hydroelectricity, and renewables. Renewable energy sources (including biofuels, solar, wind, geothermal, and hydropower) now constitute almost a quarter of the world's total installed power capacity. Thirty countries now use more renewable energy as a share of their power generation than fossil fuels (Mustafa, Ghazali, and Yuniza, 2022, 86). The International Energy Agency has recommended that 20 percent of the energy consumed in transportation should come from renewable sources by 2030. If this target is to be achieved, the use of biofuels will have to double by 2025 (Mustafa, Ghazali, and Yuniza, 2022, 94). Biofuels are an alternative source to petroleum as a fuel in vehicles, boats, and aircraft due to their efficiency in comparison with oil-based fuels (Levinson, 2009, 2187). Biofuels are used to fuel automobiles and small-scale aviation to help the environment by reducing carbon emissions. Biofuels provide a sustainable solution to global warming, as they can be produced from biomass waste such as plants, stalks, and straws. They are also considered a renewable energy source due to their ability of sustainability and regeneration. Biofuels' production involves converting raw food into fuel through anaerobic digestion or fermentation process (Owusu and Asumadu-Sarkodie, 2016, 303). It is not only a huge environmental issue but also poses ethical dilemmas. Some countries are directly promoting biofuels in order to meet their energy demands from renewable energies.

#### **4.4. The International Community Effect**

As an active member of the international community, the United States should take more vigorous action to protect the environment and alleviate the pollution problem caused by global economic activity. The first step is to work with other countries to reach a consensus on binding agreements that protect not just American interests but also global health and welfare (Litonjua, 2010, 76). A second step would be for multinational companies operating in the global south to adopt cleaner technologies compatible with the local environment; they will have to accomplish this transition over time (Mustafa, Ghazali, and Yuniza, 2022, 88). If these changes are made, there should be space for development in the global south and a greater quality of life for its inhabitants. According to many environmental experts, the concern over climate change should be considered an urgent international security threat. The only way to protect our planet is to end the exploitation of fossil fuels. The international community needs to take this issue more seriously and start taking immediate steps toward energy independence. This can be done by better understanding how to produce, transport, store and use energy with less of an impact on the environment. After the fall of the Soviet Union and the end of its political and economic challenges, Russia has once again emerged as a global player. Russia is a significant player in many international issues, from terrorism to environmental protection (e.g., nuclear nonproliferation). A major concern for Moscow has been ensuring that its energy security issues are not jeopardized by Western influence (Levinson, 2009, 2188). Russia believes that it has a great interest in achieving sustainability by becoming energy independent thanks to its own resources (Mustafa, Ghazali, and Yuniza, 2022, 87). In order to achieve this goal, Moscow has begun to develop renewable resources such as hydroelectricity and solar power. Major international players should reciprocate mother nature's good deeds by ensuring that substitute energy sources are employed to eliminate the upward trajectory posed by climate change.

#### **5. POLLUTION IN THE GLOBAL SOUTH**

The pollution of the global south by transnational production and trade has become one of the most critical topics in contemporary economic discourse. The literature on this subject can be broadly divided into two areas: one emphasizes the impact of international trade agreements and their insufficient environmental standards on the environment and development of poor countries and regions; another is more focused on how national policies can mitigate this

negative impact. This paper argues that both approaches have limited potential for addressing the problem as long as no real international cooperation exists between developed and developing nations.

## **6. EFFORTS TO SAVE THE SOUTH**

The World Trade Organization (WTO) is at the center of international trade and has become an essential factor in international resource allocation. However, the global environment has become a serious issue, and global environmental protection must be maintained. Therefore, the World Trade Organization should take on more responsibilities to help improve environmental quality, particularly in the South. At the same time, China is one of the largest economies in the world, and its economic policies have affected other countries. It is located in a region where the environment is severely polluted (Levander and Walter Mignolo, 2011, 11). Therefore, China should do more for environmental protection with higher responsibilities in this area. Despite these changes, international trade has had social and environmental costs that should reduce to create a better environment as predicted by ecological economics. Many scholars call for a "Green New Deal" to raise living standards while reducing greenhouse gas emissions (Mustafa, Ghazali, and Yuniza, 2022, 97). This requires raising social awareness to develop policies aimed at sustainable development and global governance reform (Copeland and Taylor, 1995, 764). There has been a rise in South-South trade and its effect on global CO<sub>2</sub> emissions, suggesting that the tumor's metastasis from the Global North to the Global South is not an inevitable result. In response to this argument, Krugman et al. (2022, 327-360) contend that it is not as simple as it may seem. The rise of the Global South and the rise in carbon emissions has sparked a debate about North-South trade, which some claim is necessary and inevitable. However, Levander and Mignolo (2011, 9) state that it is an illusion created by those who wish to preserve the status quo by blaming their pollution on developing countries rather than taking responsibility for their greenhouse gas emissions. Technology, international trade, and pollution from US manufacturing argue against this hypothesis by stating that no matter how many benefits US firms gain from outsourcing production to low-wage economies, they cannot avoid having to deal with environmental consequences due to their actions (Levander and Walter Mignolo, 2011, 7).

## **7. LITERATURE REVIEW**

The international allocation of industry and trade has already caused significant damage to the development of the Global South. The current form of international trade mainly considers economic efficiency and ignores both ecological protection and social justice, leading to severe environmental pollution in the Global South (Levander and Mignolo, 2011, 7). However, such a distribution is not a historical necessity but a result of globalization driven by neoliberalism. If the world wants to solve this problem, it should be done through active efforts by all countries within the framework of global governance reform. Humans have changed the environment tremendously since the Middle Ages. Industrial pollution has exacerbated ecological problems in some cases, but it has also made the environment healthier and more habitable on the whole. It is time to rethink this issue (Copeland and Taylor, 1995, 771). Industrial pollution is not an inevitable consequence of development but rather a cause for failure to achieve sustainable development. The production of goods and services beyond our consumption level does not improve the quality of life for all people but instead increases inequalities between countries in GDP and economic growth rates, along with environmental degradation (Levander and Walter Mignolo, 2011, 5). Globalization has disrupted ecological processes with harmful effects on local communities and ecosystems, leading to increased poverty, migration, and conflict resolution difficulties. For instance, economic growth and trade are essential factors that contribute to developing countries (Rehman et al., 2021, 30704).

The competition between companies also leads to innovation and technological progress, while interregional trade brings new knowledge and ideas to regions. However, some argue that the development of international trade negatively impacts the environment (Shukla et al., 2019). Strong economic growth tends to lead to an increase in resource consumption and energy consumption, which leads to air pollution and damage to water resources. Several studies have confirmed that there is a close relationship between industrialization and environmental degradation (Krugman et al., 1995, 327; Levander and Walter Mignolo, 2011, 9). For example, the manufacturing sector contributes significantly to China's total CO<sub>2</sub> emissions (Copeland and Taylor, 1995, 780; Rehman et al., 2021, 30711). Studies have shown that most industrial countries can reduce their carbon emissions under a scenario of climate change through technological innovation or improving energy efficiency (Krugman et al., 1995, 331; Shukla et al., 2019). A recent report by the US National Oceanic & Atmospheric Administration shows that China has become more extensive than the United States in terms of global warming caused mainly by greenhouse gas emissions (Rehman et al., 2021, 30712). This trend shows that developed countries have greater responsibilities for addressing climate change issues globally because they produced most of the climate change-related emissions in the past and are still significant players in this field today. Critical theorists explain the climate change threat we see today as a result of global economic inequality. Most countries in the global South do not have the resources needed to combat the effects of climate change, but they still have to deal with it because fossil fuels have been predominantly produced in developed countries and exported to developing ones -World Trade Organization- (Levander and Mignolo, 2011, 9). This fact has made it easier for developed countries to ignore their responsibility towards developing nations regarding climate change (Krugman et al., 1995, 344). The UN Framework Convention on Climate Change (UNFCCC) is an international treaty established in 1992 after the UN Conference on Environment and Development in Rio de Janeiro. This treaty set out hopes for reducing greenhouse gas emissions from industrialized countries; however, this has not happened (Shukla et al., 2019). Not only is this a problem for the future, but it is also having terrible effects on countries worldwide (Krugman et al., 1995, 353). The effects of climate change are seen through extreme weather events such as natural disasters such as floods or droughts and incidents like warmer winters and melting glaciers -the IPCC- (Rehman et al., 2021, 30713). This is immoral when one considers that human-caused climate change has negatively impacted developing countries because people do not have the resources to combat it. The Kyoto Protocol is an international treaty that deals with climate change. It was signed in 1997 and ratified by 130 countries (Gupta, 2016, 2). The Kyoto Protocol aims to reduce the levels of greenhouse gases (CO<sub>2</sub> and other greenhouse gases) emissions through national commitments (Gupta, 2016, 7). This is set out in Annex B of the Treaty, which outlines that parties should report on their respective national contributions and provide reports on their collective progress towards these commitments at least every five years (Gupta, 2016, 22). Kyoto Protocol has had a devastating effect on developing countries because many countries have not been able to make any progress toward meeting the targets set out in this treaty - UNFCCC- (Gupta, 2016, 19). Those who have made little progress are considered vulnerable, which, according to the Intergovernmental Panel on Climate Change (IPCC), could leave many countries at risk of climate change (Rehman et al., 2021, 30713). During 2015, the IPCC released a new report that states that we are likely to see more extreme temperatures and less rainfall in places like South America, Africa, and South East Asia (Shukla et al., 2019). This is because greenhouse gases have been accumulating in the atmosphere faster than they can be removed by natural processes (Krugman et al., 1995, 339). The effects of climate change will make it harder for people to survive in these countries, like, for example, significant floods that can destroy homes and small businesses. Some argue that if climate change is caused by human action, then we have a responsibility to fix this problem (Levander and Mignolo, 2011, 10).



The threat of climate change might be explained as a result of the clash between neo-liberal institutionalism and social constructivism (Krugman et al., 1995, 361). This clash is reflected on the other side of the coin, as well. Neo-liberal institutionalists' theory suggests that since they have created a new system, they can solve all problems in this system (Krugman et al., 1995, 342). At the same time, social constructivists focus on the problem itself rather than its solutions (Shukla et al., 2019). The problem of the global environmental crisis is primarily due to neoliberals' blind faith in their own decisions and actions, ignoring nature's own balancing mechanisms (such as carbon recycling), which could have avoided the current crisis. Climate change is one of humanity's greatest challenges but is also one of the most complex. While climate scientists argue that greenhouse gases should be reduced to avoid catastrophic changes, many politicians and citizens argue that, even if emissions reductions reduce global warming, they are likely to harm economic growth, with potentially catastrophic consequences (Krugman et al., 1995, 337). While it is true that economic activity has a significant impact on emissions levels, this impact can be modified by policy choices. Due to the rapid growth of global trade in the 21st century and its adverse environmental impact, there has been a widespread debate about whether international trade can be an environmental protection tool. This paper will argue that such an effort is possible if it benefits two parties: One is consumers who prefer free trade because it offers lower prices and greater variety in consumption choices; The other group is those whose manufacturing process produces more pollution than the rest of the world due to outdated technology and poor environmental policies.

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## THE NEW EU CORPORATE SUSTAINABILITY REPORTING FRAMEWORK IN THE CONTEXT OF GRI STANDARDS

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### ABSTRACT

*One of the main objectives of the June 2022 proposal for the Corporate Sustainability Reporting Directive (CSRD) of the European Parliament and of the Council is the transformation of the existing framework for integrated reporting by creating a comprehensive regulatory financial ecosystem for sustainable reporting. The intent is to ensure sustainability information that is publicly available, comprehensive, reliable, comparable and easily discoverable by interested parties with digital technologies. By dint of the paper's analyzed information, a comprehensive picture of the newly building European framework is systematized, examining what is necessary for the adoption of a new Corporate Sustainability Reporting Directive (CSRD), which by the end of 2022 will replace the current Directive 2014/95/EU Non-Financial Reporting Directive (NFRD). Secondly, an answer has been sought to determine to what extent the current regulatory framework, perceived as one of the most influential worldwide - more specifically the Standards of the Global Reporting Initiative, contributes or not to the achievement of the EU's ambitious goals regarding corporate sustainability reporting. A critical comment was made regarding practices that often use integrated reporting as a manipulative tool for corporate reputation management, including in the financial markets. Major inconsistencies and conceptual differences between the proposal for a new EU Corporate Sustainability Reporting Directive (CSRD 2022) and the existing consolidated set of GRI Standards (2022) are explored, systematized and presented. On this basis, arguments are posed in support of the need to develop and adopt widely applicable and at the same time clearly defined guidelines in the form of "viable" standards for corporate sustainability reporting at the European Union level.*

**Keywords:** *corporate sustainability reporting, CSRD, Global Reporting Initiative GRI, „greenwashing“*

### 1. INTRODUCTION

The requirement for disclosure of non-financial information in a more extended version, in the form of non-financial declarations by certain companies<sup>1</sup>, has been introduced at European level with the adoption of Directive 2014/95/EU (NFRD) amending Directive 2013/34/EU. As of the present moment, there is a number of regulatory frameworks and international standards applied as an instrument to control, mitigate and overcome a variety of environmental and social problems within the context of the UN concept for Sustainable Development (SD). Even as early as 2013, the European Parliament and the Council called for an increase in the funding by the private sector to cover the expenses relating to environment and climate, via introduction of stimuli that would encourage the companies to measure the environmental costs incurred by economic activity and the profit from using environmental protection related services.

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<sup>1</sup> Applied to large-scale enterprises of public interest with more than 500 employees.

The Commission Action Plan on Financing Sustainable Growth, published on March 8<sup>th</sup>, 2018, initiated a comprehensive strategy for financing sustainable growth. One of the main goals set out in the plan, was redirecting of cash flows towards sustainable investments for the achievement of sustainable growth. As a part of the Action Plan implementation and in relation to the EU requirements for the achievement of climate neutrality by 2050, the EC has issued guidelines supplementing the existing ones, on disclosure of climate related non-financial information, in compliance with Directive 2014/95/EU. The additional guidelines have been developed in compliance with the guidelines of the Task Force on Climate-Related Financial Disclosures created by the Financial Stability Board of the G-20, while taking into account certain international frameworks and standards developed by the Global Reporting Initiative (GRI), the International Integrated Reporting Council (IIRC), the Sustainability Accounting Standards Board (SASB), respectively the Value Reporting Foundation<sup>2</sup>, and others. What happens next on a EU level? Do we need European standards for corporate sustainability reporting, similar to the internationally adopted financial reporting standards notwithstanding the existence of already available standardization systems by other international institutions?

## **2. A CRITICAL VIEW ON THE ACCUMULATED EXPERIENCE IN THE REPORTING OF SUSTAINABLE BEHAVIOUR OF THE COMPANIES IN THE EU AS OF THE PRESENT MOMENT**

Despite the fact that at the current stage of development of the global society and international finance, worldwide there is a number of institutions, engaged in the development of integrated reporting frameworks regarding sustainable behaviour of the companies, GRI is still being considered the institution with the highest authority in the context of sustainability reporting. As the 2020 KPMG Survey of Sustainability Reporting confirmed, two thirds of the 5,200 top leading companies across 52 countries use GRI for their reporting<sup>3</sup>. This is probably due to the fact that GRI was the first to publish sustainable reporting guidelines worldwide back in year 2000. Perhaps this is the reason for the first European Directive in this area (Directive 2014/95/EU amending and supplementing Directive 2013/34/EC) to be significantly based on the GRI approach to integrated reporting in the representation of the companies specifically. For the whole period of more than 20 years, GRI has undergone a few development phases, including reaching a certain standardization level (by creating GRI Standards as a modular system of interconnected standards). The GRI guidelines have been developed to help the companies and their stakeholders in bringing out their contribution (or damage) to the sustainable development, based on the term “Triple Bottom Line” (accordingly, Triple Bottom Line Reporting). It has been deduced from the definition for sustainable development in the UN report from 1987 (known as the Brundtland Report, considered a fundamental and a turning point in the establishment of the contemporary sustainable development /SD/ concept). Thus, the SD concept is being reduced to providing basic information on the indicators which constitute the “Triple Bottom Line” (TBL). The latter naturally leads to detecting the difference between corporate results (first pillar/level of reporting – economic performance) and corporate impact (second level – social and third level – environmental performance). The development of GRI guidelines, including the last phase of evolution in the context of a set of three-level structure of Standards, proves that the introduced approach of integration of the three pillars (economic, environmental and social) as a consecutive arithmetical listing of three end results via their formal incorporation, is rendered rather meaningless. As pointed out by a number of researchers, this approach imposes thinking about each of the three elements rather individually than in an adequate integrated manner. Although the NFRD from 2014 officially regulated the term “integrated reporting” at a European level as well, there is a lot of criticism of it being a

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<sup>2</sup> where the Integrated Reporting Framework and the SASB standards were incorporated together later on

<sup>3</sup> GRI Annual Report 2021, p. 7, <https://www.globalreporting.org/about-gri/mission-history/gri-s-own-reports/>

mechanical integration of three different trends together, as if they are equivalent (Fonseca A., 2010). The main reasons for uncertainty within the meaning of the integrated report are the concerns regarding the process of assessment and summarization of economic, social and environmental data against integrated indicators. In other words, on the basis of which criteria do the reporting companies choose between various approaches regarding the potential significance of the individual indicators. This is particularly evident when the companies should aggregate indicators about their facilities and businesses, located in different geographical regions (countries/ continents), especially when they perform in settings with different social and labour and environmental legislations. A considerable majority of researchers, practicing accountants and managers argue about potential negative consequences from the sustainability reports, based on the GRI approach (Fonseca A., 2010). These problems demonstrate that the integrated reporting within the context of the GRI approach abounds with challenges and problems relating to the subjectivity of the input data and the output results. In order to avoid that, the integration process should be accompanied by a definition of sensitive indicators and clear thresholds for their determination (resp. achievement or failure). By reporting on the basis of the GRI approach, the companies assess their corporate impacts on the grounds of traditional criteria for company boundaries as used in financial accounting, and more specifically: legal property and control (Moneva José, P. Archel, C. Correa, 2006) within the independent reporting period at that. But within the context of the UN sustainability concept, the companies should account for their impacts in a much wider sense (from investors to various interested parties in the society, including future generations). The broadening of the reporting limits is necessary, in order to assess as objectively as possible “the imprint” of their activities, based on an analysis on the interaction between the company, the society and the environment. Since the adoption of the first European Directive in this area in 2014 until this day, in 2022, two specific terms with negative connotation have been imposed and established more and more on a global basis. They figuratively characterize and summarize respective phenomena caused by the intention to satisfy the UN SD Concept which, however, is “simplistically” covered by the GRI approach. And this approach, for its part, has been similarly transferred into the applicable European Directive as of the present moment (NFRD). These are the two similar phenomena: “*Cherry Picking*” (from the UN sustainable development goals)<sup>4</sup> and „*Greenwashing*“. These two terms are used to synthesize the following end-effect: how the broad variety of officially authorized and legally regulated variations and possibilities in the accounting and reporting, make it impossible to make meaningful comparisons between the performance of a company and their impact on sustainable development. In this area, the reporting via the GRI approach is often being “exploited” as an instrument for management and “embellishment” of corporate reputation, including intentional disinformation of the interested parties for the purpose of pursuit of competitive advantages. The two phenomena, leading to the same negative result for the society, can be described as follows:

- *Cherry Picking* means that the companies are able to freely and without any disturbance choose to disclose only data from sustainability measures that would present them in good light and bring them positives before the interested parties, while failing to integrate other data about their activities;
- *Greenwashing* is narrower in meaning and content and is being used in reference to companies that disclose misleading environmental information about their activities. It is used in cases where the declarations of a company that something is “green”, do not reflect reality. Therefore, it is identified as a deceptive technique of the integrated reporting for the purposes of environmental marketing and PR.

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<sup>4</sup> See for ex. Forestier, O. & R.E. Kim, Cherry-picking the Sustainable Development Goals: goal prioritization by national governments and implications for global governance, *Sustain. Dev.*, 28 (5) (2020), pp. 1269-1278, <https://onlinelibrary.wiley.com/doi/full/10.1002/sd.2082>

Both phenomena prove the GRI Guidelines, originally aiming at achieving greater transparency of the companies, are often used as window-dressing<sup>5</sup> or camouflaging of corporate unsustainability<sup>6</sup>. And this practically leads to removal from the original UN SD concept. Hence, the integrated reporting approach of the GRI can be considered a certain administrative reform turned out inadequate in terms of generating effect in favour of the interested parties. Another argument hereby is that in recent years, in lieu of the three pillars, globally, and even more on European scale, a newer concept has been adopted in the form of ESG, which three pillars have their specific aspects, nuances and correlations. The above facts increase the objective necessity for generally accepted mandatory standard requirements for sustainability reporting on the principle of those, used in financial reporting in the form of IAS/IFRS, which are mandatory for a certain circle of companies, as set out by EU regulations. There is an undeniable need of a next change process, combining and upgrading the use of traditional accounting models for business reporting to more complicated models that would allow to follow and assess the direct and indirect economic relations and impacts, in which a certain company has a role. This is precisely the direction of the initiated changes in the development of a new comprehensive regulatory framework for reporting corporate sustainability at an EU level.

### **3. TRANSITION FROM CURRENT NFRD TO COMPREHENSIVE REGULATORY FINANCIAL ECOSYSTEM FOR SUSTAINABLE REPORTING IN THE EU**

#### **3.1. Development and Upgrade of the New Comprehensive Regulatory Framework for Sustainable Reporting**

The major steps, undertaken by the EU in the past 2-3 years in the field of reporting, measurement and disclosure of corporate sustainability, have been subject to high positive assessment. The transition towards climate neutral and sustainable economics is not a single action, but a process over time. For companies, this transition means gradual and coherent reduction of environmental damage and achievement of sustainability. Hence, for the investors, the transition means gradual improvement of environmental results of the investment portfolio over time. The lack of unified standards in the non-financial sector, respectively the lack of comparable information, is a major challenge for the sustainable transition, as it deprives investors, creditors, counterparties and shareholders of the opportunity to distinguish the companies with clearly defined ESG strategies among those who advertise their business as “green” using misleading information about green practices (greenwashing). The comparable information and reporting of the sustainable development elements, differentiated and integrated in the collective term ESG (environment, social and governance), is considered a key component of the successful management of the climate change and they ought to have the same quality as the financial reports. The requirements for the ESG are consequently being transformed into a market standard, but it is of a primary importance to have unified criteria and a framework for their application.

*Table following on the next page*

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<sup>5</sup> Term used originally by Steven Kolk, see Kolk, S. (2003). Trends in sustainability reporting by the Fortune Global 250. *Business Strategy and the Environment*, 12, p. 279–291

<sup>6</sup> See Moneva José, P. Archel, C. Correa, GRI and the camouflaging of corporate unsustainability, *Accounting Forum*, Volume 30, Issue 2, 2006, Pages 121-137

Specific components of the new European Framework for Reporting and Financing of Corporate Sustainability	Impact – request for comprehensive regulatory financial ecosystem for sustainable reporting
- Regulation (EU) 2020/852 (The Taxonomy Regulation) on the establishment of a framework to facilitate sustainable investment  - Sustainable Finance Disclosure Regulation (SFDR)  - Directive regarding corporate sustainability reporting (CSRD)	- Qualitatively new basis for improvement of transparency; - Comprehensive instrument in favour of: <ul style="list-style-type: none"> <li>✓ the investors – for enabling opportunities for sustainable investments,</li> <li>✓ the regulatory bodies – for monitoring of the market discipline within the context of the European Green Deal.</li> </ul> - The established system for classification of environmentally sustainable economic activities aims to increase sustainable investing via redirecting financial resources towards enterprises with sustainable business models in accordance with the EU Taxonomy, including dealing with greenwashing.

*Table 1: Components of the European regulatory ecosystem for sustainable reporting  
 (Source: drawn up by the author in compliance with the current European legislation)*

The Taxonomy Regulation of the EU is a major factor for the mobilization of investments in long-term sustainable solutions. It defines the criteria for sustainable activities and for significant contributions to the achievement of EU's environmental goals, as well as "do no significant harm" principle. It is published as a peculiar fundament of the Sustainable Finance Disclosure Regulation<sup>7</sup> (SFDR), published a bit earlier. Using the information on the compliance with the taxonomy, the transition related investments, the financial institutions can assess the environmental ambitions and outcomes from their financed activities. It sets out the rules according to which the stock market participants take into consideration the level of sustainability and the thereby related risks in the formation of the investment solutions. It defines where and what information should be published by them in order for the investors to be aware what exactly defines a given investment product as "green". In order to meet these requirements, the investment funds shall rely on information from the companies they invest into, which shall apply additional (useful) pressure on the listed companies<sup>8</sup>. Next, in 2022, SFDR Regulation was supplemented by the proposal for Corporate Sustainability Reporting Directive (CSRD), which aims at amending the current Non-Financial Reporting Directive (NFRD). The new Directive requires that the companies disclose how their sustainability activities and strategies comply with the limitation of the global warming and the EU's climate related objectives. The major intention of this proposal is to define common European rules for sustainability reporting in a consistent and comparable manner, including in the form of standards. It has been set that these rules shall be applied by all large-scale companies and among the remainder of the companies (incl. SME) – by the ones whose securities are admitted for trading on a regulated market. The main effects to be attained via CSRD, are summarized as follows:

- To lay the foundations of a constant information flow regarding the sustainability in the financial chain of creation of value for other interested parties as well;
- To guarantee that companies' reporting in relation to the sustainability, will meet the needs of the participants in the financial markets, falling within the requirements of the SFDR (banks, insurance companies, asset management companies, investors, etc.).

<sup>7</sup> In power since March, 2021 r. Regulation EU 2019/2088 of the European Parliament and of the Council of 27 November 2019 on sustainability-related disclosures in the financial services sector (SFDR Regulation)

<sup>8</sup> It is also important to mention Communication From The Commission "EU Taxonomy, Corporate Sustainability Reporting, Sustainability Preferences and Fiduciary Duties: Directing finance towards the European Green Deal", Brussels, 21.4.2021 COM(2021) 188 final

Considering the significance of the financial sector, the European Parliament has been adopting specific measures for the participants in the financial markets in the process of investment and credit solution making, respective for the manner through which, they in turn take into account the environment related risks. The assessment of the integrated efficiency from the position of the SD concept and the corporate sustainability reporting, can be practically identified with the actions, undertaken by many market analysts whenever they assess the risks and the opportunities for companies whose financial instruments are being traded on the stock market. One of the most established global initiatives in this aspect is The Dow Jones Sustainability World Index. Within the context of all main components of the new framework for sustainability reporting, in January 2022, the European Banking Authority (EBA), in turn, introduced new rules. These are the so called Implementing Technical Standards (ITS) while taking into account the ESG risks the credit institutions are exposed to due to their exposure towards their clients. This is a significant step towards standardization of a disclosure process aiming to facilitate investors and credit institutions. The purpose of the rules is to provide comparability between bank reports, on one hand, and to include the climate change related risks and theirs impact on businesses and bank reports, on the other. In this regard, there have been defined coordinated requirements for company reporting (from the non-financial sector) in regard with sustainability, whereas the proposed Directive will provide compliance with the Taxonomy Regulation. On this basis, the companies within the range of the existing NFRD, as well as the companies, additionally included within the range of the newly proposed CSRD, shall be required to report three specific indicators for the level to which their activities fall into the “sustainable activities” term in compliance with the adopted EU taxonomy.

Specific Indicators	Criterion
- income share; - capital expenditures share; - operating costs share	Arising from or related to economic activities, defined as ecologically sustainable.

*Table 2: Types of disclosure indicators*  
 (Source: drawn up by the author in accordance with the SFDR Regulation)

It is provided that these indicators will be fully reflected in the mandatory reporting standards, which are in the process of development by virtue of the newly proposed Directive. In turn, these indicators will be coordinated with the indicators the financial market participants should account for in accordance with SFDR Regulation.

### **3.2. Major Inconsistencies and Conceptual Differences between CSRD (2022) and the Existing GRI standards**

Regulation (EU) 2019/2089 of the European Parliament binds the achievement of sustainability to the introduction of requirements for disclosure of environmental, social and governance (ESG) information about climatic transition that relocates the economic focus to the background from the three-pillar SD model applicable until recently. According to the structure and the contents of the GRI standards, the term “sustainability” is related to the disclosure of significant information about economic performance, environmental impact and social tolerance, related to a company’s activity, including the impact on human rights. This was embedded in the conceptual framework of the Global Reporting Initiative, notwithstanding the newer perception for sustainability that moves the focus from the economic performance of the companies, which has to do with increasing economic benefit, to their sustainable management. The significance of the information in regard with the impact of the company on the economics, the environment and the people, according to the Global Reporting Initiative, is a key concept to measure sustainability. The proposal for new directive (as well as the additional guidelines to the still active Directive 2014/95/EU on the disclosure of climate related information) is



based on the major principle of the so called “double materiality perspective”, whereas the requirements for disclosure of information are set in two directions. On the one hand, the company should report the impact it causes on people and environment implementing its activities, i.e. from the inside out. On the other hand, there is a requirement for disclosure of information about how the sustainability related matters affect the development, the outcomes and the state of the company, the policies it complies with and the impact caused by the compliance to these sustainability policies on the value of the specific company (i.e. from the outside in). The requirement to disclose such information is of a significant value to the investors as major interested parties, as they present possible risks and potential opportunities that would raise questions in regard with the sustainability of their investments. The impact from the climate change on the company within the second direction of materiality is not part of the conceptual framework of the GRI standards. This, in turn, does not meet the information needs of the interested parties for the purpose of directing private investments towards the achievement of climatic neutrality within the context of the new European framework for sustainable corporate reporting. The lack of mandatory obligation and unified rules for sustainability reporting for the EU companies, is a major obstacle in achieving comparability of the information on local, national and EU level. The opportunity for the companies to define independently the significant topics and to identify and assess their impact, is the basis for the application of the GRI standards which provide reporting guidelines, but no specific materiality requirements. The companies that apply GRI standards as a basis for sustainability reporting, are not obliged to use a specific disclosure format, which contradicts the achievement of a unified, machine-readable, single electronic format information about sustainability in accordance with the application of EU’s digital taxonomy. This practice does not comply with the proposal for the new directive regarding the establishment of a European common access point to public corporate information. The GRI standard information can be disclosed both via preparation of a separate report on sustainability, or through the company site, or as a part of the Annual Financial Report. The lack of requirement for standardization of the reporting form, makes the information hard to find, thus additionally impeding the interested parties. The additional guidelines regarding disclosure of climate related information, published in 2019, did not meet the expectations to achieve a significant improvement in the quality of the information disclosed by the companies in accordance with Directive 2014/95/EU. In order to achieve more complex and comprehensive reporting of comparable information about the sustainability of the companies in the EU, to be in compliance with the purposes of the European Green Deal for efficient utilization of the resources and achieving climate neutrality<sup>9</sup>, the proposal for the new directive is based on universal standards for reporting information in relation to sustainability, which the companies from all sectors should disclose, as well as sector standards with a defined set of indicators for information, the companies should disclose notwithstanding the sector they operate in. The role of these indicators is to qualitatively and quantitatively present the sustainability related risks and opportunities for the information users (the so-called interested parties). The review of the structure and the contents of the currently published consolidated set of GRI Standards 2022 (issued in the period between 2016 and 2022) shows classification in three main categories (series): universal, sector and topical standards. Universal standards define the requirements the companies will be obliged to comply with, disclosures they must implement in order to provide information regarding activities, management, policies, accountability, as well as guidelines to define the significant topics for disclosure.

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<sup>9</sup> COM(2019) 640 final, European Green Deal, Communication From The Commission To The European Parliament, The Council, The European Economic And Social Committee And The Committee Of The Regions, available online at: <https://eur-lex.europa.eu/>

Sector standards are currently only three and are unable to provide indicators for sustainable reporting for a major part of the companies from various economic sectors<sup>10</sup>, leading to a huge gap between the information on sustainability to be disclosed by the companies and the needs of the possible users of such information. Topical standards include guidelines for disclosure of information defined as significant by the companies, based on the GRI 3 standard regarding the impacts caused in specific topics – economic, social and environmental. These standards have been mostly applied since 2016 having no significant change in terms of structure and contents, which does not meet the growing requirements and new trends in the sustainability reporting.

№	Indicators	GRI Standards 2016-2022	New EU Standards for reporting sustainability (after 2023)
1.	Scope and Obligation of Reporting	Recommendable	Mandatory for the large-scale companies; SME, registered at a regulated market, excluding microenterprises
2.	Type of Information	Non-Financial Information	Sustainable Information
3.	Topical Fields for Disclosure of Sustainability-related Information	Economic, environmental and social	Environmental, social and managerial
4.	Materiality Concept	Impact caused by the company – economic, environmental and social	Double materiality perspective – environmental, social and managerial impact of the company, impact of the sustainability policies on the value of the company.
5.	Type of Capital Concept	None	Intellectual, human, social, natural capital
6.	Types/Groups of Standards	Universal, sector, topical standards (economic, environmental and social)	Universal and sector standards; system of indicators for classification and accounting of ecologically sustainable economic activities
7.	Reporting Format	Electronic format or on paper	Electronically readable in digital format: XHTML

*Table 3: Comparing GRI standards with the proposal for a new sustainability reporting framework in the EU as by main indicators*  
 (Source: drawn up by the author in accordance with the GRI standards and CSRD Proposal)

The forthcoming EU standards for reporting sustainability are meant to be a medium and an instrument facilitating both the business, and the investors and creditors in view of banking and capital-market-based financing. The first set of standards for reporting corporate sustainability in the history of the EU was initially planned to be adopted by the end of October 2022. Based on the official communications by the European Commission about delayed application date of the Regulatory Technical Standards (RTS) for the SFDR, it can be expected that the Sustainability Reporting Standards will be delayed as well<sup>11</sup>. The initially set deadline for their adoption and application by the large-scale companies in compliance with the requirements, is January 1<sup>st</sup>, 2023, and for the SME – as of January 1<sup>st</sup>, 2026. It is foreseen that the CSRD will affect approximately 49 000 companies – compared to close 11 000 that already apply the existing rules in accordance with the current NFRD. The remaining SME will be able to apply them voluntarily.

<sup>10</sup>The intent of the Global Reporting Initiative in regard with the sector standards is to increase the quality, the comprehensiveness and the consistency of the information reported by the companies, by developing standards for 40 sectors of the economy, starting with those with the greatest impact.

<sup>11</sup> Instead of applying as of 1st July 2022 these disclosure requirements would apply on 1st January 2023; <https://www.eurosif.org/news/infographic-on-sustainable-finance-disclosure-requirements/>

#### 4. ANALYSIS RESULT

EC's proposal for Corporate Sustainability Reporting Directive (CSRD) to replace the current Non-Financial Reporting Directive (NFRD) by 2022, in combination with the already enforced Taxonomy, Regulation and Technical Standards for the financial institutions – banks and investors, within the context of supporting the goals of EU's Green Deal, aims at:

- Introduction of unified written rules in the form of a set of Standards for reporting corporate sustainability and achieving comparability of the information on general EU level – as by relevant criteria for types of companies and institutions;
- Requirements for reporting sustainability affecting a larger number of companies, including the majority of SME;
- Necessity to adapt the financial system for supporting sustainable operation of the economy<sup>12</sup>, by developing a number of future instruments, such as the eco-labels of the EU for financial products in retail and the EU "green" bonds standard;
- Achieving proportionality in the reporting of environmental, social and managerial indicators, in view of the adoption of additional guidelines for disclosure of information, related to the three ESG aspects (climate, society and applied policies on corporate governance as a peculiar superior form of economic and financial management). The idea is to equalize the focus on environmental development with that of the social interaction of the business (human rights should not be ignored on behalf of eco politics, as the current NFRD allows). It is no coincidence that in the very name of the CSRD-2022, the term for integration ("non-financial reporting" in the previous NFRD-2014) has been completely replaced by "sustainability reporting";
- The liable companies must quickly adopt appropriate practices adapted to their business model, to build data collection systems and to disclose their progress in this aspect, as the information will be important for the redirecting of the capital resources and the financing of the green economy transition.

#### 5. CONCLUSION

The three documents: the EU Taxonomy Regulation; the Proposal for Corporate Sustainability Reporting Directive (CSRD) and the Sustainable Finance Disclosure Regulation (SFDR) can be considered components of a unified comprehensive framework for European economies in the "green transition" leading towards:

- unified definition of a given activity as "green";
- standardization in the assessment and the disclosure of sufficient in terms of quantity and quality information about how the companies manage their environmental and social challenges;
- redirecting of capital resources towards green economic activities.

In the short term, the identified practical challenges are not easily surmountable. They depend on the establishment and the upgrading of theoretical knowledge in the context of the experience already gained, as well as the deepening partnerships between the various international institutions engaged in the problems of the sustainable development and the corporate sustainability reporting. To that effect, the hopes placed on the first of their kind European standards for reporting of corporate sustainability, are heavy with high expectations and responsibility, as far as the EU has the ambition to undertake a leading role in the global cooperation for financing sustainable development. At the same time, in November 2021, the custodians of the IFRS foundation (resp. IAS Board) announced the establishment of a new

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<sup>12</sup> For example, increased access to sustainable development financing outside the currently existing market instruments for „green“ financing, in accordance with the EU Taxonomy.

council for the creation of International Sustainability Standards Board (ISBB) standards. It is intended for the ISSB to provide a comprehensive global base of standards for disclosure that would provide the participants on the capital market with information about the sustainability related risks and opportunities to support informed investment decision-making. Both from research and practical application perspective, it would be an interesting challenge to make a comparative analysis of the two sets of standards for sustainability reporting – the one of the EC and the other of ISSB. The coherence of the standards on a global scale is of a great significance for avoiding market fragmentation and creating opportunity for transborder investments for the achievement of the global goals in the field of environment.

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## REGIONAL EFFECTS OF DIRECT GERMAN INVESTMENTS IN BULGARIA (AURUBIS BULGARIA CASE)

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### ABSTRACT

*With the development of globalization, direct foreign investments constantly increase and play an even more important role in the economic growth and development of world economy. They create stable and sustainable relationships among economies, contribute to the transfer of knowledge, technologies, and know-how among countries, stimulate consumption. Both economic theory and practice acknowledge the significant role of direct foreign investment as a driving force for the growth of the benefiting countries. After the beginning of the transition towards market economy, Bulgaria also attracts foreign investments which are significant in volume, which, on the one hand shows that it is an open, contemporary economic system, while on the other, it contributes to its fitting in the global processes of integration. The Federal Republic of Germany is one of the leading foreign investors in Bulgaria, while Aurubis Bulgaria is the largest direct German investment in the country. This research focuses on the regional effects of the investment of Aurubis Bulgaria taking into consideration their diversity, forms of expression and versatility. The results of the research have shown that the enterprise has a significant impact on the socio-economic life in the region (Sredna Gora region), where its plant is located. They have confirmed the pre-defined thesis that the impact of Aurubis Bulgaria on the socio-economic life at regional level has both positive and negative expressions, but the positive ones prevail.*

**Keywords:** *Aurubis, Effect, FDI, Region*

### 1. INTRODUCTION

Attracting direct foreign investments (DFI) is in the basis of the government policies of the benefiting countries. DFI play an important role in the global value chains because they allow enterprises to connect and organize cross border production. They are also an additional source of funding (they provide an additional capital for the economy) and can be a solid development tool with the availability of a suitable political and economic environment. As part of the global economy, DFI have an impact not only on the economy of the benefiting country, but also on its policy and social life. When realizing DFI, we can observe not only positive development and favourable effects, but also some negative ones. The Federal Republic of Germany is a trade partner No. 1 of Bulgaria (Vranchev, 2022) and the most important foreign market for Bulgarian production. Over the past 5 years, the exchange of goods between the two countries has been constantly on the rise (a slight decline of 3.1% is registered during the pandemic 2020, but the following 2021 marks a significant growth of 19.5%). The import from Germany to Bulgaria in 2021 increases by 27.7%.

At the same time, the export from Bulgaria to Germany marks a growth of 14.5%. In addition, Germany is a key investor for the country. Despite showing some fluctuations, over the past ten years, German DFI have grown. According to research conducted by 16 German foreign trade chambers in Central and Eastern Europe in which 756 member enterprises participate, 100% of the investors in Bulgaria would invest again (Yearbook of the German-Bulgarian Chamber of Industry and Commerce, 2022). Many German enterprises invest and establish new production plants in Bulgaria. Some of them expand the already existing enterprises or establish production plants at new locations in the country. We can point out several specific examples: Next.e.GO Bulgaria Ltd. (building and managing an innovative plant for the assembly of electric vehicles e.GO in Lovech, 2021); Schwarz IT Bulgaria Ltd. (centre for software development and maintenance in Sofia, 2021); Matega Ltd. (enterprise for production of metal and wood components for sport weapons in Gabrovo, 2020); Bader Bulgaria KD (plant for the production of upholstery for the automotive industry in Rousse, 2020); Robert Bosch Ltd. (opening of Bosch Engineering Center Sofia, 2020); Bulgaria Air Maintenance Ltd. (expanding of the existing base operated by Lufthansa Technik in Sofia and establishing part 145, organization of technical support); Leoni Bulgaria Ltd. (cable strands plant in Pleven, 2020); Kaolin EAD (building a new plant for processing of quartz-kaolin material and infrastructure for the extraction of underground resources in Dulovo, 2019); Voss Automotive Bulgaria EOOD (production plant for integrated connecting system solutions, 2019); Ottobock Manufacturing Bulgaria EOOD (plant for the production and sale of orthopedic medical goods and components in Blagoevgrad, 2019), etc. The significance of DFI for the economic growth and development determines the research interest in this matter. The review of past research on this topic shows that authors avoid assessing all effects known to the theory and prefer to focus on the specific part of them or on specific aspect on the impact of DFI. Most research focuses on individual markers at macrolevel, whereas the object of research most often is at level country or a group of countries. Girma, Gong, Gorg & Lancheros (2015) study the expected direct and indirect effects of DFI on productivity; Almeida (2007) – the effects of the labour market on enterprises with foreign capital; The United Nations Conference on Trade and Development UNCTAD (2011) – direct foreign investments, the transfer and diffusion of technologies and sustainable development; Zeng & Eastin (2012) – the effects on the environment by direct foreign investments in less developed countries. There is consensus among most authors that there is a positive relationship between the flow of DFI and the economic growth, given that the benefiting countries have reached the minimum level of educational, technological and/or infrastructural development. In Bulgaria, a survey has been conducted (Mladenova, Dimitrov & Kolev, 2005) in 16 enterprises with foreign share. It aims to analyze the specific aspects of the import of DFI and their impact on the economy of the Varna district. A macroeconomic approach has been used. Numerous aspects of DFI have been researched – profile of the investments, forms and motives of their realization, connections with local suppliers, the occurred changes in the activity since the beginning of the investment, etc. The authors explain the difficulties in forming a representative sample and the reluctance of many of the respondents to participate in a survey. Acaravci & Ozturk (2012) research empirically the dependence between DFI, the export and the economic growth in 10 European countries, among which is Bulgaria. For this purpose, they use a co-integration analysis via an autoregression model with distribution lag (ARDL), developed by Pesaran and a causality test after Engle & Granger. They ascertain statistically significant short-term and long-term cause and effect relationship among direct foreign investments, the export and the gross domestic product in four of the countries. For Bulgaria, no long-term or unidirectional/bidirectional relationship among GDP, export and FDI has been ascertained. Despite the numerous papers on the topic, the issue of the regional effects of the flow of DFI in Bulgaria is still insufficiently researched. Studying the impact on the socio-economic life which a single foreign investment has is not a precedent.

For instance, such research has been conducted on the impact of Lidl Bulgaria, but it considers the total effects of the activity of the enterprise (Institute of Market Economy, 2020). The research team has directed their attention and efforts in the research of a solid and focused German investment (Aurubis Bulgaria) in a key export-oriented sector (copper processing) and its impact on the socio-economic life in the region where the enterprise is situated – the Sredna Gora region. The Sredna Gora region is a physic and geographic region in Bulgaria and comprises 7 municipalities (Zlatitsa, Pirdop, Chelopech, Koprivshitsa, Mirkovo, Anton, and Chavdar), which are heterogeneous in type, territory, number and structure of the population, composition, economic indicators, etc. Thus, for instance, some of the municipal centers are villages (Chavdar, Anton) and those municipalities consist of only one settlement; Pirdop municipality is about 7 times as large in population as Chavdar municipality, etc. The availability of natural resources, the proximity to the capital city of Sofia, the traditions in the development of certain productions and other factors determine the interest of investors in those municipalities. The subject of this research is the impact which the German investment in Aurubis Bulgaria has on the socio-economic life on the municipalities in the Sredna Gora region. The defined research thesis is: the impact of Aurubis Bulgaria on the socio-economic life in the municipalities of the Sredna Gora region has both positive and negative expressions (effects), but the positive ones prevail. The article researches various effects (employment and income, fiscal effects, competition development, multiplication effects, distribution effects, migration effects, etc.). In addition to the data provided by Aurubis Bulgaria Ltd. And the financial statement of the enterprise, we have used data by official sources such as the Bulgarian National Bank, the National Statistical Institute, the German-Bulgarian Chamber of Industry and Commerce, the Bulgarian Association of the Metallurgical Industry, etc.

## **2. ENTERPRISE PROFILE**

Aurubis (Aurubis AG, based in Hamburg, Germany) is a leading integrated group for the production of copper and the largest copper processor in the world. With an annual production of 1.2 million tons of copper cathodes, further processing, to various copper products and a wide range of services, the Aurubis Group is a world leader in the sector of copper production as well as in the recycling of copper waste. Aurubis has nearly 7,200 employees in over 20 countries, plants in Europe and the USA and a wide network for servicing and sale of copper products in Europe, Asia and North America. The main production is copper cathodes from copper concentrates, copper waste and recycled copper raw materials. Those are produced in the form of copper wire, pre-rolled tapes and half-finished copper products, as well as copper bars and profiles of copper and copper alloys. Part of the product range of the enterprise is other products such as sulphuric acid and metal silicates. Customers of Aurubis are enterprises of various industries such as metal processing, electrical engineering, electronics, chemical industry, automotive industry, construction, etc. Shares of Aurubis are part of Prime Standard Segment of the German Stock Exchange and are listed in MDAX Global Challenges Index (GCI). Aurubis Bulgaria, as part of Aurubis AG, is the largest German investment and the largest industrial tax payer in Bulgaria which plays a crucial role in the country's economy (Vranchev, 2022). The plant of Aurubis Bulgaria is located in the Sredna Gora region. The copper extraction and production started in the distant 1958 around the towns of Pirdop and Zlatitsa; it has become a traditional industry for the region and has a strong impact on the development of Bulgaria's industry. In September 1997, the international enterprise Union Miniere, headquartered in Brussels, Belgium, signs a privatization contract with the Bulgarian government thus acquiring the plant. In April 2005, the copper production of the Umicore group becomes an independent enterprise – Cumerio and its shares are registered on the Brussels stock exchange. The plant in the Sredna Gora region becomes Cumerio Copper.



In April 2008, the Cumerio group is acquired by Norddeutsche Affinerie AG (NA) following an approval by the European Commission at the beginning of the year. Norddeutsche Affinerie AG (NA) is renamed to Aurubis, whereas the Bulgarian plant – Aurubis Bulgaria. The new enterprise becomes the largest copper producer in Southeast Europe and plays a crucial role in the export of the Bulgarian economy. Currently, the enterprise consists of four main production units: metallurgical production; cathode copper refinery; installation for the production of sulphuric acid as a purification facility; copper slag enrichment plant. The enterprise has a research unit which creates innovative solutions, improvements, and modernization in the technologies for the production of copper and preservation of the environment. In 2015, the enterprise begins planning a new large-scale investment programme Aurubis Bulgaria Spectrum 2018 at a total value of EUR 180 million. The realization of the projects in the programme aim at: upgrading the technological equipment for additional preservation of the environment; improvement of the production processes, which will allow work at the maximum available capacity; realization of sustainable social projects for the development of the region, etc. Today, Aurubis Bulgaria is one of the largest enterprises in Bulgaria by generated revenues EUR 2.8 billion. During the pandemic 2020, the enterprise entered the top 5 of the largest enterprises in Southeast Europe.

### **3. IMPACT OF AURUBIS BULGARIA ON THE SOCIO-ECONOMIC LIFE OF THE MUNICIPALITIES IN THE SREDNA GORA REGION**

In addition to the effects on micro and macro level, which are the subject of another research (Vranchev, 2022), the activity of Aurubis Bulgaria has an impact on regional level, as well. With a view of the size of the enterprise, the impact which it has on the Sredna Gora region and the municipalities in which it is located, it is significant. It spreads not only to the Zlatitsa and Pirdop municipalities on whose territory it is located, but also to the neighbouring municipalities – Anton, Koprivshitsa, Mirkovo, Chavdar, and Chelopech, where the employees mostly live, as well as on the nearby municipalities of Etropole and Panagyurishte, where the copper extraction enterprises from which most of the raw materials for the production are purchased are located. In the period 2016-2020, the concentrates purchased by Bulgarian mining enterprises vary between 24% and 31% out of all processed concentrates in production. The main effect is related to the production and processing and finds direct reflection in the costs for raw materials and materials from local suppliers (located in the municipalities of Etropole and Panagyurishte). The secondary (indirect) effects on the supply chain of goods and services generate additional domestic demand in the local economy.

#### **3.1. Employment and incomes**

The direct investments encourage the establishment of new work positions, increase employment, and have a positive impact on the competitions on the labour market; they contribute to the transfer of knowledge, technologies, and know-how among the countries; they stimulate consumption. This effect is primarily observed with green investments in labour-intensive industries, whereas capital-intensive investments (e.g., raw materials extraction) or the acquisition of existing enterprises can have less strong or even negative impact on employment.

*Figure following on the next page*

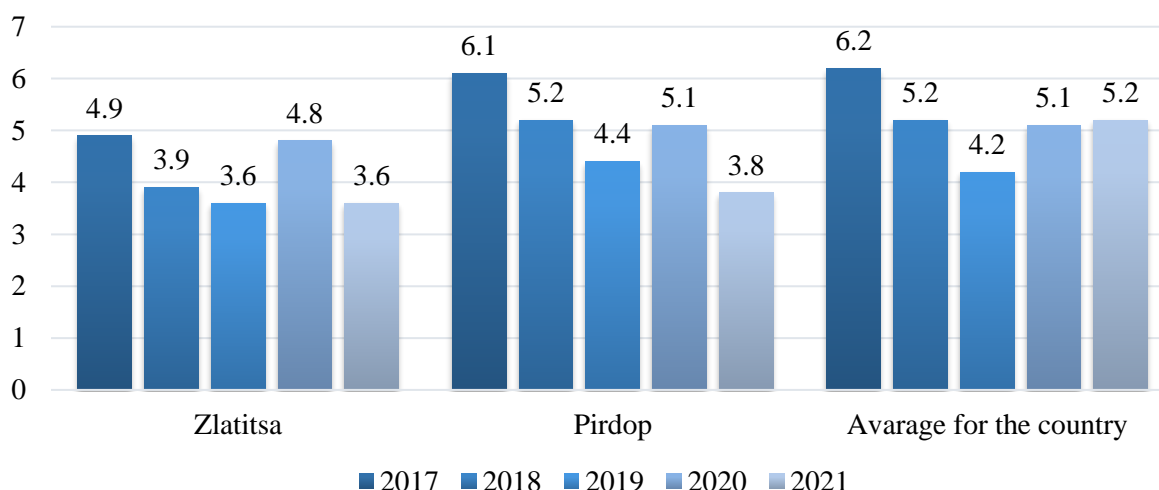


Figure 1: Unemployment coefficient for the period 2017-2021  
 (Source: National Statistical Institute)

With a view of the economic characteristic of the discussed municipalities, we have observed primarily stable labour market, with low unemployment coefficient over the last years, with high levels of employment and wages which exceed substantially the average for our country (see fig. 1 and 2). The availability of a major employer in relatively small municipalities is of crucial importance for providing constant employment. In certain cases, however, this domination of the market by one monopolist could have a negative impact on it. The enterprise has the greatest impact on the labour market in the Anton municipality with 70% of all employed persons. We should also bear in mind that this is the municipality with the smallest population. This is followed by the municipalities of Zlatitsa with nearly 60% and Pirdop with nearly 18%. An additional stimulus for the employed persons is the attractive pay, which is twice as large as the average for our country (fig. 2.). Aurubis Bulgaria is among the employers that pay the largest remunerations to its personnel in our country.

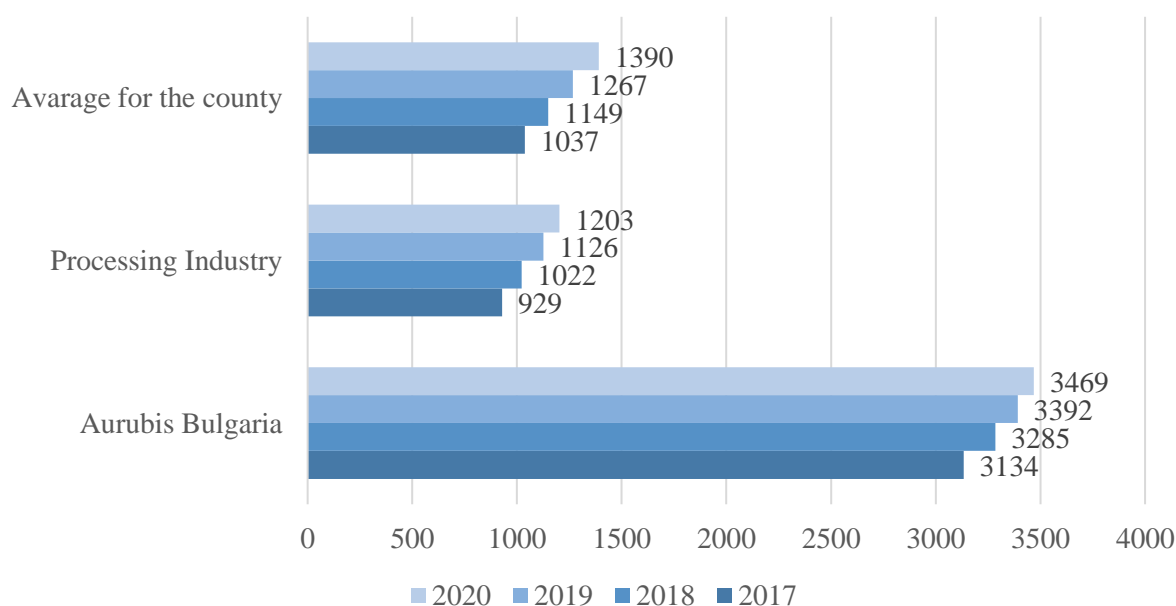


Figure 2: Average gross monthly wage for the period 2017-2020, in BGN.  
 (Source: NSI, data by Aurubis Bulgaria, and authors' calculations)

In 2020, the remuneration at the enterprise is 2.4 as high as the average gross monthly wage for our country and 2.8 as high as the one in the processing industry. Thus, the enterprise is an attractive employer for the population not only on the territory of the municipalities where it operates, but also in the neighbouring municipalities of Anton, Koprivshitsa, Mirkovo, Chavdar and Chelopech.

### 3.2. Fiscal effects

The direct and indirect taxes paid by Aurubis Bulgaria add to the local revenues and fill the treasury of the municipalities. The income from salaries which the enterprise pays to its employees are significantly higher than those paid by local enterprises. They are also taxed.

Year	Local taxes and fees paid by Aurubis Bulgaria, BGN		Share in the total income from taxes and fees of the municipality, %	
	Pirdop	Zlatitsa	Pirdop	Zlatitsa
<b>2017</b>	299,624	835,760	13.33	36.37
<b>2018</b>	298,975	834,704	15.98	35.06
<b>2019</b>	297,657	835,312	13.72	33.81
<b>2020</b>	296,707	834,882	14.34	35.08

*Table 1: Local taxes and fees paid by Aurubis Bulgaria in Pirdop and Zlatitsa, 2017-2020  
 (Source: Data by Aurubis Bulgaria, Ministry of Finance, and authors' calculations)*

In practice, however, this effect often weakens if the given enterprise benefits from the tax reliefs offered to foreign enterprises as stimuli to invest in our country. Those stimuli are most often in the form of partial return of the expenses made by the investor for the obligatory social security payments, subsidies for training and qualification of the personnel, etc. Such reliefs, according to the normative base, are used after the initial investment. Aurubis Bulgaria, however, has been in Bulgaria for a long time, it has made multiple further investments and does not benefit from such reliefs.

### 3.3. Spillover effects

Aurubis Bulgaria develops and implements innovative technologies and good managerial strategies, i.e., there is a transfer of technologies and knowledge. For instance, through offering training courses for improving the qualification, local employees acquire new skills. This leads to increasing the labour efficiency and competitiveness of the employees on the labour market. In the cases when they change their employer or set up their own enterprise, the local citizens can benefit from the innovations which they have already acquired at Aurubis Bulgaria. Thus, the spillover effects can increase as a whole the level of technology and productivity in the benefiting municipality.

### 3.4. Competition development

As a result of the competition from foreign enterprises, local enterprises can be forced to improve the quality of their products and services intended for the domestic market. This, respectively, can lead to increasing the export of local goods. A prerequisite for this effect is that local enterprises shall not be driven out of the market by foreign competitors before they complete the catching up process. In the Sredna Gora region municipalities, however, there is no other enterprise which operates in metal processing. Therefore, increasing the competition as an effect can be discussed from the point of view of struggling to obtain resources, in the first place, human resources.

### **3.5. Multiplier effects**

Creating work positions generates incomes. Some of them are expended for local goods and services, which increases the incomes of local producers. They, respectively, also expend some of their incomes in the local economy. Therefore, the initial increase of the incomes leads to increase of the demand, which can increase the total income. The multiplier effect also occurs with the purchase of local intermediate goods and with tax payments by Aurubis Bulgaria. Unlike other types of capital flows, direct foreign investments are characterized by the fact that they come along with more developed technologies and innovations and maintain constant connection with the host country. In addition, due to the long-term character of this investment, Aurubis Bulgaria's sudden withdrawal or leaving is highly improbable.

### **3.6. Allocation effects**

Within the benefiting country, the concentration of DFI in sectors or regions which are of particular interest to investors can create or worsen the inequality of incomes. The differences in payment, for instance, between foreign and local enterprises could deepen those inequalities. The effect is inequality in the incomes. This negative effect is well pronounced in the municipalities of the Sredna Gora region (fig. 2).

### **3.7. Migration effects**

The investment in Aurubis Bulgaria has a direct impact on the labour market and has indirect effects on the demography of the region. Here, migration can be discussed in two aspects: 1) as migration of foreign citizens employed at the enterprise and 2) migration of local citizens from the less developed in their economy municipalities to the municipalities on whose territory is located the plant of Aurubis Bulgaria – internal labour migration. In the first aspect, the effect is less pronounced because the number of foreign citizens employed at the enterprise is extremely low (only few people), primarily of its management. According to data about internal migration in 2021, it is positive only for the municipalities of Anton, Chavdar, and Chelopech (NSI, 21).

### **3.8. Effects along the line of corporate social responsibility of the enterprise**

Aurubis Bulgaria is strongly engaged with the realization of a number of activities which outline its social responsibility. Bearing in mind the specific characteristic of the metallurgical industry and its footprint on the environment, the enterprise engages in completing a series of measures directed towards: preventing the unorganized emissions from the cooling of convector slag; reducing the emissions of undissolved substances from the purification station for industrial water waste; reducing the dust emissions; re-cultivation of the fayalite depot, etc. To guarantee the compliance with the Bulgarian laws and company standards for preservation of the environment, Aurubis Bulgaria carefully selects and instructs all external enterprises with which it cooperates. It invests in the training and education, the health and safety of the enterprise's employees. For this purpose, it realizes various programmes (practices, internships, dual training programme which involves local vocational enterprises, for leadership development, etc.). The result of the realization of those programmes is prepared young specialists who have acquired specific know-how, specific technical skills and experience providing opportunities for realization in and out of the enterprise. The investments in training and improving the qualification lead to increasing the productivity and competitiveness on the labour market. The investments in new technologies lead to increasing the requirements to the employees' skills. Besides, annually, various social projects are realized by combining corporate values with the benefits for the local communities. Contracts are signed with the municipal authorities of Pirdop and Zlatitsa, complying with the priority needs off the specific municipality (helping disadvantaged people, educating talented children, sports initiatives,

cultural events, etc.). The Bulgarian charity forum awarded Aurubis Bulgaria as a Corporate Donor of the Year in 2011; the donations of the enterprise over the last 10 years exceed BGN 6 million. In addition to the contracts mentioned above, Aurubis Bulgaria participates in other social projects by cooperating with associations, local educational institutions, and other organizations interested in the future of the region. As a result of realized projects in the field of education, the following have been built, renovated and equipped: classrooms, canteens, playgrounds, etc., in the schools of the local municipalities; young sports talents have been sponsored. The enterprise also provides funding of about BGN 800,000 per year for the municipalities of Pirdop and Zlatitsa in the period 2017-2020. Annual contract is signed to support the hospital in Pirdop for current support when necessary (<https://www.aurubis.com/en/bulgaria>).

#### 4. CONCLUSION

The results of the research confirm the pre-defined thesis that the impact of the activity of Aurubis Bulgaria on the socio-economic life at regional level has both positive and negative expressions (e.g., inequality of incomes), but the positive ones prevail. The processing of copper concentrate at Aurubis Bulgaria means the most of the value added – from the copper extraction through its processing, the production of intermediate and end products – remains in Bulgaria, and more specifically – in the local economy of the discussed seven municipalities both in the municipalities of Etropole and Panagyurishte, on whose territory the copper extraction enterprises operate. This confirms the conclusion that the regional effect of Aurubis Bulgaria is strongly pronounced in the nine discussed municipalities both in the role of the company as a user of copper raw material, of various goods and services, which are supplied by local enterprises, and as an employer which provides high remunerations to its employees, who respectively create additional demand for local goods and services.

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## NON-FINANCIAL REPORTING - COMPONENT OF CORPORATE REPORTING

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### ABSTRACT

*Non-financial reporting is becoming an increasingly important component of corporate reporting. The obligation to publish non-financial information, which primarily includes information about the company's impact on the environment and society, i.e. information about corporate social responsibility, which is regulated by Directive 2014/95/EU, was implemented by the latest amendment to the Accounting Law (Official Gazette, No. 120/16.) into the national legislative framework of Republic of Croatia. In recent years, the awareness of stakeholders (investors, regulators, employees, customers, suppliers) has increased and the information provided in the financial statements is not sufficient to understand and present the complete business of a particular company. The paper aims to investigate and show the importance of non-financial reporting, the obligees of compiling a non-financial report, and the regulation governing non-financial reporting.*

**Keywords:** *non-financial reporting, financial reporting, regulation, corporate reporting, business management*

### 1. INTRODUCTION

The business environment is changing extremely fast today, and all those who are following the path towards competitiveness and business efficiency will increasingly emphasize the way they do business, the sustainability of the business, and the creation of value for customers in their practice. The quality of company management is also contributed by corporate reporting, financial and non-financial reporting, which today greatly contributes to greater visibility, and recognition and ultimately affect the sustainable development of the organization. The preparation of non-financial reports is becoming more and more common in companies because it provides information about its impact on the environment and society and contains or may contain information related to environmental, social, and personnel issues, issues of respect for human rights, and the fight against corruption and bribery. Non-financial reporting is not strictly regulated, it is only a recommendation to companies. We can say that companies often show ambiguities in the quality, form, content, and compliance of non-financial reports with legal regulations, which leads to uncertainty and questioning of stakeholders' expectations. Non-financial reporting helps identify areas for improvement and initiates a cycle of improvement. It also focuses on risk management because it enables the identification and improvement of critical points in the business process and thus enables the development of the reputation and contributes to the transparency of the organization. Companies have recognized the importance of non-financial reporting, through which they create trust and build a quality relationship with stakeholders, encourage changes and influence the transparency of operations, and achieve

easier access to capital. This paper aims to analyze and investigate the area of non-financial reporting (regarding the regulation of financial reporting), its legal regulation, and its contribution to the quality of business, transparency, recognition, and sustainability of the organization.

## **2. CORPORATE REPORTING**

Corporate reporting implies the publication of information and financial transparency (Dropulić Ružić, 2011). According to Gulin et al. (2016), corporate reporting is the reporting of business entities whose securities are traded on regulated financial markets and represents the main way in which business entities communicate with investors and other interested users as part of their responsibility and obligations towards them. Corporate reporting is a broader term than accounting and financial reporting. According to Radman Peša et al. (2017), the goal of accounting reporting is to record economic activities, while the goal of financial reporting is to process the results of accounting reporting, all to create information that points to the success of the company's operations. A quality regulatory framework of corporate reporting contributes to the very quality of corporate reporting, and an increasingly important aspect of corporate reporting is voluntary reporting. The distinction between mandatory and voluntary reporting is contained in the fact of whether or not there is a regulatory framework that prescribes reporting requirements. When we talk about mandatory financial reporting, we mean financial statements that business entities must compile and publish, as well as mandatory additional reporting required by the capital market regulator, which includes the publication of additional information, along with financial statements. Voluntary reporting represents an additional way of informing investors and other interested users and includes all financial and non-financial information that is not covered by mandatory reporting, and the coverage of voluntarily published information is determined by the management of the business entity. Corporate reporting does not only provide quantitative information, but also qualitative information, and the same does not have to be aimed only at the public and existing and potential investors. Corporate reporting is primarily aimed at investors, and its fundamental goal is to reduce the information gap between business entities whose securities are traded on regulated financial markets. Corporate reporting is continuously upgraded and improved from year to year and includes financial and non-financial information, i.e. financial reporting and reporting on non-financial information. Corporate reporting, as a form of voluntary reporting, is an additional way of informing investors and other interested users and includes all financial and non-financial information that is not covered by mandatory reporting. In this work, the emphasis is on non-financial reporting and non-financial information that results from non-financial reporting and is a component of corporate reporting.

## **3. FINANCIAL REPORTING AND ITS REGULATIONS**

Financial reporting has existed for many years and over time has changed and developed according to the needs of the market and its users, but always following the adopted accounting standards. According to Gulin et al. (2016) publication of financial accounting statements to external users must always be following generally accepted accounting principles, i.e. adopted international or national accounting standards (Gulin, Perčević, 2013:5). Accounting information is information that is needed in the management process. According to Oluić (2008) accounting information should be relevant and reliable, but above all understandable to users. Therefore, when talking about management, it is impossible to ignore accounting as a fundamental source of information (Žager et al., 2007). Users of financial statements are divided into two groups: (1) Internal users, and (2) External users (Dražić-Lutitsky et al., 2010).



The laws, standards, and rules governing the financial statements of entrepreneurs in the Republic of Croatia are:

- Law on Accounting (OG 78/15, 134/15, 120/16, 116/18, 42/20, 47/20),
- International Financial Reporting Standards - IFRS (which also includes International Accounting Standards - IAS),
- Croatian financial reporting standards - HSFI,
- Ordinance on the structure and content of annual financial statements (Official gazette., No. 95/16, 144/20).

According to Dražić Lutilsky et al. (2010), we can consider financial statements in the most general sense as accounting information presented in a specific standardized or non-standardized written form. The types and content of financial statements depend on their purpose, that is, on the requirements of their users, while the following can be classified under the framework of financial reporting: (1) accounting assumptions, (2) accounting principles, (3) accounting standards - Financial reporting standards, and (4) accounting policies. The goal of financial reporting is to provide information on the financial position, performance, and changes in the financial part of the reporting entity. Therefore, the general goal is to satisfy the needs of users for quality information that is needed when making various, usually economic, decisions.

#### **4. NON-FINANCIAL REPORTING – FRAMEWORK AND REGULATIONS**

Non-financial reporting is the process of preparing and publishing non-financial information about the efficient operation of a company in terms of social responsibility and the environment. Such efficiency includes the measurement of physical efficiency indicators, but also the financial qualification of the company through various measurements, e.g. workforce training, environmental costs, investment in employee training, etc. (Krivačić and Antunović 2018). Non-financial reports are intended for internal and external users of the company and complement the annual financial reports, improve the quality of the information contained in them, and highlight strategic values and future business directions in the coming periods, which leads to complete, measurable, and more specific reports. The development of non-financial reporting occurred in the 80s of the 20th century (Krivačić and Antunović 2018). In the literature, non-financial reporting is associated with terms such as reporting on sustainable development, reporting on socially responsible business, reporting on environmental protection, and three-balance reporting. The importance of such reporting has grown strongly in recent years, as information on corporate sustainability becomes increasingly important to investors, consumers, and other stakeholders when making decisions. For this purpose, the Sustainability Reporting Guidelines were developed, the goal of which is the harmonization and comparability of sustainability reporting, i.e. reporting on economic, environmental, and social impacts for business entities around the world (Global Reporting Initiative (GRI) 2013). In their work Gulin et al. (2016) point out that there is no standardized form of a report for publishing non-financial information, and some of the non-financial information that business entities publish are:

- general information and key indicators for the industry,
- brief history and development of the business entity,
- information about business goals and strategy,
- description of the main products and services,
- market share analysis,
- information about related persons and transactions with related persons,
- information about the achieved awards of the business entity,

- largest shareholders and voting rights,
- information on the market price of shares,
- CVs of members of the management board, supervisory board, and audit committee,
- code and policy of corporate governance and the manner of their implementation,
- development plan for new products and services,
- marketing plan,
- risk factors that can be predicted,
- information about employees (gender, age, qualifications),
- human resources management policy,
- information on employee salaries and bonuses,
- reward policy for board members and key management,
- attitude towards the environment,
- social responsibility,
- different forecasts and analyses.

Among the mentioned non-financial information, lately more and more attention is focused on sustainability and socially responsible business, therefore reporting on sustainability and social responsibility of business entities is one of the newer trends in corporate reporting, and their necessity is gaining importance. The reasons for reporting on the sustainability and social responsibility of business entities are contained in the knowledge of the importance of socially responsible business and reporting on the same for different users. With the growing development of non-financial reporting, international initiatives to promote non-financial reporting began to be launched, and the most famous one is the Global Reporting Initiative (GRI), which was founded in 1997. It is the first initiative to develop a comprehensive framework for sustainability reporting, while their latest version (G4) gradually evolved into the GRI Sustainability Reporting Standards. In 2014, the obligation of non-financial reporting was established at the level of the European Union according to Directive 2014/95/EU. The adoption of Directive 2014/95/EU on non-financial reporting followed the adoption of Accounting Directive 2013/34/EU. According to the aforementioned Directive, non-financial reporting implies the publication of all information related to the company's impact on the environment and society. The economic, social, and environmental dimensions are considered the most important dimensions of the business impact of each company and, according to the Directive, are the information that the entrepreneur must publish. The Directive does not introduce a standardized reporting framework, nor does it require the application of any standard for non-financial reporting, nor does it prescribe detailed content requirements for publication, but only that companies are obliged to publish non-financial information following the Directive. The Accounting Act (Official Gazette 78/15, 134/15, 120/16 and 116/18, 42/20, 47/20) transposed Directive 2014/95/EU of the European Parliament and of the Council of October 22, 2014, on the amendment of the Directive 2013/34/EU regarding the publication of non-financial information and information on the diversity of certain large companies and groups (Croatian Accounting Law). Those obliged to prepare non-financial reports according to the Directive on non-financial reporting 2014/95/EU, which entered into force at the beginning of 2017, are large entrepreneurs who are subjects of public interest and who, on the balance sheet date, have more than 500 employees during the previous business year (table 1). This report became fully mandatory for publication in the financial year starting from January 1, 2017, or during the calendar year 2017.

TYPE OF COMPANY	CRITERIA OF COMPANY SIZE
Large companies	more than 500 employees
	property value greater than EUR 20 million
	net turnover of more than 40 million euros
Subjects of public interest	Listed companies
	Credit institutions
	Insurance companies
	other entities of public interest which, due to their activities, size, or number of employees, are defined as such by the member state

*Table 1: Those obliged to compile and publish a non-financial report  
 (Source: Krivačić D., Antunović M.: Nefinancijsko izveštavanje: Novi izazov za korporativne računovodstvene sustave, Zbornik radova Veleučilišta u Šibeniku, 3 (4), 83 - 98, according to Directive 2014/95/EU and Directive 2013/34/EU)*

This form of non-financial reporting became mandatory in 2017, and EU member states had a two-year deadline to harmonize their national laws with the current Directive. The first non-financial reports were published in 2018. Directive 2014/95/EU according to Krivačić and Antunović (2018) requires companies to describe their business model, describe the risks of adopted policies, and encourage them to be guided by known reporting frameworks. The frameworks for compiling non-financial reports are not prescribed by Directive 2014/95/EU, so the frameworks of non-financial reporting according to Krivačić and Antunović (2018), which companies are encouraged to use are:

- Global Reporting Initiative (GRI),
- Eco-Management and Audit Scheme (EMAS)
- UN Global Compact (UNGC),
- Guiding principles on entrepreneurship and human rights for the implementation of the UN framework program "Protection, Respect, and Assistance",
- Guidelines for multinational companies of the Organization for Economic Co-operation and Development (OECD),
- Standard ISO 26000 of the International Organization for Standardization (ISO),
- Tripartite declaration on principles relating to multinational companies and social policy of the International Labor Organization (ILO).

When writing and compiling non-financial reports, a standard framework should be applied. One of the most commonly used frameworks is the Global Reporting Initiative (GRI) framework, but it is not necessary or even desirable to choose only one standardized non-financial reporting framework, but to study different guidelines and choose the one, or more, that best suits the business and profile of the organization. Non-financial reports that comply with the GRI Standards must include the following:

- Principles of reporting to determine the content and quality of reports,
- General information about the organization and its sustainability reporting practices,
- Access to the organization's management of each material topic for sustainability,
- Information about the organization's impacts related to economic, environmental, and social material topics (eg material topics for the sustainability of the organization can be Indirect Economic Impacts, Waste, Employment, Employee-Management Relations, Health and Safety in the Workplace, etc.).

The most common forms of non-financial reports in practice are the social responsibility report, the sustainability report, and the integrated report (table 2).

REPORT ON SOCIAL RESPONSIBILITY	SUSTAINABILITY REPORT	INTEGRATED REPORT
Systematic communication of entrepreneurs with stakeholders about their social and environmental impacts and the impacts of company management, which are not covered by financial performance indicators	A report published by an entrepreneur on the economic, environmental, and social impacts caused by daily business activities	Cohesive and efficient approach to reporting by entrepreneurs to improve the quality of information and enable a more efficient and productive allocation of capital

*Table 2: Definitions of separate non-financial statements used in practice*  
 (Source: Vukić, N. (2015) *Izveštavanje o nefinancijskim informacijama according to the new Law on Accounting and Directive 2014/95/EU, RRI, No. 12, pp. 48*)

To improve the consistency and comparability of non-financial reports that are published throughout the Union, non-financial reports should contain measures taken on: environmental, social, and personnel issues and issues related to human rights and the fight against corruption and bribery. According to the Accounting Law, Article 21.a. companies include in their management reports non-financial reports that contain information on the development, business results, and position of the entrepreneur, as well as on the effectiveness of his activities related to environmental, social, and personnel issues, respect for human rights, the fight against corruption and issues related to bribery. Non-financial information is also known as ESG environmental, social, and governance (ESG) information. Environmental issues include the areas of (1) the current and foreseeable effects of the company's operations on the environment and, if necessary, on health and safety, (2) the use of renewable and/or non-renewable energy sources, (3) the emission of greenhouse gases, (4) the use of water and (5) air pollution. Social and personnel issues deal with: (1) guaranteeing gender equality, and (2) implementation of fundamental conventions of the International Labor Organization, working conditions, social dialogue, respect for workers' right to information and consultation, respect for trade union rights, health and safety at work, and dialogue with local communities and/or on measures taken to ensure the protection and development of these communities. Human rights and the fight against corruption and bribery include information on the prevention of human rights violations and/or valid instruments for the fight against corruption and bribery. Non-financial reporting is still a big challenge in practice throughout the EU, especially for the level of its harmonization, where the aspiration is to establish transparent business concerning environmental, social, and personnel aspects of a business. Non-financial reporting as a process of preparing information about the company's effects in the context of sustainable development requires understanding by management, but also synchronization and supplementation from the aspect of financial reporting. Non-financial reporting directs the business and the organization toward future periods, creates a clearer picture of the entrepreneur's business, and contributes to the sustainability of the organization and its business. Non-financial reporting brings with it several advantages, such as long-term planning and investment, defining risks, negative impacts, and the impact of the organization itself on other market stakeholders, monitoring one's progress and social impact, achieving two-way communication with the environment, setting an example for others through the good practice of non-financial reporting, transparency, work on the image, better economic indicators, and others, which should become recognizable by management to fulfill the role of non-financial reporting. The goal of reporting on non-financial information is primarily to increase the transparency and comparability of entrepreneurs, however, according to international reporting frameworks and the Directive, entrepreneurs still retain the right to report only information that does not harm the business position of their company.

## 5. CONCLUSION

Sustainable business includes the economic performance of the company and its social responsibility while simultaneously protecting human and natural resources. Today, an indispensable component of corporate reporting is non-financial reporting which provides information on the economic, environmental, and social components of the business. Due to the growing need for transparent business and greater visibility, non-financial reporting is gaining more and more importance. Despite its importance, there are still problems and difficulties regarding the misunderstanding of non-financial reporting, which requires the entire process of their harmonization (regulatory requirements, transparency of reporting) to create reliable and comprehensive non-financial reports. The quality and transparency of financial reporting contribute to the development of the organization as well as society and its wider community, enabling easier comparability of companies, which can ultimately contribute to the improvement of business processes and organizational models, but also ultimately affect growth, development, and competitiveness on the market. Exactly all of the above should be achieved through the function of financial reporting in terms of non-financial reporting and in this way achieve their connection and cohesion, as well as the satisfaction of all stakeholders involved in the process of managing the organization. Quality and reliable financial reporting is the key to the organization's success, while non-financial reporting, on the other hand, carries with it a component of sustainability and the involvement of key internal and external stakeholders in the organization's management process. Progress in terms of non-financial reporting is visible, companies through their business strategies understand the importance of non-financial reporting, based on the legal framework they publish the same, whereby non-financial reporting ceases to be only a listing of environmental and social aspects of business and increasingly becomes quantification, analysis, and reporting of material aspects for the company and its stakeholders.

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## THE "CLEVER SUCKER" – THE IMAGE OF RESEARCHERS AMONG HUNGARIAN UNIVERSITY STUDENTS

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### **ABSTRACT**

*"A researcher is a 'clever sucker' who serves humanity but is not appreciated or not appreciated enough for it. He/she has a lot of work, but mostly little pay. There is some excitement in what he/she does, but it involves a lot of fiddling. The researcher has to go in many directions, but there are many dead ends. Thus it takes a very strong determination to choose this path. Without dedication, perseverance and patience, you cannot succeed." In short, this is the outcome of a qualitative survey among students on the perception of research careers in four universities. The focus groups made up of university students provided a lot of insights into what the image of researchers working in science and academia looks like from the outside and what could possibly make research careers attractive to members of Generation Z.*

**Keywords:** *research, research career, image, perception, focus group, qualitative study*

### **1. INTRODUCTION, THE AIM AND METHODOLOGY OF THE QUALITATIVE RESEARCH**

At the end of 2021, a research team led by the author of this article mapped what Generation Z, and more specifically university students, think about innovation. The first step of the two-phase research was a qualitative survey. On the one hand, the exploratory focus group procedure formed the basis for the second phase, a targeted questionnaire survey quantifying the significant points of the problem. On the other hand, a characteristic of qualitative research is that the exploration of perceptions and attitudes provides concrete results that can be interpreted in themselves, providing the basis of which action directions and recommendations can be formulated in relation to the research questions (Schleicher 2007, Babbie 2020).

In the qualitative phase, focus groups were used. This is an interview technique in which appropriately selected members of the target group participate in a joint interview. For methodological reasons, a group usually consists of eight people. The advantage of this method over individual interviews lies in the interaction of the participants in a lifelike group setting. The group situation provides an insight into how group members relate to, think about and feel about an 'object', product, service or concept (Vicsek 2006, Mitev et al 2015, Cyr 2019, Straus 2019, Krueger – Casey 2014, Morgan 2018, Stewart – Shamdasani 2014). In addition to the specific answers of the respondents, the comments attached to the response, gestures, and group dynamics all carry valuable information. One of the main strengths of focus group research is that it is better suited to 'modelling' opinion formation and debate than other methods.

The focus group is one of the most suitable tools to clarify an exploratory research question or to formulate hypotheses. It is also recommended for developing a general picture and gathering background information; generating creative ideas and new thoughts; identifying potential flaws in a draft; and gathering associations concerning the research question. In order to take into account the different life situations of the target group members (university students) and the resulting differences of opinion and views, the study sample was filtered according to the geographical location of the university of education and the field of study of university education.

We distinguished 3 groups according to the geographical location of the university:

- 1) Western Hungary (University of Sopron)
- 2) Budapest (Budapest Metropolitan University – METU, Budapest University of Technology and Economics – BME)
- 3) Eastern Hungary (Neumann János University, Kecskemét)

In terms of the field of university education, the research covered 3 groups:

- 1) Participants in economic courses
- 2) Participants in technical courses
- 3) Participants in social science courses

In order to get to know the widest possible spectrum of feedback and attitudes, four focus groups were held. This made it possible to identify the relevant aspects of university students and to control the distorting effects of any opinions that might appear accidentally.

Setup of the qualitative, focus group study		
Group 1 (Sopron)	Group 2-3 (Budapest: METU, BME)	Group 4 (Kecskemét)
<ul style="list-style-type: none"> <li>➤ 18-24 years old</li> <li>➤ Mixed composition in terms of the field of university education</li> </ul>	<ul style="list-style-type: none"> <li>➤ 18-24 years old</li> <li>➤ Mixed composition in terms of the field of university education</li> </ul>	<ul style="list-style-type: none"> <li>➤ 18-24 years old</li> <li>➤ Mixed composition in terms of the field of university education</li> </ul>
<ul style="list-style-type: none"> <li>➤ Men and women mixed</li> <li>➤ Even age distribution within the age zone in all groups</li> <li>➤ At least 2 people per group who have participated in a Students' Scientific Association (TDK)</li> <li>➤ At least 2 people per group who work alongside their studies</li> <li>➤ At least 2 people per group who have their own business or are involved in a family business</li> </ul>		

*Table 1: Main characteristics of the qualitative focus group study, sampling  
 (Source: own research, 2021)*

The qualitative research covered several areas, such as: attitudes of Generation Z towards innovation; Meanings and perceptions of innovation; Participation in innovation; Aspects of innovation promotion in the 18-24 age group; Characteristics of innovative thinking; The meaning of the word startup and attitudes towards it; Entrepreneurship and launching startups; The ideal startup organisation; Self-perceptions of Generation Z; and last but not least, perceptions of research careers. In terms of the latter, the following questions were discussed with students during focus groups:

- "What do you think of a career in research? What do you think of the words research, researcher?"
- "How do you see research and the results of research affecting your immediate environment and your own life?"
- "What do you think are the ways to make scientific research as a career interesting for the 18-24 year old generation Z?"

In addition, we also asked them to describe what they think a typical researcher looks like:

*"Imagine that we are waiting for a typical researcher. Suddenly there is a knock on the door and here he/she is. Describe what he/she is like. (Look, appearance, interior, marital status, financial status, health, gender, age, grooming, character, dress, style of behaviour, etc.)"*



- *How does he/she live?*
- *What is most important to him/her?*
- *Does he/she have goals and plans? What are they?*
- *How successful is he/she, how satisfied is he/she with his/her life, is he/she happy?*
- *What does he/she do in his/her spare time? Does he/she like to have fun? How? What does he/she spend his/her money on?*
- *How does he/she behave: in a group of friends, with strangers, with men, with women?*
- *How attractive is his/her way of life to you? In what ways would you like to be like him/her and in what ways would you not? Why?*

## **2. GENERAL RESULTS: PERCEPTIONS OF A CAREER IN RESEARCH**

It can be said that there is ambivalence in the researchers' perceptions. In simple terms, the typical view was that the researcher was a "clever sucker" who served humanity but was not or not sufficiently appreciated for it. The first reactions to the word research and researcher were as follows – the information in brackets, in italics indicate what was said in the focus group:

- A smart person who has the innate ability and dedication to research. (*"He/she is quite a clever person, actually, there are people who are born with it in them, that they are a bit more advanced than, say, the average person, they do research on these things, or someone is interested in it, and not everyone is born to do research, even if they want to, but they are not as good at it as someone who is born to it, so to speak.";* *"You can also say that it's a way of life, that he/she thinks about it day and night, 0-24."*)
- The researcher serves the whole of humanity, but it may not benefit the individual, it may not pay off, he/she may not be "rewarded." (*"Actually, it occurs to me that those who do research are not really serving man himself, but rather humanity, because let's say someone starts doing research in physics, whatever, in some discipline, he/she has an idea and not necessarily in his/her lifetime, but maybe one or two years later it will be useful to humanity, but not to that person in his/her lifetime. It's for example a negativ aspect to it.";* *"Yes, the result that he/she succeeded but he/she leaves disappointed."*)

Primary associations with a research career:

- A lot of work
- Low pay
- Excitement
- Lots of fiddling, going in many directions and lots of dead ends
- Testing
- Patience
- Dedication, perseverance
- Learning new information, gaining experience
- Very strong determination

It is fair to say that many young people do not find a career in research financially rewarding. They associate this with conditions in Hungary, where they consider it to be valid. Financial appreciation is also considered to be much more important in foreign companies or in foreign companies in Hungary. Researchers in Hungary are seen as working out of dedication, putting aside their situation, and this is their motivational base. (*"Financially they are ... poor. ... Yes.";* *"There are some topics that are funded by grants, but not everything.";* *"A career in research, the problem is that someone comes up with something really good, but doesn't get there because they starve to death in the meantime. A lot of research careers are that someone does research and if it's not that popular, then he/she has to work on something else besides it."*

*Minimum resources for living, minimum wage is likely. You have to be rather dedicated, you have to be more driven by the feeling that the person who wants to do it, does not necessarily do it because of such external material factors but because of their personal factors, I mean, people who are like that want to change the world.")*

According to the participants of the focus groups, in Hungary, a career in research is stressful, especially in the private sector. There are grants that can make a research career rewarding, but it is difficult to plan for. There is ambivalence in the situation, as they find the researchers' job interesting and attractive, but it is a lot of work, which can only be done out of dedication. In the past, interviewees described their generation as being distinctly resentful of the workload and existential insecurity. (*"I used to work in a research company, the fact that you see Hungary as a starting point. ... It was a chemical engineering company, a surface treatment company, but researchers don't just exist, there are universities and companies that have very tough tenders and receive huge sums of money; the research thing, the fact that in our country research is unfortunately now intertwined in such a way that research is done in the university, and the financial situation there is not necessarily perfect, they are not paid as much, that's one thing, but research work involves a lot of setbacks, it's much more stressful than people imagine, it's also a huge pressure, it really is, especially if you're in a competitive company. It's good, and it's very interesting, I liked that part of it, but you have to pick up the pace, there's as much work as in a production company, it's not all like you're there three times a day having coffee for two hours, but it is a good career really, but dedication is needed, that's a fact, but you also have to admit that it involves a lot of work."*) Those who would like to be researchers stressed the importance of the topic of interest. The topicality of the pandemic was a key factor in this assessment. Health issues came to the fore. (*"I mentioned that, yes I did. I'm very interested in the topic itself and how it could be stopped, there are epidemics for which there is no medicine to date, they can only slow it down or alleviate the symptoms."; "I'm mainly interested in diseases. However, I'm a business and marketing major, but I didn't study biology in high school, so I didn't have the opportunity to go to medical school."*)

Aspects that enhance the attractiveness of a research career:

- The results of the research could be of breakthrough significance (*"It could be attractive at the level of revealing how society now feels about certain things and whether that again could help companies in how strongly they need to communicate about something, where the breakthrough could be."*)
- Research work is a creative activity – ambivalence about whether it can be afforded as a hobby (*"Very creative."; "When I'm on a stable footing, with a massive income, then."*)
- It promotes development, innovation (*"He helps us with data that, let's say, promotes innovation."*)

Not attractive in a research career:

- They see the life of the researcher as a lonely, isolated world, where the researcher misses out on a lot of things because he/she is solely focused on research (*"It's such a lonely and isolated world."; "For me it's not because he/she misses out on a lot of things, human relationships, because he/she is focused on one goal, having a good idea that he/she has to do, putting all his/her time into it."*)
- It is risky in the sense that there is a lot of competition and the results may expire in a short period of time. The work invested will not pay off in that case. (*"It's difficult because what if you're doing research on a topic and a year later a much better solution and comes, you find out that it's all been a waste of time."*)

### 3. IMPERSONATION: 'THE TYPICAL RESEARCHER'

As already mentioned, the focus group participants were asked to try to imagine a typical researcher who has all the hallmarks of a researcher. The projective exercise revealed hidden attitudes to researchers' careers. The impersonation was not clear. Opinions that included contrasts were based on different personal experiences or on various film experiences (e.g. Indiana Jones, The Big Bang Theory). The gender of the "typical researcher":

- More like a man (*"Man. Male. The overall average is a man."; "Male."; "I'd like to think it could be a woman, but because of the stereotype a man comes into my mind."*)
- It could be a woman (*"She's about 40-50, more like a woman. She doesn't care about her appearance, about looks; she cares about being clean and tidy, but her most important topic is not dressing fashionably, her focus is not looks."*)
- Unclear definition of gender (*"It doesn't matter if it's a man or a woman, he/she does research, is dedicated and persistent"; "I wouldn't define that clearly"; "When I hear 'researcher', I think of a picture, and I can't imagine it's only a man; I think of a woman and a man, I can't imagine it's only a man"*).

Age of the "typical researcher":

- Old (*"Wears glasses. Old."*)
- Could be young – The Big Bang Theory series effect (*"It's completely random, in The Big Bang Theory, for example, Sheldon Cooper is a very young man, a twenty-something year old man who won the Nobel Prize, that's what the series is about."*)
- Middle-aged (*"I'd say around 40."; "I'd say 40-50. ... That's when careers tend to be at their peak."; "I'd say 30, under 30 is very rare, over 40 yes, more from 30 onwards." "I'd imagine middle age, above 45, that's when you can really fulfil your potential professionally, not being an assistant, not being an intern and maybe being the leader of something."*)

The characteristics of a "typical researcher":

- Organized (*"Likes order very much."*)
- Curious, passionate (*"Curious. Can be passionate about a subject."*)
- Team player (*"Team player, usually you don't do research alone, there is always a process in a research that takes you further, it needs more people."*)
- Dedicated (*"Because he/she is dedicated."*)

The financial situation of the "typical researcher":

They think it depends on the research topic. A more moderate material prosperity was considered more typical (*"Poor."; "It depends. "; "I know a historian who found meaning in life, you could say, not having much money, barely making a living from all these archaeological finds and excavations, but after finding something, by the age of 40, wrote a book, and suddenly was funded, then getting more money; but at the very beginning when only doing research, one might not be in the same financial situation as he/she is a few years later."; "It all depends on the research topic as well. Maybe someone won't achieve anything in their research, but maybe someone like this archaeologist will, and they'll be recognised in the end."*)

The appearance of the "typical researcher":

It has provoked controversy. Opinions ranged from shabby to very elegant. (*"Elegant."; "Shabby."; "Some people are very elegant and others wear simple everyday clothes."; "For me it is more elegant."; "How they dress depends on what field they are researching."; "The archaeologist and historian I know is quite elegant."; "Manly, modest."; "Well-groomed. Yes, well-groomed."*)

What is most important for the "typical researcher":

Research is a life goal, not just a job (*"Research itself. It's his purpose. It's what he's dedicated his life to"; "Research is the beginning and the goal, it's what he's dedicated his life to"; "To achieve something"; "To achieve results through research"; "He/she has no other goal, whatever is set out to achieve, should achieve it, whatever the field"; "He/she wants a little recognition"; "A Nobel Prize"; "It's usually a warm handshake, a hug or a pat on the back"*)

The behaviour of the "typical researcher":

- An average character in his/her behaviour. He/she is not the centre or the voice of society, but he/she is not on the periphery either. (*"He/she may not stand out, but he/she doesn't close off either. He/she is not the centre, but is not necessarily the most reserved personality. I'd say the person is more average."*)
- Talks a lot in company, but mostly about his/her own research topic. (*"In a company, he/she is happy to talk to anyone."; "And talks a lot."; "About his/her own topic."; "No, he/she is open to new topics, because maybe it has something to do with his/her research."; "But he/she can lead you to his/her own topic."*)
- He/she is a narrow specialist, just doing his/her job. (*"A researcher is always researching, always looking for opinions, always looking for different views on the world, always asking opinions on the subject of his/her preference. "; "He/she is always on the job, does it all the time, and then one day collapses from exhaustion"; "It's the Indiana Jones kind of person, up in the cathedral one minute and out in the field the next, this is the way I could imagine the male researcher, and the female one in the same way."*)
- The satisfaction and happiness of the "typical researcher" depends mostly on how much appreciation he/she receives (*"Happy, yes, because he/she is dedicated, thinks that he/she can achieve a very good goal if he/she can figure something out"; "Yes, he/she considers his/her work as a hobby, doing it with heart and soul"; "I don't think he/she is happy"; "I don't think he/she is happy either."; "Because he/she is looking for what is bad and not for what is good, and for that you need to have a very developed, so to speak, social thinking, so that you can think in a way that you can see what is beautiful in life, and that is not characteristic of scientists, maybe it is characteristic of their professional skills, but not of their social skills, and that is why they tend to see the bad aspects, in the social field they tend to see the bad aspects, precisely because they are not the centre of the company."; "I would say he/she doesn't get enough credit for his/her work. There are very few researchers nowadays, there are a lot of people coming up with new things all the time, but very few that have survived at the level of honours, but they're still improving things all the time, it's just that a lot of people don't get that recognition for it. Even a theoretical one, just the title, that he/she is really considered as a researcher, we've mentioned that the salary is really inadequate."*)

#### **4. VISION: WHAT MAY MAKE RESEARCH ATTRACTIVE FOR GENERATION Z?**

The typical researcher – if he/she cannot make a connection, for example because he or she uses too much jargon – is less charming and interesting. This opinion of university students is well related to what they have experienced in university lectures (*"If he/she is very clever, he/she is not so nice, I mean, he/she uses jargon to address the audience in a lecture, and three quarters of it is not really clear to us because of the jargon used"; "A know-it-all kind of person."; "He/she can say anything, we won't understand that because of the words used."*) Opinions are divided regarding the attractiveness of the researcher lifestyle. It is considered to be personality-dependent, being more attractive for introverts and people who tolerate monotony (*"It depends on the person, if you can tolerate monotony you can be a good*

researcher"; "Some people are so simple and they get by with it, it makes them happy"; "There are a lot of stereotypes about researchers being very introverted and gray people.")

It is unattractive, people with the opinions below would not like to do research work:  
The researcher lifestyle is not attractive because he or she does not feel the necessary dedication to everyday research. For them, it seems to be a tied lifestyle and they think that work does not end when the working hours are over. (*"I certainly wouldn't be one. I'm not that much of a researcher, I can't imagine doing research every day, I wouldn't be that kind of person"; "It's a more reserved way of life"; "The researcher takes work home, never stops thinking; I put the work down when the working hours are over and take care of myself, after the working hours I don't want to be thinking about what else I should look at, what else is there."; "It's a bit more of a tied way of life"; "I'd do it, too, because I like 3D, for example, and I can imagine further development in this technology, researching to make it as good as possible, but I wouldn't want to spend my whole life researching day and night or constantly thinking about it. I want to do other things in my life, too."*)

It is attractive, people with the opinions below would be keen to do research work:

- The researcher lifestyle is attractive for those who like problem-solving challenges (*"Gladly. I like solving problems, if I want to work somewhere I don't want to hate it, I want to do a thing, a job that I like, and let's say if it is problem solving, research, it is something that I like, solving problems, and that's why I'd be keen to do research."*)
- It is diverse, always bringing something new, and researchers are doing what they like. (*"I imagine it to be more varied, this is too typical for me."; "It can be very varied, in a good case they're doing what they like, within that there's always something new, something different to look at or develop."; "Within their work it's varied, there are always new stories."*)

## **5. CONCLUSION, THE RESEARCHER'S CAREER IN HEADINGS ACCORDING TO UNIVERSITY STUDENTS**

Based on the 4 focus groups conducted among university students, the results can be summarised as follows, i.e. this is how young people perceive researchers:

- The typical researcher is a middle-aged male, 40+.
- They are characterised by a sense of commitment to their work.
- They are tidy, curious and passionate, especially about their work.
- Financially, they tend to have a modest existence, but this also depends on how current their research is.
- Their appearance is uncharacteristic, it can be shabby, casual, but very elegant as well.
- For the typical researcher, the most important thing is the success of his/her research and the recognition (professional, moral, financial) that this brings.
- They are average characters who fit in socially but are not the centre of attention.
- They talk a lot about their work, not interested in much else, being specialists.
- Their satisfaction and happiness depend mostly on how much appreciation they receive.
- Overall, they are a kind of "clever sucker."

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## THE ROLE OF DIGITAL MARKETING COMMUNICATION ON THE CONSUMER BEHAVIOR OF GENERATION C

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### **ABSTRACT**

*Internet and rapid development of technology have greatly changed the expectations and needs of consumers. Given the numerous advantages of Internet, consumers increasingly tend to choose and buy products from the comfort of their homes. Digital marketing is increasingly used to promote products and services to meet consumer needs and expectations. Generation C is one of the consumer segments whose members grew up with digital media. This group includes members of all generations whose main characteristic is constant connection via Internet and devices of the latest technology. The aim of this paper is to analyze attitudes on the consumer behavior of Generation C and the role of digital marketing communication in products selection. The obtained results show that Generation C members search for the information about goods and services before making a purchase decision and research reviews of other consumers who have used them and shared their experience on social networks and the seller's website. Generation C members like to share their satisfaction or dissatisfaction about goods or services they purchased in order to warn others about its shortcomings. Generation C lives in a digital age where sharing post-purchase experiences is easy and at the same time useful for future consumers.*

**Keywords:** consumer behaviour, Generation C, digital marketing communication

### **1. INTRODUCTION**

The digital age and e-marketing greatly influence consumer behavior. The appearance of online stores made it possible to shop with almost one click, while on the other hand, social networks made it possible to advertise products and services to a target group of consumers. Information spreads quickly through social networks, so consumers share their post-purchase experience with other social network users or seek additional information and experiences from others before making a final purchase decision. Generation C as one of the consumer segments, whose members grew up with digital media. Generation C is looking for new content every day, and their decisions are based on online content. Therefore, many brands have focused their marketing activities on content marketing. Members of Generation C share their experiences not only with friends, but with all users on social networks. Generation C has an ingrained need for research and development, while accepting new technological developments that result in a pronounced tendency to change. The main objective of this paper is to analyse attitudes on the consumer behaviour of Generation C and the role of digital marketing communication in products selection. The answers of 208 respondents were collected through a survey questionnaire in the period March-August 2022.

This paper is organized as follows: after the introduction, the second section deals with an overview of the most popular social networks. The third section focuses on marketing management on social networks. Section 4 presents the consumer behaviour and Generation C. Section 5 describes the used methodology and sample, while Section 6 presents empirical results from the study. In the last section conclusions are given.

## **2. SOCIAL NETWORKS**

Social media have become channels for communication and obtaining information that users prefer over other online platforms, such as websites, blogs, forums. Social networks have become one of the biggest revolutions in human communication, and an increasing number of people use them every day. A social network can be defined as "a web-based service that allows an individual to create a (semi-)public profile within a limited system, articulate a list of other users with whom he shares connections, and see and compare his contact list with those created by other users within the system". (Grbavac and Grbavac, 2014). Digitization has enabled producers to get closer with their consumers, who nowadays spend more and more time on social networks. The most popular social networks are Facebook, Twitter, Instagram, YouTube and TikTok. Facebook is used to post photos that encourage other online users to comment and communicate (Grbavac and Grbavac, 2014). Facebook's success can be attributed to its ability to attract both consumers and producers to simply create a profile on this social network. Instagram is a free app for sharing photos and videos. People can post photos or videos and share them with their followers or with a select group of friends. They can also view, comment and like posts shared by their friends on Instagram. Some of the advantages of using Twitter in business are: constant connection, free business promotion, attracting new customers, communication, experimenting with tone (Business, 2022). YouTube is a huge video sharing platform that allows users to watch, like, comment, share and upload videos. With approximately 1.9 billion monthly visits, YouTube is the second most visited site in the world, and is also the second largest search engine, behind Google (Tafesse, 2020). The content is free for all users, as this video viewing channel derives most of its revenue from marketing, and has seen steady growth with the rapid expansion of mobile devices (Duffett, 2020). One of the benefits of YouTube advertising in the launch phase of new products and services is influencers, celebrities endorsing products, as well as YouTubers which are effective in reaching young consumers (Duffett, 2020). TikTok has attracted users from all over the world, giving different types of businesses the opportunity to collaborate with influencers. TikTok is also used for brand promotion (due to reduced costs, more and more users are using TikTok for product branding) and for influencer marketing which has proven to be one of the basic techniques used by marketing experts to attract audiences (Choudhary, Gautam and Arya, 2020). It is no surprise that brands are replacing traditional marketing methods and investing more money in social media marketing as social media has become an extremely important part of consumers' lives. Social media advertisement has become unavoidable.

## **3. MARKETING MANAGEMENT ON SOCIAL NETWORKS**

Today, the Internet enables the availability of information at any place and any time influencing different decisions. Technological progress has caused a faster movement of goods on the market, a higher pace of products production and consumption, and the emergence of Internet shopping which has become an everyday occurrence. The increasing usefulness of the Internet has led many companies to adapt their business strategies to digitization and direct their marketing efforts to social networks. Ease use and communication on social networks has enabled consumers to share their opinions about goods and services, or brands they have consumed. Social networks, which are used by millions of users, have become a channel that transmits word-of-mouth information at an enormous speed, thus creating a series of positive



and negative information about goods and services. The increasing engagement of users online makes social media the perfect place to gather opinions of those who matter most – consumers. It is the reason that social networks are increasingly used for business purposes to collect informal feedback from customers, and to interact with potential customers to let the organization know that it cares about the opinions of its consumers. In order to achieve their goals, organizations use various forms of marketing: content marketing, viral marketing, e-marketing and mobile marketing. Content marketing reflects a company's or brand's true promise to create value for (potential) customers through the offering of relevant or free content, and aims to build long-term relationships with consumers, relying on consumers' proactivity to seek brand content which is worth the effort (Lou and Xie, 2020). Content marketing is created and shared by the company itself, and the fundamental difference between the mentioned form of marketing and traditional marketing is that the content focuses on the interest of the consumer and not on selling the product. Content marketing can be described as a strategic marketing approach aimed at creating and distributing valuable, relevant and consistent content that will attract and retain a clearly defined audience and ultimately, drive profitable customer action. Viral marketing is also called World of Mouth Marketing, Buzz Marketing, or just Buzz. This type of marketing implies the voluntary transmission of a promotional message by the users themselves (Stanojević, 2011). The rapid growth of the Internet and the use of Internet commerce have made viral marketing an attractive marketing method for most companies and marketers, but first of all, the factors that influence the attitude of customers towards this form of marketing should be investigated. Viral marketing consists of targeting specific consumers to encourage faster product adoption. The selection of influential consumers is not random, but a complex process of optimization that includes the analysis of the social network of consumers in order to achieve the maximization of influence, thus favoring the spread of positive information (Robles, Chica, and Cordon, 2020). Viral marketing includes any strategy that persuades individuals to convey a marketing message to others, and builds the potential for exponential growth in message delivery. Like viruses, such strategies use rapid replication to spread the message to potential customers. In other words, viral marketing implies that the consumer has the function of electronic word of mouth on social networks and media (Hendijani Fard and Marvi, 2019). Attractive messages are passed on, but it is not easy to encourage consumers to spread them. Such messages should be fun or intriguing, linked to products that are easy to use, well targeted, linked to a credible source, combined technologies (Dobele, Toleman and Beverland, 2005). One of the advantages of viral marketing in relation to traditional mass media campaigns is the ability to target a specific group of customers, and this is achieved in many cases through a network of friendships because it is assumed that they share common interests. This kind of customer acquisition strategy has more influence and acceptability of third-party advertising among potential customers because it comes as a recommendation from a friend (Bhattacharya, Gaurav and Ghosh, 2019). Kotler and Armstrong (2012) described e-marketing as marketing that uses various online electronic media, while Fang and Lie (2006) called e-marketing marketing using web media and various related transaction activities that consumers can easily access. E-marketing creates fundamental attitudes and behavioral changes of consumers who buy online, therefore they are influenced by e-marketing (Priansa and Suryawardani, 2020). E-marketing can also be defined as "the achievement of marketing goals through the use of information and communication technology" (Stanojević, 2011). One of the advantages of using e-marketing is small investments, therefore it is most often used by smaller companies that have a limited budget for the promotion of products and services. Life without mobile phones has become unimaginable. People became its regular users, which resulted in the emergence of mobile marketing, which developed into a powerful tool for attracting potential customers.

There is more and more research on the usefulness of mobile marketing, and the availability of various research results allows companies to design appropriate marketing strategies and set up targeted campaigns. The mobile phone has also influenced the way sellers communicate with customers, thus creating new marketing opportunities. This form of marketing enables the personalization of advertisements, in order to show potential customers only relevant information and personalized content, which is the opposite of mass marketing, which is used to promote goods and services in such a way that only one advertisement is created for all customers and various promotion channels. The Internet has provided better insight into consumer behavior, and many companies use it to target only potential customers. Mobile marketing can be divided into two categories (Golob, 2016):

- push mobile marketing where the consumer is sent content that he did not ask for, such as audio messages, messages, e-mail, surveys and similar content.
- pull mobile marketing, where the consumer is sent a one-time content request, as well as promotional messages for network users who have chosen that option.

#### **4. CONSUMER BEHAVIOR AND GENERATION C**

Consumer behavior can be defined as "the process of obtaining and consuming goods, services and ideas from a consumer unit. It also includes post-sale processes that include evaluation and post-purchase behavior. It should be noted that the consumer unit means an individual or a household that makes a decision. It can also be an expert group in the company" (Kesić, 2006). Another definition defines consumer behavior as "a series of psychological and physical activities undertaken by an individual or household in the process of selecting, purchasing and consuming goods and services." In order to determine the consumer's motives and wishes, it is necessary to understand three roles in consumer behavior: the role of the goods and services user, the role of the payer and the role of the customer, and the characteristics of the product must be adapted to the requirements and expectations of the user/consumer of the product" (Previšić and Ozretić Došen 2007). Considering the definition that states that consumer behavior is a process, three phases of consumer behavior can be distinguished: purchase phase, consumption phase and the storage phase (Kesić, 2006). In the first stage, various factors influence the decision to purchase goods or services. In the second phase, the very act of consumption and the satisfaction or dissatisfaction that occurred after consumption are analyzed, as this will affect the future behavior of the consumer. In the third phase, the consumer decides how to use the product remains, which is of great importance for environmental protection. It can be concluded that the analysis of consumer behavior through all three phases is important for advertising to brands that want to adapt their products to the needs and wishes of potential consumers, i.e. the way they make decisions, the way they consume and recycle leftovers. Monitoring of trends that also affect changes in consumer behavior is of great importance, and every individual as a consumer is influenced by numerous factors and concepts that shape his consumer behavior.

##### **4.1. Specifics of Generation C**

Generation C is made up of passionate consumers and brand advocates, and when they become brand loyal, they become the biggest spenders, and increasingly they are seen as the most influential content creators on social media. They are connected, communicating, content-driven, computerized, community-oriented, always clicking. Although they are not classified by age group, as a rule, they were born after 1990, and they experienced adolescence after 2000. Their lifestyle has been influenced by the Internet, mobile devices and social networks (Friedrich, Peterson and Koster, 2011). It can be concluded that this generation is best acquainted with the advantages offered by technology because they use various devices that facilitate their communication and shopping.

They rely on information shared on social media, and use social networks to stay in touch with friends, family, business contacts, and people with the same or similar interests.

#### **4.2. Products selection method of Generation C**

Generation C bases its decisions before purchasing products on recommendations and experiences shared by other consumers. They tend to browse websites and social networks to find out information about products they intend to buy, and they expect reliable content created by brands and other consumers. This generation summarizes the special behavioral characteristics of the previous generations X and Y. This generation is not only made up of consumers of a certain age group, but a group of consumers with similar characteristics. It is characterized as a generation that emphasizes content creation (Hardey, 2011). Each generation behaves differently from another generation. Generation C is looking for a brand that contributes to the world and is committed to benefiting the planet to make it a better place to live. They trust companies that have a positive impact on the wider community, and will choose brands that will help them create positive effects on society. As consumers, it is important for Generation C to feel positive, i.e. that they are valued, cared for, reliable, focused, safe and satisfied. They are loyal and ready to recommend the brand to their family or friend (Helmi, 2017). It can be concluded that the post-purchase experience is the key to creating competitiveness, loyalty and sharing recommendations, and results in a differentiation value compared to other brands, which will make members of Generation C repeat the purchase if they create positive feelings after the purchase.

#### **5. METHODS AND SAMPLE**

A survey questionnaire was created to collect data on the attitudes of respondents belonging to generation C in order to show the impact of digital marketing communication on consumer behavior. The questionnaire was available in the period March-August 2022 on the social networks Facebook and Instagram, as well as on the WhatsApp, Viber and Messenger applications. A link to the survey questionnaire was also sent by e-mail. In this research 208 respondents participated. According to the age structure, the most respondents are between 18 and 30 years old (46.6%). Females predominated (62%). According to the educational structure, the majority of respondents have secondary education and higher education (50%). The largest number of respondents earns a monthly income between HRK 7,000 and 10,000 (46.2%). Selected descriptive statistical indicators were calculated and interpreted for quantitative variables.

#### **6. RESULTS**

The conducted survey aimed to analyze attitudes of respondents on the consumer behavior of Generation C and the role of digital marketing communication in products selection. Respondents evaluated their attitudes on a five-point scale, ranging from 1 (poor) to 5 (excellent).

In order to determine whether Generation C members seek the experiences of other consumers before making a purchase decision, the following variables were defined:

- 1) How often do you look for the experiences of other consumers on social networks before making a purchase decision (V1)?
- 2) To what extent do you think that quality and optimized content published on social networks is important for attracting new and retaining existing consumers (V2)?
- 3) To what extent does feedback about products and services on social networks influence your final purchase decision (V3)?
- 4) Do you consider feedback about goods and services on social networks relevant (V4)?

- 5) Will you buy a good or service if you don't find any feedback about it (V5)?
- 6) How often do you buy new goods or services without asking for feedback from other consumers (V6)?

Variable	Mean	Std. Deviation	t-test
V1	3,78	0,992	54,922
V2	4,08	0,881	66,719
V3	3,90	0,943	59,705
V4	3,69	0,912	58,366
V5	3,22	1,137	40,841
V6	3,21	1,164	39,775

*Table 1: Respondents' attitudes on the experiences of other consumers before the purchase decision*  
 (Source: Fišter (2022))

According to the results presented in Table 1, respondents showed the highest degree of agreement regarding the importance of quality and optimized content published on social networks for attracting new and retaining existing consumers and regarding the influence of feedback about goods and services on social networks. With somewhat lower average ratings, respondents evaluated the purchase of the product without finding feedback and without seeking feedback. The calculated indicators related to respondents' attitudes about the experiences of other consumers before the purchase decision support the hypothesis that Generation C members look for the experiences of other consumers before the purchase decision. Internet and social networks enable consumers the opportunity to search for information about goods and services before making a purchase decision, and to research reviews of other consumers who have used them and shared their experience on social networks and the seller's website.

In order to determine whether Generation C members easily share satisfaction and dissatisfaction after a purchase, the following variables were defined:

- 1) How often do you share your satisfaction or dissatisfaction with a purchased good or service on social networks to share your experience with consumers (V1)?
- 2) Do you think it is important to share dissatisfaction with the purchased product in order to warn potential customers of its shortcomings (V2)?
- 3) How often do you visit social networks just to share your own satisfaction or dissatisfaction with the purchased product or service (V3)?
- 4) Do you think that it is easier to share dissatisfaction after a purchase than satisfaction (V4)?

Variable	Mean	Std. Deviation	t-test
V1	3,12	1,175	38,284
V2	4,03	1,009	57,652
V3	3,13	1,170	38,571
V4	3,55	1,154	44,354

*Table 2: Respondents' attitudes on sharing satisfaction and dissatisfaction after purchase*  
 (Source: Fišter (2022))

According to the results in Table 2, it can be concluded that Generation C members like to share their satisfaction or dissatisfaction with others.

Considering the highest average ratings, it is important for them to share their dissatisfaction with the good or service in order to warn others about its shortcomings. Nowadays, digitally sharing post-purchase experiences is easy and highly beneficial for future consumers.

## 7. CONCLUSION

Digital marketing communication enabled easier communication between brands and consumers, which for Generation C members is of great importance when choosing a product. Consumers are increasingly using digital information that influence their consumer behavior. Most of those information is unverified, although consumers select from the set of information only the information they want and the way they will consume it. The availability of information in real time, the location of people, and the many channels that enable fast communication regardless of time and place, attract users to use them more and more often because in this way they stay connected, share interests and recommendations with others, and create buying habits. All of this could fall into the background if consumers feel that their privacy and security of personal data has been violated. By creating numerous profiles on social networks, users share their personal data, interests and leave traces that reflect their consumer behavior, thus unwittingly creating a huge database available to brands that makes it easier for them to adapt advertising strategies to the target group of consumers with regard to their characteristics.

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## CHANGES IN THE SECTOR OF SMALL AND MEDIUM-SIZED ENTERPRISES IN THE REPUBLIC OF CROATIA UNDER THE INFLUENCE OF THE PANDEMIC

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### ABSTRACT

*The incredible change in the dynamics of the environment and the complexity of the surroundings significantly affect companies business operations worldwide, including companies in the Republic of Croatia. The changes caused by the pandemic are visible in all sectors, especially in small and medium-sized enterprises. Entrepreneurship is the foundation that drives national and global economies. In the Republic of Croatia, the sector of small and medium-sized enterprises accounts for over 50% of the total income at national level, and annually employs over 70% of the total number of employees. Therefore, the development of a good state entrepreneurial climate is unquestionable and needs to be backed up with the effective legislative and institutional framework. The fact is that the contribution of Croatian educational system in developing entrepreneurial competences is rated below the European Union average, which significantly affects the competitiveness of the companies, and thus the economy as a whole. The European Union has recognized the trends that modern entrepreneurship demands, and directs most of its support to the small and medium-sized entrepreneurship segments, therefore Croatia as a member implements and redirects activities of its institutions and supports entrepreneurship whose activities have been expedited due to the pandemic. Based on that, the aim of the paper is to provide an overview of the institutional framework in the Republic of Croatia, which is the key in providing support and development of entrepreneurship in the state. Further, an overview of the environment and changes caused by the pandemic in the sector of small and medium enterprises in 2019 and 2020 has been given. Secondary data sources were used in writing the paper.*

**Keywords:** entrepreneurship, SME, pandemic, corona crisis, Croatia

### 1. INTRODUCTION

Global pandemic 2020 caused overall disturbances which deeply affected all business sectors and the losses are still visible. The crisis, never seen before, disrupted trade, investment, and employment (Fitriasari, 2020) and the most affected have been small and medium sizes companies (SME) due to liquidity problems and dependence on certain markets. Pandemic affected the most sectors of Accommodation & Food Services, Arts, Entertainment & Recreation, Education (Kalemli-Ozcan et al, 2020). The SME sector is extremely popular in today's economy. According to the results of the research, the majority of Croatian economy as well as the European Union is made up SME enterprises. In Croatia, according to the Accounting Law the category of small companies includes companies whose number of employees does not exceed fifty employees, while medium-sized companies are considered

companies that have two hundred and fifty employees during the business year. Small and medium-sized enterprises mostly operate in the local, regional and national space. Nowadays, the growth and popularity of SME businesses is a consequence of the progress of IT and information technologies. Digitalization and digital transformation allows SME sector to be competitive on international markets. In the developed world, there is a growing trend of substitutes that are offered on the market at lower prices. Namely, it is very common to buy products from well-known manufacturers to unknown manufacturers. Such a trend favors the development of a small economy and its global market expansion. The advantages of a small business are innovation, knowledge of the market and creativity. Small businesses are very popular among entrepreneurs because there are no high barriers to entry and no excessive initial investment is required. Also, it is easier to focus on a smaller group of customers than on a mass of people, i.e. consumers. Within a small business, there is retail and wholesale. Retail, due to the ease of establishment and the quick acquisition of experience, attracts many entrepreneurs. Therefore, many governments around the world have imposed certain measures to address the problems SME sector faced due drastic decrease of liquidity in order to diminish drastic consequences and ensure recovery of SME sector.

The desk approach was used in this research to address the impact of pandemic on SME sector in Croatia.

## **2. INSTITUTIONAL FRAMEWORK FOR ENTREPRENEURS IN CROATIA**

According to the Law on improvement of business infrastructure, entrepreneurial infrastructure in the broader sense of this Act represents the totality of all spatially specific forms of development of various entrepreneurial activities resulting from a well-thought-out and organized spatial development concept of local and regional self-government units. Further in a narrower sense it includes entrepreneurial zones and entrepreneurial support institutions within the Croatian territory (Zakon o unapređenju poduzetničke infrastrukture, NN 93/13, 114/13, 41/14, 57/18, 138/21). Those institutions stimulate and develop the economy (Ministry of Economy and Sustainable Development, Croatian Agency for Small Business and Investments, Croatian Bank for Reconstruction and Development, Croatian Chamber of Commerce, Croatian Chamber of Crafts and European Funds), and provide entrepreneurial support institutions (entrepreneurial centres, entrepreneurial zones, entrepreneurial incubators, business parks, technology parks, development agencies and competence centres). Despite the persistent work of large institutions to encourage the development of the Croatian, this is not enough. Therefore, there are also entrepreneurial support institutions that have faster access to regional and local entrepreneurs and provide the necessary support. They are defined as business entities that apply programs oriented towards the development of entrepreneurship and a stimulating environment in entrepreneurship (Ministry of Economy and Sustainable Development, <https://mingor.gov.hr/o-ministarstvu-1065/djelokrug/uprava-za-internacionalizaciju-6087/poduzetnicka-infrastruktura/7583>). According to the data obtained through the research of the Unified Register of Entrepreneurial Infrastructure in 2020, 496 institutions offering services to the small and medium business sector were registered in Croatia. The purpose of the activities of supporting institutions is to contribute to strengthening the competitiveness of SME, attracting new investors, reducing unemployment by opening new jobs, encouraging innovation and the use of new technologies (CEPOR report, <https://www.cepor.hr/wp-content/uploads/2015/03/CEPOR-Mala-i-srednja-poduze%C4%87a-u-HR-u-vrijeme-pandemije-COVID-19.pdf>). Entrepreneurship centres are centres of professional and educational assistance to entrepreneurs for the operational implementation of measures that encourage the development of entrepreneurship at the local and regional level.



According to legal provisions, entrepreneurial centres supervise the development of entrepreneurship, the connection of entrepreneurs, the internationalization of business, and the growth and development of business entities. As places of professional and educational assistance, they are being developed in all municipalities, cities and counties in Croatia. They base their information system on the model of practice in developed countries.

## **2.1. Entrepreneurial zones in Croatia**

The founders of entrepreneurial zones according to the mention Law can be individuals legal entities or a consortium composed of; The Republic of Croatia independently or in cooperation with local and regional self-government units and bodies or other legal entities, local and regional self-government units and bodies universities, scientific institutes and scientific organizations or other legal entities based in the Republic of Croatia that are registered for activities that improve the development of entrepreneurial infrastructure and/or that deal with and/or promote research, innovation and technological development in the business sector (Zakon o unapređenju poduzetničke infrastrukture, NN 93/13, 114/13, 41/14, 57/18, 138/21, act 5, point 2). Entrepreneurial zones are special areas intended for carrying out various economic activities. The basic purpose of entrepreneurial zones is the joint use of infrastructure-equipped space within the zone, which greatly helps entrepreneurs in streamlining their operations. Entrepreneurial zones provide entrepreneurs with various benefits such as reduced utility contributions, the possibility of selling land with deferred payment and lower land prices. The goal of entrepreneurial zones is to improve the operations of existing entrepreneurial entities, attract investors and foreign entrepreneurs, support new entrepreneurial ventures, increase employment and reduce the lagging behind of the Croatian economy. According to the activity type they can be: (1) production - processing zones, (2) logistics - distribution zones, and (3) service mixes zones (Zakon o unapređenju poduzetničke infrastrukture, NN 93/13, 114/13, 41/14, 57/18, 138/21, act 8). Croatia has unified electronic register of business infrastructure where information about entrepreneurial zones and support institutions can be found. The support system for entrepreneurial zones is organized for infrastructure grants, grants for strengthening competitiveness, and grants for strengthening entrepreneurial competences. While the support system for entrepreneurial support institutions is organized in form of grants for the preparation of projects, grants for capacity building, support for improving the quality of services, and also grants for strengthening entrepreneurial competences.

## **2.2. Support institutions in Croatia**

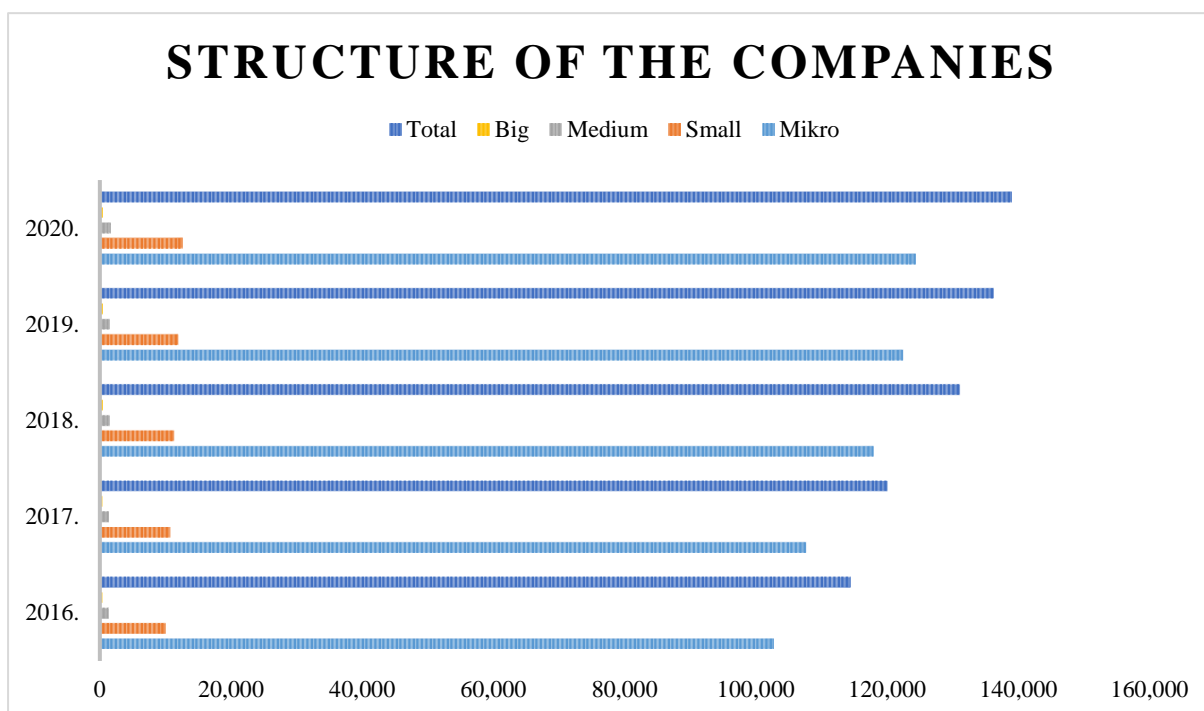
Entrepreneurial support institutions as part of the overall entrepreneurial infrastructure is structured as follows: development agencies, local development agencies, county development agencies, development agencies of certain activities, entrepreneurship centres, business incubators, entrepreneurial incubators, incubators for new technologies, entrepreneurial accelerators, business parks, scientific and technological parks, and centres of competence. Development agencies are responsible for the operational implementation of measures for the development of the economy and entrepreneurship at the local (regional) and national level. They attract investments, initiating and implementing projects to encourage economic development and entrepreneurship. Further development agencies of certain activities are specific agencies for specific purpose and they are established by local or regional government bodies. Entrepreneurship centres represent centres of professional and educational assistance to entrepreneurs for the development of entrepreneurship in the areas where they are established (local or county, region). Business and entrepreneurial incubators are places where new entrepreneurs gather who are just entering the world of entrepreneurship. They represent a form of support that serves to facilitate business for new entrepreneurs in the early stages of business.

Users who meet the necessary conditions are given the technical and financial assistance that every beginner entrepreneur needs to develop their business and survive on the market. Services such as administrative services, accounting and professional assistance are also available within the incubator itself. The period of providing assistance and support to beginning entrepreneurs is from the first to the third year of operation. Business parks are parks whose activity is based on attracting domestic and foreign investors. Users of business parks have the option of using business premises at reduced prices. In Croatia, in 2019 and 2020, one business park was registered, the headquarters of which is located in Darda. Further incubators for new technologies represent specialized business entities with a thematic focus and focus on areas of new (high) technology that supports the start-up and growth of innovative entrepreneurship through incubation programs. Also provides resources and professional services necessary for the growth and development. Entrepreneurial accelerators provide supporting services to entrepreneurs in the post-incubation phase. Scientific - technological parks represent small business zones and provide services for long-term solutions to the needs of entrepreneurs for business premises and offer shared use of infrastructure. In technology parks, experts and entrepreneurs collaborate in the realization of economic goals whose business is based on new technologies. Technological parks, in contrast to business parks whose activities are focused on production and business, put scientific and research activities first. For this reason, they are generally positioned near research centres and higher education institutions and attract young talented experts and top experts. Through their work, development agencies promote and implement projects aimed at influencing the development of the economy at the county and local level. These are legal entities whose work is regulated by the Law on Regional Development of the Republic of Croatia and are established by local governments or regional governments. Competence centers focus their work on applied and development research and on the commercialization of their results. They develop skills through education and research projects and are funded through grants. The goals of the centres are to strengthen the innovation environment, increase the number of research processes and develop the business sector. The work of competence centers must be harmonized with the conditions of the Smart Specialization Strategy of the Republic of Croatia (Zakon o unapređenju poduzetničke infrastrukture, NN 93/13, 114/13, 41/14, 57/18, 138/21).

### **3. THE IMPACT OF PANDEMIC ON SME SECTOR IN CROATIA**

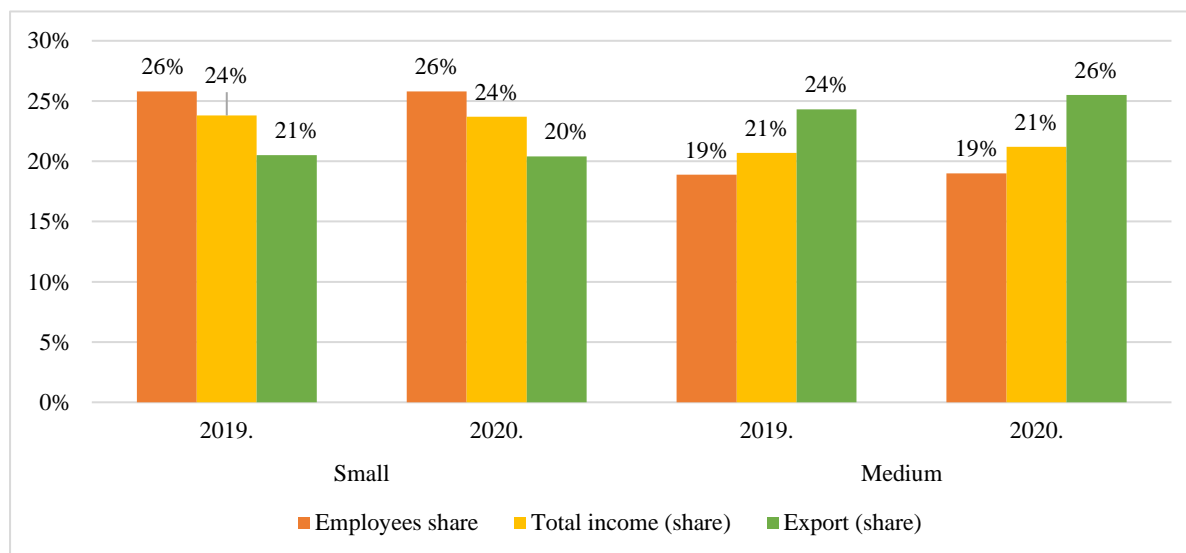
The last report on SME was issued under the title "Small and medium-sized enterprises in Croatia in the conditions of the COVID-19 disease pandemic", released in 2021 analyse changes that pandemic brought in . All the changes that occurred in the sector of small and medium enterprises as a result of the pandemic in 2020 and partially in 2021. This report analyses financial indicators in sector of SME in Croatia. In regards to 2020, there has been an increase of registered companies in 2021 in Croatia by 21%. At the first site, the pandemic did not negatively influenced on opening of new businesses. This can be seen in graph 1 where there is seen a constant increase of the total amount of companies in a 4 year period. Form the graph 1 it can be concluded that micro, small and medium-sized companies lead the Croatian economy.

*Graph following on the next page*



*Graph 1: Structure of companies in Croatia from 2016 till 2020 according to size  
 (Source: Author's own elaboration based on CEPOR report)*

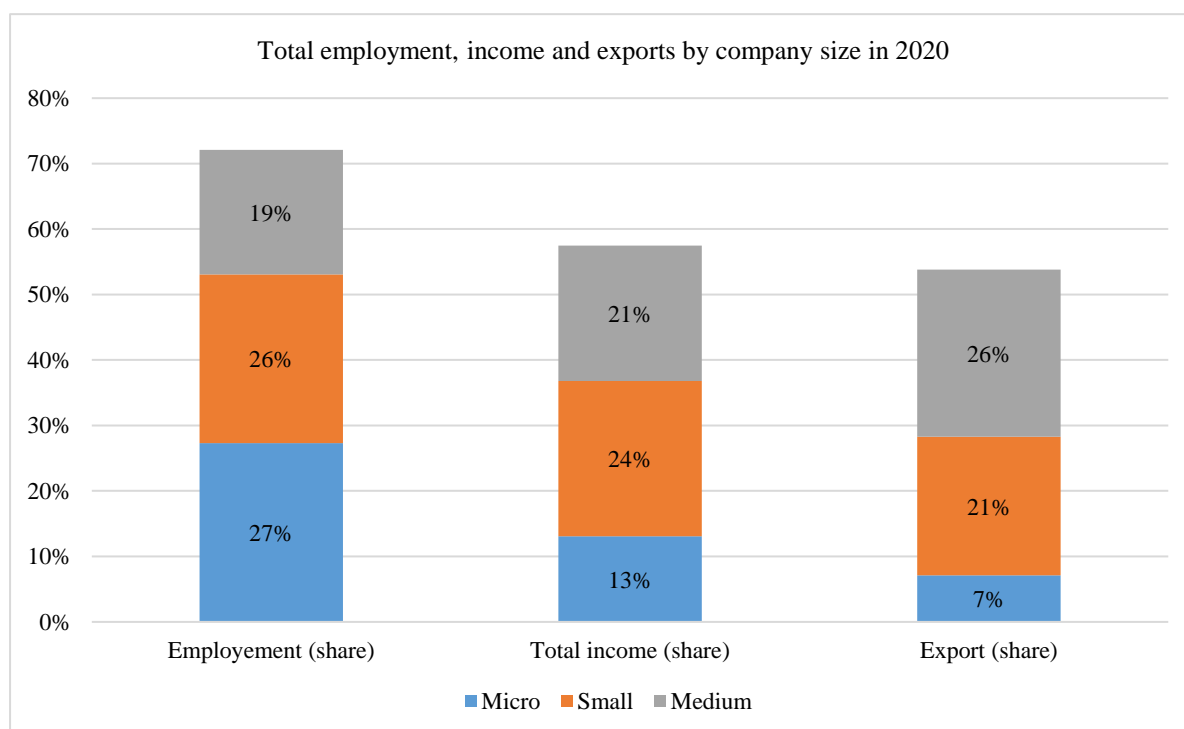
However, the entire business sector ultimately shows the negative consequences left by the COVID-19 pandemic. From the graph 2 it is seen that the number of employees and total income of companies did not increase in 2020, but was left on the same level as in 2019. Only the export share increased by 2% in medium sized companies. The export of small companies fell by 1% in 2020.



*Graph 2: The SME sector indicators: share of employees, total income and export in 2019 and 2020  
 (Source: Author's own elaboration based on CEPOR report)*

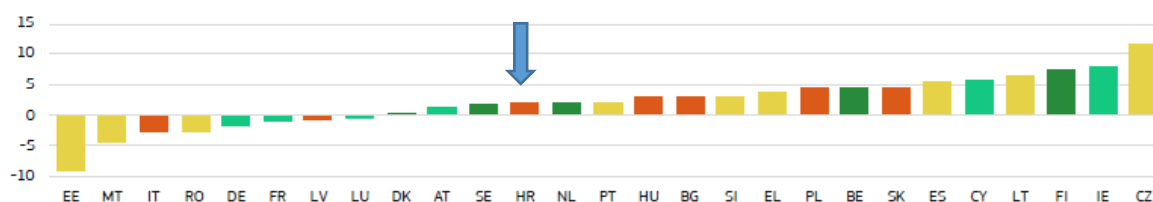
The total number of employees in the SME sector in 2020, was 72% with 58% of the total income and 54% of the total exports realized at the level of Croatia.

Compared to 2019 (graph 3), the sector of SME employed 74% of all employees, had a 60% share in total income and a 53% share in exports (CEPOR, 2021). From this comparison we can state that COVID-19 increased the Croatian export but total income decreased as well as the employment rate (CEPOR, 2021).



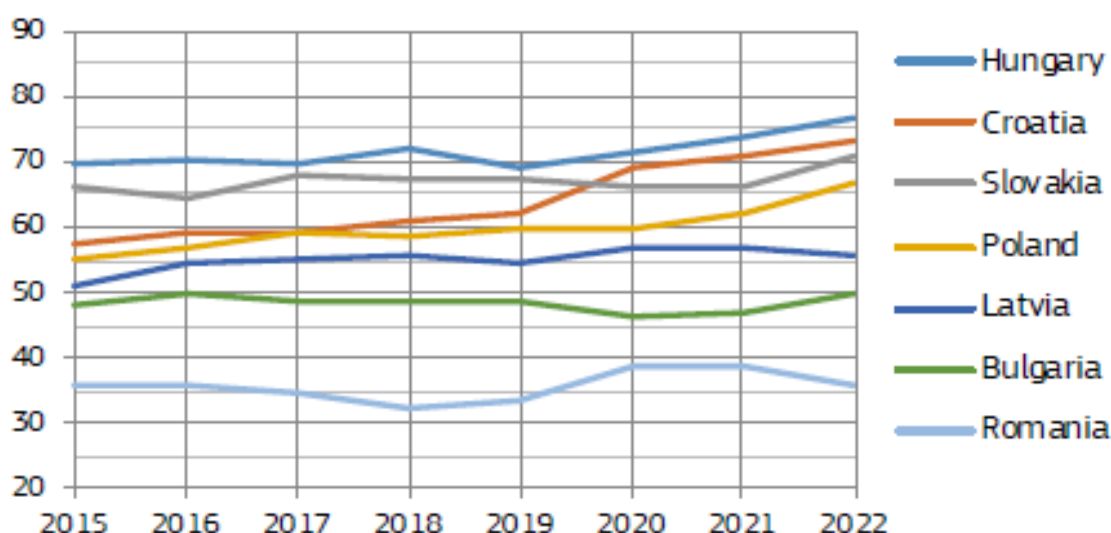
*Graph 3: Total employment, income and exports by company size in 2020*  
 (Source: Author's own elaboration according to CEPOR report, 2021, p. 19)

Further, when we analyse the financial efficiency of Croatian economy, in 2020, the Croatian business sector achieved a positive consolidated result, but a smaller one by almost 33% compared to 2019. This was the result of a decrease in total profit in 2020 year by 6% with a simultaneous increase in total losses by 42% compared to the previous year (CEPOR 2021, p. 19). Further pandemic influenced on the decrease in the number of legal entities, that is 22% less than in 2019. When addressing SME sector in Croatia and its productivity we have to analyse also the innovativeness of SME companies in Croatia comparing it with the innovativeness of other EU countries. In order to measure countries increase in innovation activities, EU has developed the European Innovation Scoreboard. According to this scoreboard countries are grouped into 4 categories that is performance groups: emerging innovators, moderate innovators, strong innovators, and innovation leaders (European Innovation Scoreboard, 2022, p.7). Countries that are grouped into emerging innovators and moderate innovators fall below the EU average regarding performance. While, strong innovators and innovation leaders are above the EU average performance (European Innovation Scoreboard, 2022, p.7). Croatia belongs to the lowest performance, that is emerging innovators group together with Bulgaria, Hungary, Latvia, and Poland. In EU, the performance has increased by 9.9% between 2015 – 2022, and Croatia increased by 15.5% in the same period (European Innovation Scoreboard, 2022 p. 23). This growth represents faster growth than the EU average growth. There are other countries who in the same period increased their performance at a slower rate (from 0 to less than 15%). As concerning the rise of performance in 2021, 19 member countries have achieved performance growth. In the same period, Croatia has increased less than 5% while for example France or Italy have recorded negative growth rates (picture 1).



*Picture 1: Performance Change between 2021 and 2022*  
 (Source: European Innovation Scoreboard, 2022, p. 24 )

Picture 2 represents the group of countries that belong to Emerging innovators where leading innovator in this group is Hungary. Croatia takes a 2<sup>nd</sup> place with continuous increase from year 2015. In this group only Croatia and Poland noted performance increase above the EU average. Croatia had the highest annual increase in 2020 (7.0%) due higher performance of SME sector in product innovations (European Innovation Scoreboard, 2022 p. 26). For example Hungary who is a leading innovator in this group had a decrease in performance, 2017 and 2019, however a strong increase had in 2022 due business process innovation and rise of employment in companies that are innovators (European Innovation Scoreboard, 2022 p. 26).



*Picture 2: The group of Emerging Innovators*  
 (Source: European Innovation Scoreboard, 2022, p. 26)

In regards to 2021, Croatia has a strong increase of further performance dimensions; broadband penetration, venture capital expenditures and public-private co-publications. However in the same period it has a strong decrease of non-R&D innovation expenditures, environment-related technologies and product innovators and represents a performance at 66.5% of the EU average (European Innovation Scoreboard, 2022 p. 58). In term of weaknesses, the report highlights government support for business R&D, environment-related technologies, design applications, innovation expenditures per employee and knowledge-intensive services exports and strengths are; public-private co-publications, product innovators, people with above basic overall digital skills, business process innovators and enterprises providing ICT training. Further the Global Entrepreneurship Monitor - GEM researches the innovation SME companies based on two criteria: product innovation on national and global level, as well as innovative technologies/procedures used in the production of innovative products.

In 2019 and 2020, Croatia is above the average of EU countries included in the GEM survey and slightly above the average of countries with a high level of gross domestic product per capita. Croatia significantly improved their positioning in terms of innovative products and technology on the international market in 2020. Croatia's positioning in terms of innovative products and technology on the international market was weaker in 2019 (place 17/33), but it improved significantly in 2020 (place 11/30) (Singer et al. 2021, p. 36). According to the Global Innovation indeks for 2021, Croatia ranks 42nd out of 132 countries where regarding to the innnovation pillars it best performs in infrastructure (ranking 31/132), while the worst performance are ranked institutions (77/132). Human and capital research pillar (46/132), business sophistication (46/132), and knowledge and technology output (45/132) are ranked pretty much the same. Creative outputs pillar is ranked as 39/132, and market sophistication at 56/132 (Global Innovation Index 2022, p. 50).

#### 4. CONCLUSION

An overview of the Croatian economy indicates that Croatian economy lies on the performance of SME sector, and efforts are being made to improve the economy in these segments. Numerous institutions for the growth and development of entrepreneurship, precisely by implementing and establishing various measures, strive to improve the Croatian economy. However, Global Innovation index has ranked institutions in Croatia at place 77 out of 132. Precisely this pillar has to be improved in order to generate efficient and effective economy development in future years. For example, Switzerland has the most high-performing institutions ranked 2<sup>nd</sup> in the world and produces high output compared to other high incomes countries. Improving the economy and SME would mean increase of innovations, the creation of new jobs, the establishment of new companies and further development of existing ones. Also, the Croatian economy would be more competitive than it is currently, and it would enable SME to access international markets on a larger scale. Namely, the bureaucracy is still quite demanding in most cases, which distracts new investors, foreign investors and young and creative potential entrepreneurs. Also, development of more contemporary education system for entrepreneurs in line with current trends and needs of entrepreneurs would generate new business ventures.

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# **ANALYSIS OF THE GLOBAL INNOVATION INDEX OF THE REPUBLIC OF SERBIA IN THE CONTEXT OF IMPROVING THE NATIONAL INNOVATION AND ENTREPRENEURIAL ENVIRONMENT**

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## **ABSTRACT**

*The subject of the paper is the phenomenon of types, characteristics, financing and importance of innovation for the modern micro and macro environment, which are a pillar for the development of the Global Innovation Index (GII) in the context of improving national innovation policies. The dominant factor for national economic growth is the development of innovation. The pillars of the GI are a vital phenomenon that shows the desire of a country to innovate and prosper, the effect of attempts to make progress and shortcomings that need to be corrected. GI is accepted as the main determinant of national innovation policies of countries, which is measured every year and on the basis of which countries are evaluated and gain insight into their performance on an annual basis compared to other countries and compared to previous years. The paper uses an overview of the literature of the ruling attitudes on this issue, as well as an analysis of the innovation index of the Republic of Serbia with the aim of visibility of the strengths and weaknesses of the innovation policy of the Republic of Serbia.*

**Keywords:** *GII, innovations, entrepreneurship, Republic of Serbia*

## **1. INTRODUCTION**

Living in the period of globalization means, in the economic world, following the trend and being in trend, understanding its dynamics and the dynamics of the market that is expanding and changing very quickly, often creating an environment that requires new things. Big economies, economies in transition, and small ones, all of them in some way strive to be better, to be in line with the trend, to follow the competition and to survive for the sake of their people, their culture and ultimately their country. The importance of innovation for national innovation policies is the most important segment and center of development of any economy. Realization of innovative activities within an economy, the degree of effectiveness of the national innovation system determines the strength and power of state competitiveness. In order to have a strong innovation policy, it is necessary to create such an environment that it really encourages the creation and implementation of innovations. Entrepreneurship development, insistence on investment in research and development, information and communication technologies, improvement of political and regulatory environment, university cooperation, as well as general improvement of conditions for smooth development of business activities and market development is the way to create a strong innovation policy.



## **2. THE IMPORTANCE OF INNOVATION IN THE CONTEMPORARY MACRO AND MICRO ENVIRONMENT**

In a knowledge-based economy, innovation plays a very important and central role. However, the process of innovation has not been sufficiently understood over the years. Today, the role of innovation and its importance for the dynamics and progress of economies is almost completely understood all over the world. According to the Manual (2005), at the macro level there is considerable evidence that innovation is the dominant factor for national economic growth and for the international trade circle. The macroeconomic effects of any basic innovation are difficult to see in the first few years (sometimes even longer). It is important to point out that in the domain of economic growth, investment and employment, prevalence is more important, ie. the diffusion of basic innovation rather than just the discovery of basic innovation, and this is actually the period when imitators begin to realize the profitable potential of a new product or process and begin to invest large sums of money. The above shows that the importance of innovation is great for explaining the dynamics of economic growth. One of Schumpeter's greatest contributions, including his last, is his insistence that entrepreneurship is a unique factor of production and a rare social input that makes economic history evolve (Śledzik, 2013, pp. 90-91). Development policies that are oriented towards regional economic growth supported by the use of technology will accelerate and encourage increased productivity in community-based enterprises. Community economic development through entrepreneurial training will have an impact on economic growth, and efforts to increase community productivity require technological innovation (Stoica, Roman, Rusu, 2020). At the micro level, within firms, research & development (R&D) is seen as increasing an enterprise's ability to absorb and use new knowledge of all kinds, not just technological knowledge (Manual, 2005, p. 15). According to the same source, the literature indicates the term "innovation dynamo". The innovation dynamo is a complex system of factors that shape innovation at the firm level. Placing dynamos at the center of the map makes it possible to recognize the importance of a company for the economy to be innovative. That is why it is important to know what characteristics make companies more or less innovative and how innovations are generated in companies. The company's propensity to innovate depends on the technological opportunities it faces. Firms differ in their ability to recognize and exploit technological opportunities. The capacity of a company depends on: the structure of the workforce and infrastructure (skills, departments), financial structure, market strategy, competition, partnership with other companies or universities, and above all the internal organization of the company. Many of these aspects are complementary. The skills structure in particular goes hand in hand with the type of strategy, the financial structure and so on. The options provided to a firm that wants to innovate and change technological assets, capacity and production performance are: 1. strategy 2. research and development (R&D) 3. non-R&D activities (Manual, 2005, p.22). The development of innovations needed to support the increase of productivity of small and medium enterprises is carried out through a large number of different strategic actions, from improving workers' knowledge and skills, through improving product quality, through business management transformation and building sustainable business cooperation (Surya, Menne, Sabhan, Suriani, Abubakar, & Idris, 2021).

## **3. CONCEPT AND STRUCTURE OF THE GLOBAL INNOVATION INDEX (GII)**

In 2007, Professor Dutta first conceived and launched the concept and essence of the GII (Global Innovation Index) to find metrics and approaches that better capture the importance and richness of innovation in society, and that go beyond traditional measures of innovation such as research and articles and costs. which include research and development. The GII helps to create an environment where the innovation factor is constantly evaluated and which provides a basic technique and a rich database of detailed metrics for refining innovation

policies. The Innovation Index is not intended to be the only determinant of the position of economies based on their innovation. Measuring the results of innovation and their impact requires weight, and therefore great emphasis is placed on measuring climate and infrastructure for innovation to assess related outcomes (Dutta, Lanvin, & Wunsch-Vincent, 2020). The Global Innovation Index was launched in 2007 by Professor Dutta in collaboration with INSEAD Business School, Canon India and the Confederation of Indian Industry. Their goal was to assess the achieved level of innovation of certain countries based on two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index (Jovičić, Mirković, 2016, p. 66). The innovation input sub-index is the first GII sub-index. It contains five different pillars (Ravić, Đekić, 2018, p. 72): 1. Institutions; 2. Human capital and research; 3. Infrastructure; 4. Market sophistication; 5. Business sophistication. The Innovation Output Sub-Index is the second part of the GII and although it contains only two sub-pillars, it is as important as the Innovation Input Sub-Index. It consists of two sub-pillars (GII, 2019): 1. Scientific outputs, and 2. Creative outputs. Below is an overview of the 50 best ranked countries according to GII for the period 2018-2020.

*Table following on the next page*

Rank	Economy	Revenue (Strengths Weaknesses)	Group /	Strength Weakness	Results
1	Switzerland	Strengths		Strengths	68.4
2	Netherlands	Strengths		Strengths	63.3
3	Sweden	Strengths		Strengths	63.1
4	UK			Strengths	60.1
5	Singapore				59.8
6	USA				59.8
7	Finland				59.6
8	Denmark				58.4
9	Germany				58
10	Ireland				57.2
11	Israel				56.8
12	The Republic of Korea				56.6
13	Japan				55
14	Hong Kong, China				54.6
15	Luxembourg				54.5
16	France				54.4
17	China				53.1
18	Canada				53
19	Norway				52.6
20	Australia	Weaknesses			52
21	Austria	Weaknesses			51.3
22	New Zealand	Weaknesses			51.3
23	Island	Weaknesses			51.2
24	Estonia	Weaknesses			50.5
25	Belgium	Weaknesses			50.5
26	Malta				50.3
27	Czech Republik				48.7
28	Spain				48.7
29	Cyprus				47.8
30	Slovenia				46.9
31	Italy				46.3
32	Portugal				45.7
33	Hungary				44.9
34	Latvia				43.2
35	Malaysia	Strengths			43
36	Slovakia				42.9
37	Bulgaria	Strengths			42.6
38	UAE				42.6
39	Poland				41.7
40	Lithuania				41.2
41	Croatia	Strengths			40.7
42	Greece				38.9
43	Ukraine	Strengths			38.5
44	Thailand				38
45	Vietnam	Strengths			37.9
46	Russian Federation				37.9
47	Chile	Weaknesses			37.8
48	Moldova	Strengths			37.6
49	Romania				37.6
50	Turkey				37.4

Table 1: Top 50 countries ranked according to the global innovation index for the period 2018.

(Source: Global Innovation Index, 2020.)

Rank	Economy	Revenue (Strengths / Weaknesses)	Group Strengths Weaknesses	Results
1	Switzerland	Strengths	Strengths	67.2
2	Sweden	Strengths	Strengths	63.7
3	USA	Strengths	Strengths	61.7
4	Netherlands	Strengths	Strengths	61.4
5	UK	Strengths	Strengths	61.3
6	Finland			59.8
7	Denmark			58.4
8	Singapore			58.4
9	Germany			58.2
10	Israel			57.4
11	The Republic of Korea			56.6
12	Ireland			56.1
13	Hong Kong, China			55.5
14	China	Strengths		54.8
15	Japan			54.7
16	France			54.2
17	Canada			53.9
18	Luxembourg			53.5
19	Norway			51.9
20	Island			51.5
21	Austria	Weaknesses		50.9
22	Australia	Weaknesses		50.3
23	Belgium	Weaknesses		50.2
24	Estonia	Weaknesses		50
25	New Zeland	Weaknesses		49.6
26	Czech Republic			49.4
27	Malta			49
28	Cyprus			48.3
29	Spain			47.9
30	Italy			46.3
31	Slovenia			45.3
32	Portugal			44.6
33	Hungary			44.5
34	Latvia			43.2
35	Malaysia	Strengths		42.7
36	UAE			42.2
37	Slovakia			42
38	Lithuania			41.5
39	Poland			41.3
40	Bulgaria	Strengths		40.3
41	Greece			38.9
42	Vietnam	Strengths		38.8
43	Thailand			38.6
44	Croatia			37.8
45	Montenegro			37.7
46	Russian Federation			37.6
47	Ukraine	Strengths		37.4
48	Georgia	Strengths		37
49	Turkey			36.9
50	Romania			36.8

Table 2: Top 50 countries ranked according to the global innovation index for the period 2019.

(Source: Global Innovation Index WIPO, 2020.)

Rank	Economy	Revenue Group (Strengths / Weaknesses)	(Strengths / Weaknesses)	Results
1	Switzerland	Strengths	Strengths	66.1
2	Sweden	Strengths	Strengths	62.5
3	USA	Strengths	Strengths	60.6
4	Netherlands	Strengths	Strengths	59.8
5	UK		Strengths	58.8
6	Danmark		Strengths	57.5
7	Finland			57
8	Singapore			56.6
9	Germany			56.5
10	The Republic of Korea			56.1
11	Hong Kong, China			54.2
12	France			53.7
13	Israel			53.5
14	China	Strengths		53.3
15	Ireland			53
16	Japan			52.7
17	Canada			52.3
18	Luxembourg			50.8
19	Austria	Weaknesses		50.1
20	Norway	Weaknesses		49.3
21	Island	Weaknesses		49.2
22	Belgium	Weaknesses		49.1
23	Australia	Weaknesses		48.4
24	Czech Republic			48.3
25	Estonia			48.3
26	New Zeland			47
27	Malta			46.4
28	Italy			45.7
29	Cyprus			45.7
30	Spain			45.6
31	Portugal			43.5
32	Slovenia			42.9
33	Malaysia	Strengths		42.4
34	UAE			41.8
35	Hungary			41.5
36	Latvia			41.1
37	Bulgaria	Strengths		40
38	Poland			40
39	Slovakia			39.7
40	Lithuania			39.2
41	Croatia			37.3
42	Vietnam	Strengths		37.1
43	Greece			36.8
44	Thailand			36.7
45	Ukraine	Strengths		36.3
46	Romania			36
47	Russian Federation			35.6
48	India	Strengths		35.6
49	Montenegro			35.4
50	Philippines			35.2

*Table 3: Top 50 countries ranked according to the global innovation index for the period 2020.*

*(Source: Global Innovation Index WIPO, 2020.)*

Comparison of the period of the Global Innovation Index 2018-2020. year, the countries that are ranked in the top 10 best and most innovative hold their positions with slight changes on an annual basis. Mostly all countries are from the Europe, with the USA and Singapore outside Europe. It is interesting to note a few things. First, China, as the largest exporter, ranks approximately 15th every year, and it is interesting that a country with such an impact on the global economy is not in the top 10. Furthermore, it is obvious that innovation is not a priority for Russia, or something else. so it takes close to 50th place on the list every year. Interestingly, Montenegro is twice in the top 50 countries, which is a great result for a small country like it. In comparison, the Republic of Serbia has never been in the top 50 innovative countries. Switzerland, Sweden, the Netherlands, the United States, Singapore, Finland and others are the most innovative countries in the world and firmly hold their positions on GII, investing so much in innovation and technological advancement thus creating a new era of industrial revolution.

#### 4. ANALYSIS OF THE GII OF THE REPUBLIC OF SERBIA AND ITS SIGNIFICANCE FOR THE INNOVATION AND ENTREPRENEURIAL ENVIRONMENT

Table 4. below shows the position of the Republic of Serbia during the previous three years (2018-2020), taking into account the availability of data and changes in the GII model, which may slightly affect the annual comparisons in the ranking. The interval of statistical reliability of the position of the Republic of Serbia in GII 2020 is the position between 52 and 56.

Rank of the Republic of Serbia for the period 2018-2020.			
	GII	Innovation INPUTS	Innovation OUTPUTS
2020	53	58	56
2019	57	62	57
2018	55	56	58

*Table 4: Position of the Republic of Serbia in the GII in the period 2018-2020.  
 (Source: Global Innovation Index WIPO, 2020.)*

The Republic of Serbia is more efficient in innovation outputs than in innovation inputs in 2020; In 2020, the Republic of Serbia was better in the field of innovation inputs compared to 2019 and weaker compared to 2018; In the field of innovation outputs, the Republic of Serbia records the best result in 2020 compared to 2019 and 2018; The Republic of Serbia ranks 10th among 37 economies with higher middle income; The Republic of Serbia ranks 34th among 39 economies in Europe; According to the annual GDP, the Republic of Serbia records results above expectations for its level of development; Also, the Republic of Serbia produces more innovation outputs in relation to its level of investment in innovation. The Republic of Serbia has high results in four of the seven pillars of the GII: Institutions, Human Capital and Research, Infrastructure and Knowledge, and technological outputs, which are above average for higher middle-income groups. On the other hand, the Republic of Serbia records results below the average in its group in the field of Market Sophistication, Business Sophistication and Creative Exits. Although the Republic of Serbia ranks 53rd in the GII (2020), there are a few points where it records good results and advantages over other countries. What is good is that there is a lot of room for improvement in every sphere of GII. In order for the Republic Serbia to succeed in making a bigger step towards that, it is necessary to change the investment system. Venture capital is an extremely important factor in the development and advancement in every part of the GII, and it is certain that its influence would significantly advance the Republic of Serbia in all positions of the GII. Also, some index information is outdated in terms of spending on education, market capitalization, and government spending on higher education (Dutta et al., 2020, p. 319).

In order for the transformation of the innovation ecosystem in the Republic of Serbia to be successful, it is necessary for the entrepreneurial and innovation spirit to come to life much higher and rise to a much higher level than has been the case so far. This requires the progress and transformation of all pillars and their indicators of the Global Innovation Index as key fields of progress in the fields of innovation. The development of entrepreneurship, startup ecosystems and cluster communities in Republic of Serbia also depends on following the latest trends and implementing the most modern tools and knowledge that are provided today (Fimić, Gardašević, Kovačević, 2022, p. 415). Today, it is characteristic of the market to be driven by the globalization of processes. There is almost no point that has not been affected by globalization. The effect of this phenomenon has largely determined the function of the business system. Many studies show that different national cultures have different roles in the functioning of organizational systems. National cultures are also part of globalization (Gardašević, Ćirić, & Stanisavljević, 2021, p. 78).

## 5. CONCLUSION

So far, it has been possible to see in what way and what GII covers and how important is its measurement for national economies. With the help of measuring the global innovation index-GII, we find out in which areas the state should react, in order to improve the system and maintain progress and competitiveness in relation to other states. The National Innovation System is a set of organizations, institutions and their connections, ie a complex network of companies, universities, research and development institutions, educational and information infrastructure, government agencies and public resources aimed at generating, diffusing and applying scientific and technological knowledge in a given country (Kutlacha, Semnechenko, 2005). Creating a strong national innovation policy requires creating an environment that must foster innovation. To achieve this, it is necessary to redirect efforts to institution building by encouraging the environment to create innovation, advance the political and regulatory framework, strengthen cooperation between participants in innovation activities and the system, develop entrepreneurship, increase investment in research, development and technology and improve business activities.

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## SELF-SUFFICIENCY OF E-MAIL AS A MARKETING TOOL

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### ABSTRACT

*Modern digital communication channels, with their development, deform newly established patterns and very quickly influence changes in marketing practice. Starting from the question of whether marketing messages sent to consumers via e-mail are useful and can be used as a standalone tool, this paper presents a preliminary study of a sample of 192 respondents aimed at collecting guidelines for a larger study on the impact of modern digital communications channels on consumer behavior, ie on the necessary adaptations in marketing practices that are already based on digital technologies. The paper specifically focuses on electronic marketing messages and newsletters as a frequently used modern marketing tool. The research was conducted through a specially designed questionnaire which determined that e-mail as a standalone marketing tool is not effective and should be used in combination with some other tools. It has not been found that email positively influences the purchase decision nor is the newsletter as marketing tool competely positively accepted by the respondents.*

**Keywords:** *modern marketing communication channels, e-mail as marketing tools, newsletter*

### 1. INTRODUCTION

Information and communication technologies and their tools are increasingly being used, whether for private, business, or public purposes. Their importance is also noticeable in the fact that information and communication technology (ICT) topics are being included to a higher extent in various strategies and plans, together with an increase of financial resources planned for investment in these areas (EC Europe EU n.d., Georgescu and Teiu 2020). Constant progress and development enable the use of specially designed tools for various purposes, including marketing purposes. "One of the most challenging aspects for almost every organisation in the digital age is marketing of goods and services." (Shafack 2021 p.83). It is for this reason that ICT and its use for marketing purposes play a major role. Also, "With the development of modern technologies and the simplification of communication channels, completely new forms of sales have emerged" (Stofkova, Laitkep, and Stofkova 2022). "Digital marketing has become a company's most advanced and important strategy for promoting, advertising and communicating with many online customers." (Oyakhire 2021 [Rotich and Mukhongo 2015]). In addition, digital marketing is gaining importance, without showing signs of slowing down or stopping its impact on today's business (Muhammedrisaevna and Bakhridinovna and Rasulovna 2021). Since each (marketing) strategy has its strengths and weaknesses (Arnold 2011), this paper aims to examine the self-sufficiency and effectiveness of e-mail as a marketing tool. The question is whether e-mails, such as newsletters or standard e-mails, have a purpose: do they influence the decision to buy a product or choose a service, and if they do, is the impact positive or negative? It also raises the question of self-efficacy, i.e. self-sufficiency of e-mail as a marketing tool: Is e-mail sufficient in itself as a tool or should it be combined with other tools to achieve a purpose and thus contribute to the goal of increasing the purchase or using the services consequently leading to higher earnings and profits?

As newsletters are often sent by e-mail, the question whether they would be accepted by recipients, or (potential) consumers/customers, is also raised. This paper draws on Davis' Technology Acceptance Model (TAM), which is based on Ajzen and Fishbein's (Alfadda and Mahdi 2021) theory of reasoned action. TAM is a model based on two premises: the perception of usefulness and ease of use of technology by (potential) users. Although the model was designed in the 1980s, it is still used. This is visible in the increasing use of technology for marketing purposes, which paves the way for gaining online trust and loyalty from consumers and enables market growth (Thi Tuyet Mai and Yoshi and Phong Tuan 2013). According to Spremić (2017), ICT is an "interactive technology, and includes digital technology, i.e. all modern communication devices and concepts that can be used to digitally exchange content" (Špičić 2021 p.9). The use of ICT tools enables electronic business and moving jobs from physical to virtual space; it enables faster business, greater reach, more monitoring and measurement; it opens new markets without higher or additional costs; it encourages simpler relationships and interactions between stakeholders; it increases efficiency and effectiveness (Obeidat 2021). "Digital Marketing strategies are sets of controllable e-marketing variables that organizations combine to achieve marketing goals and to meet customers' needs." (Forghani and Sheikh and Hosseini et al. 2021). The goal of the marketing strategy is, of course, as high profitability and as large sales segment as possible, regardless of the industry in question. Therefore, digital marketing tools are an integral part of a successful marketing strategy and lead to digital business transformation: they enable maximum acceleration of almost everything that is done, connect different devices and people, individualize products and services, anticipate the needs of users/clients/consumers (Spremić 2017). "Email marketing is being increasingly recognised as a cost-effective marketing tool" (Rettie 2002). The use of e-mail is of great importance for the promotion of the company's products and services (Robertson 2020), as well as for encouraging customer loyalty through various benefits. E-mail marketing is a form of marketing that can introduce users to new products, discounts and other services through their e-mails, but can also help a company build a relationship with its existing or new audience (Oyakhire 2021). At the same time, it can direct potential customers to the company's website or web pages and the social media that the company uses in its presentation and advertising. The advantages of e-mail marketing are numerous: low costs, the possibility of a very fast preparation and organization of the desired content and its placement with the possibility of personalization, the possibility of quick response, consistency, interactivity, access from different places (spatial infinity) (Rettie 2002). On the other hand, e-mail marketing also has its drawbacks: disabled immediacy and persuasion (Rettie 2002), the possibility to ignore e-mails by their recipients, irritating recipients by sending (too many) e-mails, i.e. overload. In order for e-mail to be as efficient as possible, companies can use other tools and media, connect and interconnect them, which leads to the digital transformation of business (Spremić 2017). In order for communication and e-mail marketing to be effective, the attention needs to be placed on the competence (Muhammedrisaevna and Bakhriddinovna and Rasulovna 2021) – it needs to be known what, how and for whom is being done and why. Sending a newsletter, a prepared material containing information useful to consumers, at least once a month aims to maintain consumers and ensure consumer confidence (Oyakhire 2021). According to Dobrinić (2020) and relying on the improved model of ad value set by Ducoffe (1996), the value of advertising depends on four factors: entertainment/fun of the content, informativeness, irritability, and credibility. Entertainment refers to the satisfaction and positive emotions of the recipient of the message; informativeness implies the ability to provide effective information, that which the end user, or the audience, really wants or needs; irritability is the arousal of unpleasant and unwanted feelings; and, credibility refers to the perception of accuracy and giving accurate information that can be trusted (Mahatmavidya and Yasa 2020).

While the need for informativeness, entertainment and credibility is required in as large quantity and to as large extent as possible, irritability needs to be kept to a minimum in order for the ad value and the value of advertising to be as high and successful as possible.

## 2. MATERIALS AND METHODS

This paper presents quantitative research conducted through an online survey using a questionnaire. The questionnaire was designed exclusively for the purpose of conducting research on the self-sufficiency of e-mail as a marketing tool. The ten questions included in the questionnaire have been divided into two parts: while the first part consists of socio-demographic questions, the second part contains thematic questions about e-mail. The first part of the questionnaire includes questions about age, gender, education level and the county from which the respondent comes. The second part contains closed-ended questions with offered answers where respondents choose how they prefer to do their shopping, how often they buy online, how they keep themselves informed about discounts and promotions, and the extent to which they agree with the statements about the impact that newsletters have on their purchase and the effectiveness of e-mail for marketing purposes. When expressing preference, respondents can choose one of the pre-written answers or express agreement on a scale of 1 to 5, where 1 indicates the lowest level of agreement with a particular statement, and 5 the highest level of agreement. The online questionnaire was active from 15 to 27 July 2021 and was completed by 192 respondents. There are differences in gender and age among the respondents, with all respondents being of legal age and over 18 and have voluntarily agreed to share personal information anonymously. The data was collected electronically using Google forms and analyzed using the SPSS statistical processing tool. The aim was to answer previously asked questions: "Do marketing messages received by e-mail affect the purchase decision?", "If so, do they affect it in a positive or negative way?", "Is e-mail as a marketing tool self-effective/self-sufficient?", and "Are newsletters well received, are they used?".

These questions were used to form the following hypotheses as a starting point for the research:

- H1: E-mail as a marketing tool positively influences the purchase decision.
- H1.1: Newsletter is a positively accepted marketing tool.
- H2: Newsletter subscription correlates positively with the impact newsletter has on the purchase.
- H3: E-mail mail is not self-effective as a marketing tool.
- H4: Age and impact the newsletter has on purchase are positively correlated.

## 3. RESULTS

The prepared online questionnaire and the answers collected by it make the basis of this research. The results obtained by the answers of the respondents allow the pre-set hypotheses to be confirmed or rejected. The convenient sample includes a total of 192 respondents, of which 176 were female (91.7%) and 16 male respondents (8.3%). The age of the respondents ranges from 18 to over 50 years of age, with the largest number of respondents from the age group of 24 to 30 years of age (35.9%). It is followed by the age group from 19 to 23 (27.1%) and the age group from 36 to 40 years of age (16.1%). Other age groups make up less than 10% of the total number of respondents. With regard to education, the largest number of respondents have a high school diploma, which is in line with the largest number of respondents from the age group of 19 to 23 because in that period the majority either still studies or has completed secondary education as the last level of compulsory education in Croatia. In addition, the smallest number of respondents, 2.1% and 1.6%, respectively, have the title of Doctor of Science and Master of Science according to the old, pre-Bologna system.

All respondents are from Croatia, predominantly from Koprivnica-Križevci County (37%), followed by the City of Zagreb (14.6%) and Zagreb County (8.9%). When asked “Do you buy more online or in physical stores?”, 136 respondents (70.8%) stated that they preferred to buy in physical stores, while 56 (29.2%) bought more online. To the question “How do you find out about discounts and promotions?” 128 respondents (66.7%) answered that they found out about discounts through social networks, while 32 of them found out through the company’s web pages. Only 27 respondents (14.1%) found out about discounts and promotions via newsletter. One respondent stated that they found out about discounts and promotions through advertisements, recommendations, word of mouth, in the store, and through all the above. Answers to the question about the impact the newsletter has on the purchase decision (“Does the newsletter affect your purchase decision?”) mainly show that the majority (82 respondents, 42.7%) believe that the newsletter does not affect their decision on purchase (at all). Also, to a greater extent (34.4%) the respondents chose 3 as the answer, which suggests that respondents are not sure whether or not the newsletter affects their purchase decision. Just over 20% of respondents (44 respondents in total) believe that the newsletter influences their purchase decision. In order to obtain specific results that will contribute to the research in this paper, a correlation was made in the SPSS program between the answers to the two questions asked. The first question whose answers are correlated is “Do you subscribe to newsletters?” while the other is “Do newsletters affect your purchase decision?”. The collected responses were correlated and result in the negative correlation, which can be seen in Figure 1.

### Correlations

		IMPACT_NEWSLETTER	SUBSCRIPTION_TO_NEWSPLETTER
IMPACT_NEWSLETTER	Pearson Correlation	1	-.369**
	Sig. (2-tailed)		.000
	N	192	192
SUBSCRIPTION_TO_NEWSPLETTER	Pearson Correlation	-.369**	1
	Sig. (2-tailed)	.000	
	N	192	192

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Figure 1: Correlation between the newsletter’s impact on purchase and newsletter subscription*

According to the respondents’ answers to the question “Do you think that e-mail is an effective channel for marketing activities in combination with another marketing tool?” it can be concluded that most respondents believe that e-mail is (fully) effective in combination with other marketing tools - 53.1% or 102 respondents answered the question with the choice of 4 or 5, which (fully) confirms agreement with the statement that e-mail is effective in combination with another marketing tool. Correlating the respondents’ age and their opinion on the impact of the newsletter on the purchase shows that the correlation does not exist and has not been determined by statistical analysis. This is evident in Figure 2.

## Correlations

		IMPACT_NEWSLETTER	AGE
IMPACT_NEWSLETTER	Pearson Correlation	1	.101
	Sig. (2-tailed)		.163
	N	192	192
AGE	Pearson Correlation	.101	1
	Sig. (2-tailed)	.163	
	N	192	192

Figure 2: Correlation between the newsletter's impact on purchase and respondents' age

## 4. DISCUSSION

The results of the research collected by the means of the questionnaire have aided in determining whether the hypotheses can be accepted or rejected, which leads to answering the research questions. Therefore, the answers to the question "Does the newsletter affect your purchase decision?" have demonstrated that the majority do not perceive the newsletter as a marketing tool that has an impact during purchase or that it affects the purchase. Consequently, the hypothesis that e-mail as a marketing tool positively influences the purchase decision was rejected, as well as the hypothesis that the newsletter is a positively accepted marketing tool. Additionally, neither H1 nor H1.1 have been confirmed. In order to confirm or reject Hypothesis 2 stating "Newsletter subscription correlates positively with the impact newsletter has on the purchase," a correlation was made in the SPSS program between the answers to the two questions asked. The answers to the two questions were correlated: "Do you subscribe to newsletters?" and "Do newsletters affect your purchase decision?". Statistical analysis has indicated that there is a statistically significant negative correlation between those who subscribe to the newsletter and those who believe that the newsletter influences their purchase (see Fig.1). Those who are interested in the newsletter and have subscribed to it believe that their decision to buy is not based on the information obtained through the newsletter. In this way, the newsletter is perceived as something that has a negative impact on the purchase and it is not positively accepted by the subscribers. It can be concluded that in this case the newsletter is something that dulls the space of the newsletter recipient and instead of fulfilling its purpose to encourage the recipient to action, or purchase, it actually leads to an unwanted reaction, a situation where the recipient gives up or does not think of the purchase. In this way, the newsletter, instead of contributing to the increase in sales or use of certain services, it works counterproductively. It is possible to conclude according to the ad value model that the level of irritability of the newsletter is high and contributes to its negative perception, i.e. non-use for the purposes for which it was originally intended. Therefore, H2 stating "Newsletter subscription correlates positively with the impact newsletter has on the purchase." has been rejected. The hypothesis H3 states that "E-mail mail is not self-effective as a marketing tool." According to the respondents' answers to the question "Do you think that e-mail is an effective channel for marketing activities in combination with another marketing tool?", it can be concluded that the majority of respondents believe that e-mail is (fully) effective in combination with other marketing tools - 53.1%, i.e. 102 respondents answered the question with the choice of 4 or 5, which (fully) confirms agreement with the statement that e-mail is effective in combination with another marketing tool. This confirms hypothesis H3.

The lack of correlation between the question about the age of the respondents and their opinion on the newsletter's impact on the purchase has led to rejecting H4: "Age and impact the newsletter has on purchase are positively correlated." The results of the survey confirm the applicability of Davis' Technology Acceptance Model. What users find useful – they use, just as they use what is easy and yet effective for them.

## 5. CONCLUSIONS

Finding an adequate channel of marketing communication is the focus of interest of marketing science and practice. In doing so, the magnitude of the hidden negative impact is often forgotten in order to increase productivity. The results of the presented research indicate the possibility that this (hidden) negative impact occurs when using e-mail and newsletters. Negative acceptance of messages by the target group, regardless of them being loyal or just potential consumers, is very likely to lead to irritation and provoke resistance rather than lead to the purchase decision. therefore, it will have more impact on reducing sales rather than on increasing them. The diversity of the target group and the amount of exposure to marketing messages in this case did not prove to be sufficient factors according to which e-mail and newsletter could be considered effective marketing channels. The results indicate the need for research on the perception of messages received through various modern marketing channels by (potential) consumers and continuous monitoring of their satisfaction and preferences regarding the way of receiving a marketing message. On the other hand, there is a task to find new solutions and adapt old marketing channels.

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## **“RETHINK” DEVELOPMENT ON THE ISLANDS - STAKEHOLDERS' VIEWS ON THE SUSTAINABILITY**

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### **ABSTRACT**

*The sustainable use of island resources requires striking a balance between activities to improve the quality of life of the island population and the preservation of the environment as a natural resource on which present and future generations depend. The island economy is based on natural conditions and has its own development limitations compared to the mainland economy, such as electricity and water supply, adequate waste disposal, isolation of transportation, climate adaptation, drought, population decline etc. Due to the above challenges, the author conducted a research with the stakeholders of the Northern and the Southern Adriatic Islands to get a rough idea of whether the main stakeholders are aware of the importance of implementing some sustainable development activities, focusing on energy transition and municipal infrastructure including water supply and waste management. The research focuses on stakeholders' perceptions of the concept of "rethinking" or taking a new look at island development to better implement sustainability principles. From the research results, which are descriptively presented in the PESTLE analysis, it is concluded that all stakeholders are familiar with the concept of sustainable development, but are also aware of the need to make more efforts to implement sustainable development in the daily lives of islanders. The National Development Plan for the islands in the Republic of Croatia for the period 2021 to 2027 also has the basic goal of bringing the living conditions and quality of life on the islands closer to those on the mainland.*

**Keywords:** *islands, energy transition, sustainable development, The National Development Plan for the islands 2021.-2027.*

### **1. INTRODUCTION**

To preserve the uniqueness of the island territory, it is extremely important to ensure the sustainable use and management of its resources. Island resources include all tangible and intangible resources that serve the sustainable use of the island's environment and the preservation of the island's way of life and identity (National Island Development Plan, 2021). Sustainable use of island resources implies striking a balance between activities aimed at improving the quality of life of the island's population and preserving the environment as a natural asset on which present and future generations depend (Starč, 2001). Self-preservation of all Croatian islands is the main goal to be pursued in the future (Law on Islands, NN No. 116/18, 73/20, 70/21). It is especially important to preserve the pristine natural areas of the islands as much as possible, i.e. to encourage investments in fallow land wherever possible (Zaletova et al., 2021). Brownfields on the island are the key to sustainable development without significant degradation of the pristine natural environment. Preservation of the natural features of the island landscape can be ensured through the conversion of existing buildings, most of which are dilapidated and neglected. Special attention should be given to promoting investments in green infrastructure, defined by the European Commission as a network of natural, semi-natural areas and green spaces that provide ecosystem services, thereby enhancing people's well-being and quality of life (EC, 2013, EC 2019, Marando et al., 2022, Zulian & Maes, 2021). The application of green infrastructures on islands will bring several benefits: environmental (preservation of biodiversity, adaptation to climate change, improvement of air,



water and soil quality), social (human health, improvement of quality of life through outdoor recreation, education) and economic (savings in energy costs, job creation, increase in real estate prices), consistent with the concept of sustainable development (EEA, 2020). In addition to green spaces, green infrastructure also includes the so-called blue infrastructure, which includes urban drainage, accumulation of freshwater resources, etc., and as such it is promoted as one of the priority options in the construction or reconstruction of water management facilities, for example, in the form of green cassettes or pits for drainage, rainwater and stormwater collection systems, which are subsequently reused and can be used precisely to maintain elements of green infrastructure on the islands, especially during the summer months when there are dry periods with water shortages. Water is a crucial resource on the islands, both for the daily needs of the local population and for the continuous development of economic activities, especially in the summer months, so its constant availability must be ensured (Zafeirakou, 2022). On the islands of Krk and Cres in the Kvarner Gulf, energy transition initiatives towards the use of renewable energy sources, alternative fuels and clean energy are being promoted (Mimica et al., 2022a,b). Due to their natural and climatic conditions, the islands are vulnerable to natural threats such as forest fires and droughts, as the highly flammable Mediterranean vegetation and very dry and hot periods in summer favor the occurrence and rapid spread of forest fires, especially in the southern parts of the Republic of Croatia (Rosavec, 2022). The lack of water and transport isolation make it difficult to cope with such phenomena, so measures are recommended to prevent and mitigate the extent of possible future damage that natural threats may cause to the environment and the island's economy. Due to all these challenges, the author has conducted a research on the islands of the northern Adriatic (Krk and Cres) and the islands of the southern Adriatic (Ugljan and Brač) in order to get a rough idea of whether the main actors are aware of the importance of implementing some sustainable development activities, focusing on energy transition and municipal infrastructure, including water supply and waste management. The paper is structured to include two chapters in addition to the introduction. After the introduction, the aspects and characteristics of energy transition and renewable energy sources as well as the concept of smart island were examined using islands in the United Kingdom as an example, then the challenge of municipal infrastructure was analyzed with a focus on water supply and waste management. In the second part, research was conducted among key stakeholders and a PESTLE analysis was carried out. In conclusion, stakeholders are well acquainted with the concept of sustainable management, but are aware that more efforts need to be made to implement sustainable development in the daily lives of islanders.

## **2. ACTIVITIES FOR THE IMPLEMENTATION OF SUSTAINABLE DEVELOPMENT ON THE ISLANDS**

In order to create the conditions for a better quality of life in the islands, it is important to promote activities related to the application of smart and energy-efficient solutions in the economy, construction, transport and the provision of municipal services to ensure the islands' self-sufficiency. In addition, one of the most important activities focuses on the rehabilitation of existing and construction of new municipal infrastructure, which is currently unsatisfactory in most islands. The following is an analysis of the aforementioned activities.

### **2.1. Energy transition on the island and renewable energy sources**

In order to increase the island's energy autonomy and reduce its environmental impact, energy transition initiatives on the island towards the use of clean energy sources should be promoted (Katsaprakakis et al., 2022). Developing and promoting the development of a renewable energy system, the use of clean energy, and energy efficiency will improve the island power grid and stimulate the generation of primary energy from renewable sources.

This will allow greater security of electricity supply, greater energy efficiency in business, buildings, transport and households to save energy, and the use of alternative fuels in island transport to reduce the environmental impact of exhaust fumes from motor vehicles and ships. In addition to the introduction of complex technical solutions in favour of energy efficiency on the islands, it is necessary to carry out activities aimed at raising awareness among the island population about the possibilities of using more energy efficient solutions and the benefits of using renewable energy sources (Krstinić Nižić, Blažević, B., 2017). At the same time, the participation of the population through energy cooperatives is very important to learn about and report on projects focused on renewable energy sources (Simić, 2022). Electricity supply on the islands is mainly by "import" from the mainland through a distribution and transmission network that includes submarine cables, overhead lines, cables, and substations. All consumers on the islands have the right to distribution of electricity and access to the grid on the same terms as mainland consumers. Of particular importance is the replacement of submarine cables that have reached the end of their service life, which causes occasional power outages on some islands and can lead to longer-term interruptions in power supply. In addition, wherever possible, the introduction of smart solutions in power systems should be encouraged. Renewable energy sources currently do not have a significant share in the energy sector on the Croatian islands, although they have great potential. Due to their natural conditions and geographical location, Croatian islands have resources that can be used for clean energy production (wind energy, solar energy, wave energy, biomass energy). The energy demand of the islands is increasing, mainly due to the growing tourism sector. Considering the increased demand in the summer months, which can cause difficulties in the supply of electricity, it is necessary to promote the use of renewable energy sources, allowing for additional security of energy supply. Numerous "smart island" projects are currently underway to promote better practical solutions (<http://insulae-h2020.eu/>).

#### *2.1.1. Characteristics of the intelligent / smart islands*

Smart Islands is a major programme of interconnected projects that aims to support the community in moving towards a low-carbon future with sustainable energy, water, sewage and waste management. This is what the smart island aims to achieve on the Isle of Scilly, United Kingdom (<https://smartislands.org/>):

- Reduce electricity bills by 40% by 2025 – this will be achieved by reducing how much energy it uses and utilising renewable energy produced, distributed through an innovative community venture and local energy tariff
- Generate 40% of the Islands' electricity by renewables by 2025 – through a combination of solar, energy from waste and potentially wave, wind or tidal
- Transition to 40% of vehicles being low carbon or electric by 2025 – installing infrastructure to support electric vehicles
- Manage waste and sewage locally and sustainably – by treating food and other organic wastes in an energy from waste plant
- Raise aspirations and provide opportunities – provide training and job opportunities, create links with Universities
- Become an environmentally aware and responsible tourism destination – building new momentum and adding credibility to own identity and positioning

*Figure following on the next page*



*Figure 1: The concept of smart island*  
(Source: <https://scilly.gov.uk/business-licensing/smart-islands>)

Both public and private investment will support the programme in achieving its aims, for the benefit of the community. Businesses are already being supported to improve their energy efficiency, but can now also be supported financially to make their buildings more energy efficient and instal renewable energy infrastructure. Electric vehicle charging points will help those who want to invest in an electric vehicle in the future. Electric cars and vans will be cheap to run and could be powered entirely by renewable energy, making them almost zero carbon. Low mileage trips and low speeds make the islands an ideal location for the use of electric vehicles. The benefits of all the energy and profits from the projects will be captured for the community through a not-for-profit community venture. This will result in islanders benefiting from a competitively priced, low carbon electricity tariff.

## **2.2. Municipal infrastructure and waste management**

Regarding water supply and drainage, most of the inhabited island area is characterized by limited availability of water for human consumption, so it is a key resource that must be secured in order to improve the quality of life of the island population, but also to create conditions for the activity of island entrepreneurs and reduce the development gap between island and coastal areas. It is necessary to promote the development of the water supply system through the installation, reconstruction and rehabilitation of submarine water supply pipelines and the construction of new and reconstruction of existing municipal water structures (water intake points, water storage tanks, main pipelines, associated buildings of the water supply network). Investments should also focus on the construction of the water supply network on the islands themselves and the provision of connections to households and businesses. On islands where investment in water supply through underwater pipelines is unprofitable, alternative ways of supplying water for human use must be pursued, such as desalination plants, especially those powered by renewable energy sources.

There is a need to promote systems for the purification and reuse of recycled wastewater and the construction of infrastructure for the transport of recycled water from its point of origin to the places where it is needed. Recycled water can be used in industry, agriculture, public land maintenance, and households, and it is necessary to test technological solutions that bring this water to a healthy level for human consumption. Recycled water is becoming an economical and environmentally friendly solution, and as such is particularly useful in areas where demand for water exceeds supply. Investments in the public drainage system primarily involve the construction, reconstruction, or rehabilitation of public drainage system buildings, including wastewater treatment facilities (Action Plan, 2021). In addition to the expansion of the public drainage system, the use of individual systems such as compost systems should be encouraged, especially on islands where the public drainage system has not yet been expanded. The use of composting systems in drainage is a more environmentally friendly solution and a potential replacement for semi-permeable septic tanks used on islands where there is no developed drainage network. By using a composting system, waste is treated at the point of generation, eliminating the need to construct a public sewer system and water treatment plant. The water supply and wastewater system on the islands should be developed using smart solutions to reduce the cost of water distribution, ensure the long-term sustainability of municipal infrastructure, and increase energy efficiency. Waste management includes the activities of collection, transportation, recovery, including sorting, and disposal of waste, including the monitoring of the implementation of these activities, the monitoring and actions at the places where the waste was disposed, as well as the actions carried out by waste dealers and brokers in the context of waste management, and represents one of the most important development needs in the islands (Luttenberger, 2020, Zovko et al., 2021). Reduction of waste generation and promotion of waste separation at the doorstep, as well as proper management of all types of waste, including marine waste, create conditions for their reuse according to the principles of circular economy (Šverko Grdić et al., 2020, Dekanić et al., 2021 ). The island's waste management system needs to be improved in order to reduce the amount of waste and the pollution of space by waste, and to increase the level of waste separation. First and foremost, activities to raise awareness and inform residents and visitors about the importance of proper waste separation at collection points must be promoted so that waste can be recycled and reused.

### **3. RESEARCH DESIGN**

The research was conducted in August and September 2022 on the islands of the northern Adriatic (Krk and Cres) and the islands of the southern Adriatic (Ugljan and Brač) in order to get a rough idea of whether the main stakeholders of the islands (directors of tourist boards, employees of local self-government units, directors of larger companies of cities and municipalities on the islands) are aware of the importance of implementing some sustainable development activities, focusing on energy transition and municipal infrastructure, including water supply and waste management. A structured interview was conducted with the stakeholders, and this paper presents selected relevant positions and presents the results in a descriptive and a PESTLE analysis. The research included a total of 14 relevant stakeholders. The research focused on perceptions of the concept of "rethinking" or looking at island development in a new way to better implement the principles of sustainability. The results of the survey suggest that all stakeholders are familiar with the concept of sustainable development, but they indicate that the destination's sustainable development rules are not being followed during the summer months. Such information can be worrying, as mass tourism expressed only in season can be an obstacle to future development. Therefore, it is recommended to create new tourist products that are attractive outside the summer season. When asked if you believe that the introduction of the concept of a smart island and energy transition on the island would have a positive impact on the development of the island, most

believe that the introduction of such projects would improve the lives of the local population and keep the existing young population on the island. Although not all respondents are familiar with the concept itself in detail, they believe that smart island development leaves plenty of room for any community that decides to take this step to determine the appearance and functionality of its environment itself, while respecting the historical, cultural, artistic, and social heritage of each neighbourhood. The respondents want modern development, but at the same time they want to preserve the independence of their environment. Introducing the concept of smart destinations requires diversity, creativity, and the development of cultural facilities along with stronger information and communication infrastructure and sustainable transportation (Kovačić, 2022). When asked who they think is most responsible for the new thinking and implementation of sustainable development, all agree that all stakeholders in the destination should work together to achieve the goals set. The above findings point to the need for a constant connection between all stakeholders in the community in order to improve the quality of life of islanders. According to research, it is evident that the island of Krk is a pioneer in implementing the concept of "rethinking", as it implements many measures related to energy transition and waste management (Young et al., 2020). Based on the analysis of secondary data and previous research, and taking into account the input obtained through in-depth interviews and focus groups with key stakeholders in island development, uncontrolled variables from the environment were included in the analysis with the aim of identifying and highlighting critical factors that significantly influence the current and future Croatian islands. The analysis of PESTLE is presented in the table below, which identifies important factors for the sustainable development of islands in the Republic of Croatia.

Political factors		Economic factors	
With a favorable influence (+)	With an unfavorable influence (-)	With a favorable influence (+)	With an unfavorable influence (-)
<ul style="list-style-type: none"> <li>international initiatives in the field of island development</li> <li>EU Funds 2021. – 2027.</li> </ul>	<ul style="list-style-type: none"> <li>excessive inequality between land and islands</li> <li>insufficient communication between the different levels of administration</li> </ul>	<ul style="list-style-type: none"> <li>development of island product</li> <li>circular economy on the islands</li> <li>investment in sustainable forms of tourism</li> </ul>	<ul style="list-style-type: none"> <li>vulnerability of the islands' economy</li> <li>dominance of tourism on the islands, neglect of agriculture</li> </ul>
Sociological factors		Technological factors	
With a favorable influence (+)	With an unfavorable influence (-)	With a favorable influence (+)	With an unfavorable influence (-)
<ul style="list-style-type: none"> <li>preservation of the island's cultural and historical heritage and natural resources</li> <li>belonging to the island community and the development of the island identity</li> </ul>	<ul style="list-style-type: none"> <li>negative demographic indicators (population exodus from the island)</li> <li>the seasonality of tourism affects the life of the islanders</li> </ul>	<ul style="list-style-type: none"> <li>the use of renewable energy sources</li> <li>waste management system</li> </ul>	<ul style="list-style-type: none"> <li>high costs of introduction and renewal of electricity and water supply networks</li> <li>speed of maritime traffic</li> </ul>
Environmental factors		Legal factors	
With a favorable influence (+)	With an unfavorable influence (-)	With a favorable influence (+)	With an unfavorable influence (-)
<ul style="list-style-type: none"> <li>energy transition on the island</li> <li>adaptation to climate change, protection and management of the environment</li> </ul>	<ul style="list-style-type: none"> <li>landfills on the islands</li> <li>high infrastructure costs for the treatment of rainwater and wastewater</li> </ul>	<ul style="list-style-type: none"> <li>legal regulations of the EU and the Republic of Croatia</li> </ul>	<ul style="list-style-type: none"> <li>intertwining of responsibilities of different institutions</li> </ul>

*Table 1: PESTLE analysis of the environment on the island of the Republic of Croatia  
 (Source: Author's elaboration according to the National Island Development Plan 2021 - 2027)*

#### 4. CONCLUSION

The islands face many challenges in their development, especially during the summer months when the number of tourists exceeds the number of residents. Constraints such as water and energy shortages, waste accumulation, problems with transportation infrastructure, climate change, etc. are emerging. Climate change is one of the greatest threats to biodiversity, so the use of renewable energy sources and energy efficiency measures become the key to managing and mitigating climate change (Kelman, 2014, Perić & Šverko Grdić, 2017). In the conservation of marine and terrestrial habitats, the main threat to island biodiversity is pressure from human activities, especially exploitation of mineral resources, illegal waste dumping, marine litter, expansion of construction areas, and illegal and unsustainable construction, so it is necessary to provide mechanisms for the protection of the island landscape in the spatial planning documents of island municipalities and cities, with effective monitoring and functional removal of buildings and remediation of contaminated areas on the islands. Environmental protection in the island territory should be promoted through the use of alternative fuels and smart technologies, appropriate waste management, promotion of energy and environmentally sustainable production processes, transition to more energy-efficient and environmentally friendly means of transportation, and the use of information and telecommunications technologies to reduce physical traffic wherever possible (working from home, online shopping, business with public administration, telemedicine, etc.). As part of an increased implementation of sustainable development, it is necessary to invest in the creation of documents based on scientific knowledge, such as risk assessments and spatial planning documents, raising awareness among island residents, the construction of fire roads, the protection and maintenance of water sources, the conservation and management of forests, the strengthening of infrastructure and ensuring monitoring measures. Measures to mitigate climate change and adapt to its consequences must be included in the spatial planning documents of island municipalities and towns, also because land use change (from forest to agricultural land or construction land) is considered one of the main causes of the increase in greenhouse gas emissions. In the area of island agriculture, traditional agricultural practices that strengthen the resilience of ecosystems, habitats, and species to climate change need to be valued and promoted, and in the area of fisheries, adaptation to potentially new conditions for fisheries and aquaculture is needed because of projected increases in ocean temperatures that may lead to increases in alien species and impacts on native species. The concept of a "smart island" is based on continuous improvement through technological solutions in the process of sustainable development, which in its essence presupposes an intelligent, interconnected system. As islands develop through their utility infrastructure, the importance of information and communication technology and integrated solutions will continue to grow and become irreplaceable. Smart islands will be measured by the degree of integration of ICT infrastructure at all levels, interconnected by the energy, health, transport, ecology and administration sectors. The research results of this work can help important people at regional and local levels in decision making. The results obtained can serve as a basis for policy decisions to create a more proactive, smarter, and sustainable island. Local development policymakers urgently need to take the necessary steps to find solutions to provide more quality services to more people, which means a greater influx of people to the islands. This requires some kind of rethinking of development that offers the island's appeal year-round, not just in the summer months. There are a number of shortcomings in this work. The limitation of the research lies in the analysis of a relatively small number of stakeholders. In addition to a larger sample of respondents, it is necessary to conduct the research on as large a sample of the island as possible. Recommendations for future research can be a comparison of Croatian islands with the islands of other countries, as well as research on the topic of financing smart solutions, which was also not addressed in this paper.

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## THE SIGNIFICANCE OF BANKRUPTCY IN MODERN BUSINESS AND ABUSE IN THE FIELD OF BANKRUPTCY

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### ABSTRACT

*Bankruptcy is an very important institution in modern business. Article 82 of the Constitution of the Republic of Serbia stipulates that the economic system in the Republic of Serbia rests on a market economy, open and free market, freedom of entrepreneurship, independence of economic entities and equality of private and other forms of property. Bankruptcy occurs when the debtor's property is reduced to such an extent that his debts to creditors exceed the property value that was the cover to pay such debts. This is actually a situation in which the debtor is no longer able to guarantee the creditors the performance of the assumed obligations, against the value of the property at his disposal. According to the Law on Bankruptcy of the Republic of Serbia, bankruptcy is implemented through bankruptcy or reorganization. In this part, the paper will deal with the concept and importance of bankruptcy as an institution that contributes to safer business operations of economic entities, and is equally important for both creditors and debtors. However, bankruptcy, as an important institution of commercial law, is exposed to various possibilities of abuse. If the acts of abuse are more serious and significantly disrupt stable business operations, abuses in the field of bankruptcy qualify as criminal acts, which are regulated by the Criminal Code of the Republic of Serbia. Criminal offenses that have bankruptcy as a protective object belong to the group of criminal offenses against the economy and are therefore part of an important area of criminal law, which is called economic crime. In this part, the paper will deal with the segment of economic crime in the part related to abuses in bankruptcy, and the subject of analysis will be current judicial practice in the part of filed criminal charges and judgments for criminal offenses relevant to bankruptcy. The paper is methodologically based on a theoretical analysis of relevant contemporary positions in theory, a normative analysis of legislative sources, and a quantitative analysis of statistical indicators in the domain of the research subject. The research is based on official statistical data of the Republic Institute of Statistics.*

**Keywords:** *Abuses in the field of bankruptcy, Bankruptcy, Business operations, Business entities, Economic crime*

### 1. INTRODUCTION

Bankruptcy as a commercial law institution occurs when the debtor's property is reduced to such an extent that his debts to creditors exceed the property value, which was the cover to settle such debts. This is actually a situation in which the debtor is no longer able to guarantee the creditors the performance of the assumed obligations, against the value of the property at his disposal. Bankruptcy is an extremely important institution in modern business. Article 82 of the Constitution of the Republic of Serbia (2006) stipulates that "economic organization in the Republic of Serbia rests on the market economy, open and free market, freedom of entrepreneurship, independence of economic entities and equality of private and other forms of property". Business entities enter into many legal relationships within which certain rights and duties arise for them.

According to the fact that these duties are very often of a financial nature, it is clear that business entities enter into debt-creditor relationships primarily due to the need to provide funds that they need at a certain moment, but which they do not have at their disposal in specific circumstances. As long as the debtor is solvent in the specific debtor-creditor relationship, there is no problem in business. However, complications in business arise when the debtor finds himself in a situation where he cannot settle his debt to his creditors, i.e. when he becomes insolvent. In such a situation, one of the possibilities is definitely bankruptcy. An efficient bankruptcy system, according to Cvetković (2004), is a necessary part of the market economy because it ensures security for creditors, the recovery of companies with financial difficulties and the faster return of blocked funds to use. In this part, the paper will deal with the concept and importance of bankruptcy as an institution that contributes to safer business operations of economic entities, and is equally important for both creditors and debtors. However, bankruptcy, as an important institution of commercial law, is exposed to various possibilities of abuse. If the tortious actions are more serious and significantly disrupt stable economic operations, abuses in the field of bankruptcy qualify as criminal acts, which are regulated by the Criminal Code of the Republic of Serbia. Criminal offenses that have bankruptcy as a protective object belong to the group of criminal offenses against the economy and are therefore part of an important area of criminal law, which is called economic crime. In this part, the paper will deal with the segment of economic crime in the part related to abuses in bankruptcy, and the subject of analysis will be current judicial practice in the part of filed criminal charges and judgments for criminal offenses relevant to bankruptcy. The work is methodologically based on the theoretical analysis of relevant contemporary positions in theory, a normative analysis of legislative sources, and the quantitative analysis of statistical indicators in the domain of the research subject. The research is based on official statistical data of the Republic Institute of Statistics.

## 2. LITERATURE REVIEW

Companies very often, especially in conditions of economic crisis, find themselves in financial difficulties and become insolvent towards their creditors. Insolvency in its primary meaning "refers to the debtor's inability to pay his debts as they fall due" (Honsberger, 1972, p. 200). This situation most often arises "if the debtor's liabilities exceed his assets, and lead to a decrease in the funds available to the debtor, and limit his ability to settle his obligations to permanent creditors" (Babatunde Onakoya and Eunice Olotu, 2017, p. 707). According to the opinion of numerous foreign authors, the essence of the existence of bankruptcy lies in the settlement of creditors with an attempt to get the company out of the crisis and restructuring, as key elements for understanding the dynamics of industry and evolution (Decker and Mellewig, 2007; Ghemawat and Cassiman, 2007; Ketchen, et al., 2004), because specifically, "credit constraints of a business entity significantly affect the size and growth of the company" (Beck, et al., 2005; Fagiolo and Luzzi, 2006). Determining the essence of the conceptual definition of bankruptcy, the legal and economic aspects can be distinguished. From a legal point of view, "bankruptcy is a procedure in which all creditors of the bankrupt debtor are settled" (Radović, 2017, p. 30), i.e. it is "judicial seizure of the debtor's entire property in favor of joint creditors" (Dragojlović, et. al., 2019, p. 18). From an economic point of view, "bankruptcy is a state in which a debtor who has suspended payments or whose assets are insufficient to settle the claims of all creditors whose claims are threatened by the suspension of payments or the over-indebtedness of their joint debtor" (Colović and Milijević, 2010, p. 7). As Vučković (2014, p. 56) states here, "bankruptcy is a condition that causes the disappearance of a business entity from economic life." The significance of bankruptcy for the economy and business operations of entities is very great. It is safe to say that bankruptcy provides valuable advantages not only to creditors, but also to debtors themselves.

According to Stevanović (2005, p. 15), "an effective bankruptcy system encourages risk taking by entrepreneurs, reduces economic losses, attracts foreign investments and encourages the development and increase of the wealth of the whole society". Bankruptcy legislation should help "redirect resources from uneconomic, unproductive or unprofitable enterprises to where they will be used more efficiently." It sets up a system within relocation can be carried out, but at the same time (to the extent possible in the circumstances) protects the contractual and real rights of the various parties to the proceedings, including business owners, creditors and workers. Each of these groups must bear a part of the losses caused by the bankruptcy of the company, and each of them must sacrifice a part of their interests to the redistribution of assets that are not sufficient to fully settle all" (Stevanović, 2005, p. 15). According to Article 1 of the Law on Bankruptcy (2009), "bankruptcy, in terms of this law, is implemented by bankruptcy or reorganization." Bankruptcy means the settlement of creditors from the value of the entire property of the bankrupt debtor, that is, the bankrupt debtor as a legal entity. "Reorganization" means the settlement of creditors according to the adopted reorganization plan by redefining debtor-creditor relations, status changes of the debtor or in another way provided for in the reorganization plan. Also, according to the provisions of Article 11, paragraph 1, of the aforementioned Law on Bankruptcy (2009), "bankruptcy proceedings are opened when the existence of at least one bankruptcy reason is established, whereby bankruptcy reasons include: permanent inability to pay, threatened inability to pay, over-indebtedness, failure to act according to the adopted reorganization plan and if the reorganization plan was implemented in a fraudulent or illegal manner". According to the provisions of Article 11, paragraph 2 of the same law, "a more permanent inability to pay exists if the bankrupt debtor: cannot meet his financial obligations within 45 days from the due date of the obligation; completely suspend all payments for a continuous period of 30 days. Threatening insolvency exists if the bankrupt debtor makes it likely that he will not be able to meet his pre-existing financial obligations when they fall due. Overindebtedness exists if the bankruptcy debtor's assets are less than his liabilities. If the bankruptcy debtor is a company of individuals, overindebtedness does not exist if that company has at least one partner or general partner who is a natural person. Failure to act according to the adopted reorganization plan exists when the bankrupt debtor does not act according to the reorganization plan or acts contrary to the reorganization plan in a way that significantly jeopardizes the implementation of the reorganization plan" (Bankruptcy Act, 2009). At this point, it is important to define the basic lines of bankruptcy, both in theory and in the *lex generali* law. According to Velimirović (2010, p. 25-26), "the goals of bankruptcy are realized in bankruptcy proceedings. The first goal of bankruptcy proceedings is to ensure a joint and proportionate settlement of creditors of the bankrupt debtor. This can be achieved either by reorganization and rehabilitation of the bankrupt debtor, or by his bankruptcy. Another goal of bankruptcy proceedings is the economic protection of social interests that are threatened by the irrational operation of an economic organization that cannot fulfill its economic and social obligations. Bankruptcy removes an incompetent entity from economic life, in order to prevent it from continuing to cause damage to other persons with whom it enters into business relations". According to the provisions of Article 2 of the Law on Bankruptcy (2009), "the goal of bankruptcy is the most favorable collective settlement of bankruptcy creditors by achieving the highest possible value of the bankrupt debtor, that is, his assets." However, regardless of the fact that the state, through the appropriate law, has regulated the conditions and manner of initiating and conducting bankruptcy proceedings before the appropriate court, "nevertheless, various forms of criminality appear in practice in this area, among which the following are: devaluation of capital, its incorrect assessment or incorrect presentation of real values; agreement between individuals from bankruptcy authorities and persons participating in bankruptcy proceedings as potential buyers; by the agreement of individuals from the bankruptcy authorities, valuable assets are separated from the bankruptcy estate, which enables

purchase at lower prices; entering into harmful deals for the assets of companies that are in bankruptcy" (Bošković, 2009, p. 123-124). As already emphasized in the introduction, if the tortious actions are more serious and significantly disrupt stable economic operations, abuses in the field of bankruptcy qualify as criminal acts, which are regulated by the Criminal Code of the Republic of Serbia. Special emphasis in this area is placed on fraudulent activities in the area of bankruptcy. Bankruptcy frauds are committed with the intention of avoiding payment of the obligations that the company has due to bankruptcy by apparent or real decrease in value. If it is the result of consciously negligent work or deliberate provocation, bankruptcy can be defined as a classic form of economic and financial fraud, which as such becomes one of the more significant forms of economic crime. The Criminal Code (2005) prescribes three criminal offenses in the field of bankruptcy fraud that can significantly help to see and analyze the representation of bankruptcy fraud in relation to the representation of other criminal offenses in the field of economic crime (primarily referring to the group of criminal offenses against the economy), but also in relation to the representation of bankruptcy frauds in relation to total criminality in the Republic of Serbia. These are the following criminal acts: Causing bankruptcy under Article 232 of the Criminal Code, Causing false bankruptcy under Article 232a of the Criminal Code and Damage to creditors under Article 233 of the Criminal Code. The research part of this work will analyze the representation of these criminal acts in the practice of judicial authorities in the Republic of Serbia, expressed through the following parameters: submitted criminal reports of adult persons for committing fraudulent acts in the field of bankruptcy for the period from 2019-2020. and convictions of adult persons for fraudulent acts in the field of bankruptcy for the period from 2019-2020. years. On this occasion, the representation of criminal offenses in the field of bankruptcy in the Republic of Serbia can be seen in the best way through the analysis of the official number of filed criminal reports and convictions for the said criminal offences, recorded by the Republic Institute of Statistics.

### **3. RESEARCH METHODS**

The subject of analysis in the paper is the representation of the criminal acts Causing bankruptcy from Article 232 of the Criminal Code, Causing false bankruptcy from Article 232a of the Criminal Code and Damage to creditors from Article 233 of the Criminal Code, in the practice of judicial authorities in the Republic of Serbia, expressed through the following parameters: filed criminal reports of adults persons for committing fraudulent acts in the field of bankruptcy for the period from 2019-2020. and convictions of adult persons for fraudulent acts in the field of bankruptcy for the period from 2019-2020. years. The research is based on the available official statistical data of the Republic Institute of Statistics. Within the framework of what is mentioned above, it is important to analyze the representation of bankruptcy frauds in relation to the representation of other criminal offenses in the field of economic crime (primarily referring to the group of criminal offenses against the economy), as well as the representation of bankruptcy frauds in relation to the overall criminality in the Republic of Serbia. The work is methodologically based on a theoretical analysis of relevant contemporary positions in theory, a normative analysis of legislative sources, and a quantitative analysis of statistical indicators in the domain of the research subject. The research is based on official statistical data of the Republic Institute of Statistics.

### **4. RESEARCH RESULTS**

According to the provisions of Article 232 of the Criminal Code (2005), bankruptcy is caused by a person who "in the subject of economic operations that has the characteristics of a legal entity, by irrational spending of funds or their alienation for nothing, excessive borrowing, taking on disproportionate obligations, frivolous conclusion of contracts with persons unable to pay, by failing to fulfill claims in a timely manner, by destroying or concealing property or

by other actions that are not in accordance with conscientious business practices, causes bankruptcy and thereby damages another, shall be punished by imprisonment from six months to five years". According to the provisions of Article 232a of the Criminal Code (2005), causing false bankruptcy is committed by a person who "in a business entity that has the status of a legal entity, in order for that entity to avoid paying obligations, causes the bankruptcy of that entity by apparent or real reduction of its assets, in such a way that: 1) cover up all or part of the property of the business entity, sell it ostensibly, sell it below the market value or give it away for free; 2) creates fictitious debt contracts or recognize non-existent claims; 3) business books that the business entity is obliged to keep by law, covers up, destroys or alters them in such a way that the business results or the state of assets or liabilities cannot be seen from them, or by creating false documents or otherwise presenting them in such a way that on the basis of it can be opened by bankruptcy". The perpetrator of this criminal offense will be punished with imprisonment from six months to five years. The provisions of the aforementioned article stipulate that the perpetrator will be punished with imprisonment of two to ten years, if this act has resulted in serious consequences for the creditor. According to the provisions of Article 233 of the Criminal Code (2005), damage to creditors is committed by a person who "within the subject of economic operations, knowing that the subject has become unable to pay, by paying off the debt or in another way puts the creditor in a more favorable position and thereby significantly damages another creditor". The perpetrator of this criminal offense will be punished with imprisonment from three months to three years. The same provisions provide that the perpetrator will be punished with imprisonment from three months to five years, "if, knowing that the subject has become unable to pay, and with the intention of defrauding or damaging the creditor, admits a false claim, draws up a false contract, or damages the creditor". Finally, if by committing this criminal act "large-scale damage was caused to the creditor or if, according to the injured party, forced settlement or bankruptcy proceedings were initiated because of this, the perpetrator will be punished with imprisonment from one to eight years". In the following text, the subject of analysis is the representation of the criminal acts Causing bankruptcy from Article 232 of the Criminal Code, Causing false bankruptcy from Article 232a of the Criminal Code and Damage to creditors from Article 233 of the Criminal Code, in the practice of judicial authorities in the Republic of Serbia, expressed through the following parameters: submitted criminal applications of adult persons for committing fraudulent acts in the field of bankruptcy for the period from 2019-2020. and convictions of adult persons for fraudulent acts in the field of bankruptcy for the period from 2019-2020. years. Table 1 will tabulate and analyze data in the area of the number of criminal charges filed against adults for the criminal acts of Causing bankruptcy, Causing false bankruptcy and Damage to creditors, in the period from 2019-2020. years. In the table, data from Bulletin 677 (2021) on adult offenders in the Republic of Serbia, Republic of Statistics Office, as well as Bulletin 665 (2020) on adult offenders in the Republic of Serbia, Republic Office of Statistics will be consulted.

*Table following on the next page*

	2019.			2020.		
	IN TOTAL	Known perpetrators	Unknown perpetrators	IN TOTAL	Known perpetrators	Unknown perpetrators
<b>REPUBLIC OF SERBIA</b>	92.797	64.695	28.102	74.394	51.863	22.531
<b>CRIMINAL OFFENSES AGAINST THE ECONOMY</b>	2.461	1.970	491	1.814	1.362	452
<b>Causing bankruptcy</b>	7	6	1	3	2	1
<b>Causing a false bankruptcy</b>	3	3	-	2	2	-
<b>Damage to creditors</b>	30	30	-	19	18	1

*Table 1: Criminal charges against adults according to the criminal offense, for the period 2019-2020*

Table 2 will tabulate and analyze data in the area of the number of convictions, rejections and acquittals against adults for the criminal acts of Causing bankruptcy, Causing false bankruptcy and Damage to creditors, in the period from 2019-2020. years. In the table, data from Bulletin 677 (2021) on adult offenders in the Republic of Serbia, Republic of Statistics Office, as well as Bulletin 665 (2020) on adult offenders in the Republic of Serbia, Republic Office of Statistics will be consulted.

	2019.			2020.		
	Osudjuće presude	Dismissal verdicts	Acquittal verdicts	Osudjuće presude	Dismissal verdicts	Acquittal verdicts
<b>REPUBLIC OF SERBIA</b>	28.112	897	1.465	25.487	749	1.330
<b>CRIMINAL OFFENSES AGAINST THE ECONOMY</b>	1.008	79	150	842	72	132
<b>Causing bankruptcy</b>	-	-	-	2	-	-
<b>Causing a false bankruptcy</b>	-	-	2	-	-	-
<b>Damage to creditors</b>	12	-	1	10	-	2

*Table 2: Convictions, refusals and acquittals against adults for criminal offences, for the period 2019-2020*

As can be seen, the data against which the numerically presented data for each individual criminal offense were compared are: 1.) total numerically expressed criminality in the territory of the Republic of Serbia for the given year; 2.) total values for the group of criminal offenses against the economy in which the individual criminal offenses are observed (chapter twenty-two of the Criminal Code).

## 5. DISCUSSION

The goal of the data analysis in table 1 is the representation of criminal reports for the crimes of Causing bankruptcy, Causing false bankruptcy and Damage to creditors in relation to the number of criminal reports for total criminality, for the group of crimes against the economy, as well as the analysis of the mutual representation of all three individual crimes. It can be seen that the dynamics of filing criminal charges against adults for the criminal offenses of Causing Bankruptcy, Causing False Bankruptcy and Damage to Creditors indicate that the number of criminal charges for the offense of Damage to Creditors is significantly higher compared to the

number of charges for the other two criminal offences, as well as that the number of filed criminal reports in the observed three-year period showed a tendency to decrease:

- in 2019, 7 criminal reports were filed for the criminal offense of Causing Bankruptcy, 3 criminal reports were filed for the criminal offense of Causing False Bankruptcy, while 30 criminal reports were filed for the criminal offense of Damage to Creditors.
- in 2020, 3 criminal reports were filed for the criminal offense of Causing Bankruptcy, 2 criminal reports were filed for the criminal offense of Causing False Bankruptcy, while 19 criminal reports were filed for the criminal offense of Damage to Creditors.

Then, the goal of the data analysis in Table 2 is the representation of the number of convictions, rejections and acquittals for the criminal offenses of Causing bankruptcy, Causing false bankruptcy and Damage to creditors in relation to the total number of judgments at the level of the Republic of Serbia, for the group of criminal offenses against the economy, as well as analysis of the mutual representation of the number of verdicts for all three individual crimes. It can be seen that the dynamics of passing judgments of conviction, rejection and acquittal in the observed two-year period against adults for the criminal offenses of Causing bankruptcy, Causing a false bankruptcy and Damage to creditors, do not record major oscillations:

- in 2019, not a single verdict was passed for the criminal offense of Causing bankruptcy, for the criminal offense of Causing false bankruptcy, 2 acquittals were handed down, while for the criminal offense of Damage to creditors, 12 convictions and 1 acquittal were handed down;
- in 2020, not a single verdict was handed down for the criminal offense of Causing a false bankruptcy, the criminal offense of Causing bankruptcy resulted in 2 guilty verdicts, while for the criminal offense of Damage to creditors, 10 convictions and 2 acquittals were handed down.

If we analyze the ratio of the number of criminal reports submitted for the above three individual crimes, in relation to the total criminality and in relation to the group of criminal offenses against the economy, criminal offenses have an insignificant representation, which indicates the fact that according to official data, they cannot threaten the national economic and economic stability. The same conclusion can be drawn for the rendered judgments - conviction, rejection and acquittal. On the other hand, this issue is interesting from the perspective of future criminological studies, because there is a possibility that the officially insignificant statistical representation of a certain phenomenon indicates the existence of the so-called "dark figures", which actually means that there is a possibility that a certain number of committed criminal acts in this area were not detected, nor registered in statistical databases. This possibility can certainly influence the future economic trends in national economies and is an important multidisciplinary issue, which will be dealt with not only by legal disciplines (mainly commercial law and criminal law), but also by economic disciplines.

## 6. CONCLUSION

Business entities enter into many legal relationships within which certain rights and duties arise for them. According to the fact that these duties are very often of a financial nature, it is clear that business entities enter into debt-creditor relationships primarily due to the need to provide funds that they need at a certain moment, but which they do not have at their disposal in specific circumstances. The reasons for which a debtor may fall into difficulties in business can be very different. Therefore, in the case of insolvency of the debtor, one of the solutions is certainly to initiate bankruptcy proceedings for the sake of an equal and most favorable settlement of the creditors, by realizing the highest possible value of the debtor's property.

However, regardless of the fact that the state, through the appropriate law, has regulated the conditions and manner of initiating and conducting bankruptcy proceedings before the appropriate court, in practice, various possibilities for undertaking criminal actions in this area appear. If the situation in our country is analyzed more closely, the last decade of the last century was certainly marked by the process of transition, i.e. the process of economic liberalization of the economy, and the transition from a centralized to a market economy. At the same time, transition is a process that inevitably goes along with property transformation, that is, the transition of state and social property to private property, which again opens up the possibility for various abuses and thus endangering economic activity in the state. In its first part, the paper dealt with the concept and importance of bankruptcy as an institution that contributes to safer operations of economic entities, and is equally important for both creditors and debtors. In the second part of the work, which also included the research of relevant data, the subject of analysis was the representation of the criminal offenses Causing bankruptcy from Article 232 of the Criminal Code, Causing false bankruptcy from Article 232a of the Criminal Code and Damage to creditors from Article 233 of the Criminal Code, in the practice of judicial authorities in To the Republic of Serbia, expressed through the following parameters: submitted criminal reports of adult persons for committing fraudulent acts in the field of bankruptcy for the period from 2019-2020. and convictions of adult persons for fraudulent acts in the field of bankruptcy for the period from 2019-2020. years. The conclusion that was imposed after the analysis of the data presented in the table is that not a single analyzed individual criminal offense is represented on a larger scale, bearing in mind the numerical data for the total criminality in the Republic of Serbia and the parameter for the group of criminal offenses against the economy. However, this conclusion is not absolute and final, because there is a possibility that the officially insignificant statistical representation of a certain phenomenon indicates the existence of the so-called "dark figures", which actually means that there is a possibility that a certain number of committed criminal acts in this area were not detected, nor registered in statistical databases. This points to the fact that it is necessary to further monitor the phenomenology and dynamics of criminal acts in the field of bankruptcy fraud, as well as to the fact that it is necessary to approach this problem in a multidisciplinary manner, bearing in mind that the direct criminal and criminological dimension of the problem can significantly reflect on the economic and economic stability of society.

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## INFLUENCE OF HEAVY METALS ON STEM AND LEAF IN THE INITIAL PHENOPHASE OF WHEAT – EXAMINATION IN LABORATORY FLASKS

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### **ABSTRACT**

*The interaction between potentially toxic elements and plants is important for ecosystem stability, which action will reduce the risk of their entry into the food chain. Heavy metals represent a very significant group of environmental pollutants because they are potential metabolic inhibitors. With that, a study was conducted where the content of heavy metals in the stem was examined from wheat in the budding and leafing stages and also the plant height were evaluated. The aim of the research was to determine the influence of heavy metals on the initial phenophases of wheat varieties Pobeda and Ljiljana. An experiment was set up in the laboratory flasks under controlled conditions of heat and humidity with the addition of different concentrations of heavy metal mixtures. Higher concentrations of heavy metals significantly reduced plant growth and leaf surface in both cultivars. It was proved that there was a significant concentration of heavy metals in the stems of the plant.*

**Keywords:** *atomic absorption spectrophotometry, heavy metals, Triticum sp*

### **1. INTRODUCTION**

Due to the rapid increase in the population of people on earth, the requirements for the quantity of food are increasing. However, increasing anthropogenic heavy metal deposits can reduce yield and quality products (Popović-Vukeljić, 2002). Second, no less important way of contamination alimentary products with heavy metals is the process of their production. (Mickovski-Stefanović et al., 2022). In relation to the others trace elements cadmium is extremely toxic to both plants and humans. A number of heavy metals (iron, manganese, copper, zinc) in small amounts are regarded as essential elements for the growth and development of plants. These are microelements, but in high concentrations they are toxic to plants. Some heavy metals belong to the functional group, plants adopt them and their presence in vegetative and generative organs is not toxic. Selenium, cobalt, silicon are belong to this group. Other heavy metals are toxic to plants, animals and humans plant food.

Knowledge of factors that influence the behavior and bioavailability of heavy metals in the soil is necessary. In the past period, the concentration of zinc in some lands is increasing, especially in industrialized countries as a consequence of inadequate protection the environment from factory pollution. For the dynamics of Zn accumulation, the most important factors are the pH value, CaCO<sub>3</sub> content and mechanical composition of the soil. Plants grown on contaminated soil adopt and accumulate heavy metals in their aboveground organs (Jakovljević i sar., 1997). Heavy metal have great negative impact on human health when they are found in food. In agricultural products it is demanded by law that the content of heavy metals is precisely known. In this research the analisis of regression is used to predict Cd and Pb in wheat and contributes to uncertainty in that predictions in relation to inputs in regression model. For each part of 500 x 500 m of soil which represents agricultural land in Netherlands, a 1000 samples was analised, variables were pH of soil, organic matter and concentration of heavy metals in soil. According to EU standards of quality, content of lead and cadmium in soil was higher than allowed concentrations. Uncertainty of regression analisis for cadmium (Cd) was 36% and for lead (Pb) 52% (Brus and Jansen, 2004). Elevated concentrations of cadmium cause a number of negative effects in plants, such as inhibition growth, enzyme activity, photosynthesis and changes in stomatal activity (Prasad, 1995). Toxic effects of cadmium it is reflected in its affinity to the thiol group, due to which cadmium can block it functional groups of biomolecules, the result is the inhibition of metabolic enzymatic activities plant processes, such as photosynthesis, respiration, assimilation of nutrients and transport (Ferreira et al., 2002). Higher concentration of toxic metals have impact on parameters that show capacity for photosintetic exchange of gases, such is stomeconductivity (Li at al., 2013). In research by (Hattori and Chino, 2001), the quantity and concentration of toxic elements in wheat that was grown in different tipes of soil treated with 5 concentrations of heavy metals. Soil was mixed wih CdCl<sub>2</sub> or ZnCl<sub>2</sub>. Reduction of concentration of toxic elements varied depending on tipe of soil. Wheat yeald was reduced in all tipes of soil, in different quantities depending also on tipe of soil (Hattori and Chino, 2001). Procent of absorbed heavy metals through leaves depends of chemical properties of soil. Accumulation of heavy metals in wheat exposed to different contaminants was studied. This experiments lasted 18 years on two tipes of soil. Experiments were conducted on spring wheat. Rise in soil contamination resulted in activity of enzymes in leaves and roots of wheat and increase of antioxidant protection from ions of heavy metals. Concentration of heavy metals of cadmium, zink, lead and chrome in wheat grain was significantly smaller than in straw, while in grain there were more ions of nickel and copper than in straw. In roots of wheat there was most ions of cadmium, nickel, zink and copper. pH values did not have influence on content of copper, lead and chrome in plants (Murzaeva, 2004). In China, experiment was conducted to see how does contamination with heavy metals effects plants and in which way do plants adjust to their negative effect. Inhibition of growth, damage of plant structure, decline in physiological and biochemical activities was observed. Bioavailability of heavy metals depends of many factors, such as ecological conditions, pH, tipe of element (metal) and tipe of plant. There are also studies on defencemehanisms of plants to negative effects of heavy metals, such as combining these metals with proteins and detoxifications of enzymes. This are mechanisms of protection of platns against heavy metals. As can be seen, there are two aspects of interaction, heavy metals have negative effects on plants and plants have their own meshanisms of defence against this negative effects. (Cheng, 2003). Effects of chlorimuron-oxide and cadmium on winther wheat was examined in 2006. Joint effect cadmium and chlorimuron-oxide affected wheat in regard that chlorofile formation was weaker. Wheat activated its defence mechanisms as a response to negative effects by increase in enzyme antioxidant peroxdase activity. Content of degradable proteins and peroxidase activity represent biomarkers for negative effects of chemicals on plants (Wang and Zhou, 2006).

On territory of Kosovo and Metohia, in waley of rivers Ibar and Sitnica are two significant industrial cities, Kosovska Mitrovica and Obilić. These industrial gigants pollute environment with their emmissions on wider area of Kosovo and Metohija. Heavy metals that are released from this industrial regions fall on earth surface in their unchanged or changed form, from where they are absorbed by plants and accumulated in plant tissues and organs. Plants from *Plantago* genus are indicators of contamination and have great accumulation ability of heavy metals. As distance from pollutants gets bigger, the effect of pollution with heavy metals declines. From plants that were object of experiment, the smallest accumulation was observed in tomato, green beans and the highest cabbage. Vegetables accumulate less quantities of heavy metals than fruits (Filipović- Trajković i sar., 2001). Under the influence of higher concentrations lead in the plant inhibited the main processes such as germination, growth and development, process photosynthesis, water regime, mineral nutrition, as well as enzyme activity (Agami i Mohamed, 2013; He i sar., 2016; Sharma i Dubey, 2005).

## 2. MATERIAL AND METHODS

Investigations of the influence of the concentration of the mixture of heavy metals on the dynamics of the accumulation of heavy metals in the wheat stem and the growth of the plant was performing through experiments in laboratory flasks in the greenhouse Faculty of Agriculture in Zemun where heat and humidity conditions are controlled. The vegetation experiment was set up in three replicates, with a total of 36 laboratory flasks, in wich two were sown wheat varieties *Pobeda* and *Ljiljana*. Before sowing, the laboratory flasks were filled with 2 kg of dry extract each Novobalt which was subsequently contaminated with a mixture of chemical compounds of heavy metals in the form solutions of the following compounds: zinc in the form of zinc-acetate- $\text{Zn}(\text{CH}_3\text{COO})_2 \times 2\text{H}_2\text{O}$ , lead in the form of lead acetate  $\text{C}_4\text{H}_6\text{O}_4\text{Pb} \times 3\text{H}_2\text{O}$ , chromium in the form of chromium trioxide- $\text{CrO}_3$ , copper in the form copper sulfate- $\text{CuSO}_4$  and cadmium in the form of cadmium nitrate- $\text{Cd}(\text{NO}_3)_2 \times 4\text{H}_2\text{O}$ .

The following concentrations of solutions werew used:

0 ppm (control), 50 ppm, 100 ppm

In addition to the heavy metals in the wheat stem, the height of the plants from the level was first measured soil and leaf area. After that, the concentration of heavy metals in wheat stems was determined. We chose *Pobeda* and *Ljiljana* wheat varieties because they are mostly grown in the southern region. In each laboratory flask 12 seeds were sown at a depth of 5 cm. Four plants taken from each laboratory flask. After sampling the plant, the root was manually separated from the wheat stem. After that, herbal mass-trees were previously washed with distilled water and kept for several hours in 0,1 M HCL, to remove soil and mineral oxides from the surface. Then the plant mass was ground and dried in an oven at 80° C. 1 g of the sample was poured with 20 ml of 60%  $\text{HNO}_3$ . Done is gentle boiling for 2 hours. After cooling, 3 ml of  $\text{H}_2\text{O}_2$  was added and then it was distilled boiling for 15 minutes. The procedure with peroxide was repeated. After cooling, 2 ml was added  $\text{HClO}_4$  and gentle evaporation until dense white fumes of perchloric acid appear (Jones i Case, 1990). After cooling, 5 ml of 5M HCL was added, and then the samples were quantitatively transferred into normal laboratory flask of 50 ml. The laboratory flasks filled to the final volume with distilled water. It is a solution filtered through quantitative filter paper. Reading was done by atomic absorption by spectrophotometry (Varian Spectr AA 220FS apparatus), in an acetylene/air flame. The analysis of the obtained data was done with the statistical package Statistica 8 for Windows and SPSS Statistical 17.0

### 3. RESULTS AND DISCUSSION

#### 3.1. Height of the stem

Average height was smaller in variety *Pobeda* (41,20 cm) in comparison with variety *Ljiljana* (48,00 cm). Height in samples (repetitions) varied from 39,50 cm to 42,60 cm in variety *Pobeda*, while the height in samples of variety *Ljiljana* varied from 46,00 cm to 50,00 cm (tables 1 and 2).

Variant	Zn, Pb, Cr, Cu, Cd	LSD 5%	LSD 1%
Control	42,60	7,9889	14,6647
50 ppm	41,60	8,1768	15,0097
100ppm	39,50	11,4729	21,06
Average	41,20		

Table 1: Stem height, variety *Pobeda*, cm

Variant	Zn, Pb, Cr, Cu, Cd	LSD 5%	LSD 1%
Kontrola	50,00	1,8371	3,3723
50 ppm	46,00	14,5818	26,7668
100ppm	48,00	1,8371	3,3723
Average	48,00		

Table 2: Stem height, variety *Ljiljana*, cm

When soil was contaminated with mixture of metals of concentration 50 ppm, stem height in variety of wheat *Ljiljana* was 46,00 cm and stem height of variety *Pobeda* was 41,60 cm. When soil was contaminated with mixture of metals of concentration 100 ppm, stem height in variety of wheat *Ljiljana* was 48,00 cm and stem height of variety *Pobeda* was 39,50 cm. The process of photosynthesis is most sensitive to the toxic effect of lead, long-term exposure causes inhibition chlorophyll biosynthesis (Ernst et al., 2000; He et al., 2014). Experiments have shown that lead has a negative effect on photosynthesis, transpiration and stomatal conductivity when its concentration in the soil exceeds 300 ppm (Fu i Wang, 2015). Differences in the stress-induced effects of elevated concentrations of toxic metals indicate different tolerance of plants to metals (Zhao et al., 2017).

#### 3.2. The surface of a plant leaf

Research shows that total leaf surface was bigger in variety *Pobeda* (24,38 cm<sup>2</sup>) comparing it to variety *Ljiljana* (14,10 cm<sup>2</sup>). Smallest leaf surface (15,35 cm<sup>2</sup>) in variety *Pobeda* was when the soil was treated with 100 ppm, while the biggest leaf surface was in control samples at the same variety (31,80) (tables 3 and 4).

Variant	Zn, Pb, Cr, Cu, Cd	LSD 5%	LSD 1%
Control	31,80	10,1436	18,6201
50 ppm	26,00	0,8007	1,4697
100ppm	15,35	8,8499	16,2453
Average	24,38		

Table 3: Leaf surface, variety *Pobeda*, cm

Variant	Zn, Pb, Cr, Cu, Cd	LSD 5%	LSD 1%
Control	13,18	0,6010	1,1032
50 ppm	15,10	3,4220	6,2815
100ppm	14,04	0,8114	1,4894
Average	14,10		

Table 4: Leaf surface, variety *Ljiljana*, cm

In vegetative experiment in dishes uptake and accumulation of heavy metals in different parts of salad, carrot and radish was studied. Experiment was conducted using soil that was contaminated in different amounts with heavy metals. Results showed that there was enormous accumulation of heavy metals iron, zinc, lead and cadmium, especially in leaves. Accumulated amounts were above allowed values (MDK). In soils that were examined, originating from gardens and in proximity of magistral road, higher levels of iron, zinc, lead and nickel were observed, but did not have negative effect on plant growth (Stevanović i sar., 2001).

### 3.3. Content of heavy metals in the stem of wheat

Content of heavy metals in varieties *Pobeda* and *Ljiljana* varied greatly (table 5 and 6).

By average content of heavy metals in stem of variety of wheat *Pobeda* researched heavy metals can be lined up by descending order as follows:

- Zink > Cadmium > Copper > Lead > Chrome

Cadmium content in stem of variety *Pobeda* was on average  $4,80 \text{ mg kg}^{-1}$ , but varied from  $0,65 \text{ mg kg}^{-1}$  (measured content in control) to  $8,45 \text{ mg kg}^{-1}$  (variant where 100 ppm of cadmium was applied). Zinc content in stem of both varieties was growing linearly with increasing of heavy metals applied on soil, comparing it with control sample.

By average content of heavy metals in stem of variety of wheat *Ljiljana* researched heavy metals can be lined up by descending order as follows:

- Zink > Cadmium > Copper > Lead > Chrome

Results of analysis (analysis of variance-ANOVA) showed that experimental factor-concentration of heavy metal mixture for soil contamination had very significant impact on content of same heavy metals in parts of wheat, which is shown through calculated F values.

Variant	Zn	Pb	Cr	Cu	Cd	Ftest	LSD 5%	LSD 1%
Control	19,39	2,46	1,23	4,49	0,65	38832,27**	0,1197	0,1655
50 ppm	22,80	2,78	1,63	4,13	5,20	14839,17**	0,2168	0,2998
100ppm	39,46	3,40	0,99	5,26	8,45	1094,38**	0,4569	0,6318
Average	27,20	2,90	1,30	4,60	4,80	-	-	-

Table 5: Heavy metal content in wheat stem, variety *Pobeda*,  $\text{mg kg}^{-1}$

Variant	Zn	Pb	Cr	Cu	Cd	Ftest	LSD 5%	LSD 1%
Control	29,99	2,14	0,58	4,65	0,39	38832,27**	0,1197	0,1655
50 ppm	69,93	3,13	0,64	5,05	9,45	37006,43**	0,4607	0,6372
100ppm	77,67	2,76	0,58	5,36	13,46	62999,44**	0,3917	0,5417
Average	59,20	2,70	0,60	5,00	7,80	-	-	-

Table 6: Heavy metal content in wheat stem, variety *Ljiljana*,  $\text{mg kg}^{-1}$

(Youseff and Chino, 1991) reported that the intensity of absorption of heavy metals declines on soils that have pH of 7 and higher. Heavy metal intake is around ten times higher through leaves than through root in contaminated soil and the intake of iodine is the fastest through leaves. Intake of lead from soil through root was neglectable and the conclusion is that this metal is primarily absorbed from air through leaves. Root system of plants is not only for absorption of water and nutrients, but is also has significant role in distribution of heavy metals from soil to plant.

#### 4. CONCLUSION

Vegetation trials in dishes with different concentrations of heavy metal mixtures was conducted. With rising concentration of mixture, negative effect on wheat stem height, leaf number and leaf surface was more and more pronounced. Higher concentrations of heavy metal mixture had very significant negative effect on growth (height) of both varieties, and also very negative effect on leaf surface in variety *Pobeda*.

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## LEVEL OF ELEMENTARY SCHOOL STUDENT'S KNOWLEDGE ABOUT NATURE AND THEIR BEHAVIOR IN THE ENVIRONMENT

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### ABSTRACT

*By implementing the concept of sustainable development, it is possible to improve the quality of the environment. Building environmental awareness can ensure environmental sustainability, and this is achieved through education. The research aimed to evaluate the knowledge of elementary school students about nature and to find out their behavior in the environment. Data collection was done through a survey questionnaire. The sample was made up of students in the third and seventh grades of primary schools in Vojvodina, Serbia. The results showed that the student's behavior in the environment is related to their knowledge of nature. Those who have shown greater knowledge behave more environmentally responsible. The most important source of knowledge about nature was the school, which was mentioned by 55% of the students. However, there was no direct connection between their knowledge and their living environment (rural or urban area) or the frequency of being in nature. 2/3 of the students completely agreed with the statement "I like nature". Also, over 70% of students are interested in what is happening to the environment. Almost 4/5 respondents believe that they are environmentally conscious, with thirds being more aware than sevenths. 74% of students agreed with the statement that they generally behave in an environmentally responsible manner, and third-graders also show greater responsibility, as do children from urban areas. There were no big differences between the answers to the statements about the principles of sustainable development and the environmental acceptability of students' habits, but between higher and lower grades the differences are noticeable. The average grade of knowledge about the nature of the third-grade students was 3.0, and 3.3 for the seventh-grade students. In general, we can be satisfied with the student's knowledge of nature. The behavior of young people in the environment is determined by knowledge, which also depends on their exposure to nature and the frequency of being in nature. In the conclusion, for students to become more interested in the environment, improve their knowledge of nature and ecology, and behave more environmentally responsible, learning should be practiced outdoors. Also, the media must play a more pronounced role in the transfer of knowledge to young people, as must parents.*

**Keywords:** Ecology awareness, Ecology, Environment, Knowledge about nature, Students

### 1. INTRODUCTION

In recent decades, there has been an increased interest in the preservation of the environment. By accepting the Rio de Janeiro Agenda (1992), humanity opted for the so-called concept of sustainable development. This does not only mean sustainable economic development, but also social, cultural, and environmental sustainability. The primary objective of the National Environmental Protection Program (2010) is to improve the management of the environment and natural resources based on the principles of sustainability. For this purpose, the improvement of the institutional framework, monitoring activities, the preparation of studies, and the financing of projects in the field of environmental protection, as well as information, education, and capital investments are foreseen (Vlada RS, 2010).

Despite the advocacy for the introduction of an ecological paradigm in the Republic of Serbia at the level of institutions and legislation, there is no profiling of "green political" ideology (Pajvančić and Ristić, 2011). It was finally realized that action must be taken to preserve the ecosystem. A large number of initiatives and programs have been launched with this goal in mind. Although it seems that some more influential countries ignore ecology, they invest huge financial resources and provide educational programs, to provide a solid basis for engagement in the ecological sphere and preserve the environment (Iizuka, 2016; Mihailović et al., 2019). Ecology is a science that studies the relationships between living things, as well as the relationships between them and their environment. Those relations are significantly damaged today. In this context, ways are considered that can be effective in directing activities in the environment in the desired direction, putting them under control and thus excluding major risks. In this context, it would be important to develop a general level of environmental awareness. Environmental awareness is the understanding that the environment is very important, which is formed by the interaction and influence of several factors and is manifested as environmental behavior (Abun and Racoma, 2017). Environmental awareness can prevent negative processes in the environment and promote environmental sustainability (Iizuka, 2016). We are witnessing the fact that undesirable processes of species extinction are taking place in nature. We have an important task ahead of us, which is to preserve the environment. Human behavior in the environment must be changed or adapted. It is believed that children should be taught about nature and the environment from an early age. Building environmental awareness can improve environmental sustainability. Ecology is studied at some higher education institutions in our country. However, it seems that as a nation we are insufficiently ecologically conscious. Ecology students show great concern for the environment, so a logical question arises: should ecology be studied throughout the entire education system (Šehović, 2012; Ardoin, et al., 2020)? The impetus for research on environmental awareness and students' knowledge of nature, ecology, and the environment comes from everyday life, which is characterized by the irresponsible environmental behavior of citizens, often also decision-makers. Although some research results indicate that there is not enough consistency between knowledge about ecology, value systems, and ecological behavior (Pajvančić and Ristić, 2011), we believe that acquiring knowledge and developing ecological awareness among young people is an important task. The work aims to evaluate the knowledge of nature and ecology by elementary school students and to find out their behavior in the environment.

## 2. LITERATURE REVIEW

Research among students shows that their daily habits were more environmentally friendly if they had more knowledge about nature (Zajicek et al., 1999; Harun et al., 2011). Pajvančić and Ristić (2011) found that about 30% of respondents do not have developed environmental awareness, which is a prerequisite for environmental behavior. The results also suggest that environmental behavior is not rooted in people's values. The only exception is the representatives of the oldest age group, which cherishes traditional values (Primc et al., 2021). PISA (*Programme for International Student Assessment*) is the most famous educational survey, which measures the knowledge and skills of students aged 15 in three areas: mathematics, functional reading, and natural sciences (Sjøberg, 2015). In the PISA 2009 survey, the results of students from Serbia were satisfactory - about 60 points lower than the OECD average. Our students scored an average of 442 points. If 400 to 600 points is an average, then the achieved result can be interpreted as good. There was a noticeable decrease in the number of functionally illiterate compared to the previous survey (by almost 20%), and progress was also recorded in terms of mathematical and scientific literacy, which is encouraging (Baucal and Pavlović-Babić, 2010). Research on the environmental awareness of the population was conducted by Pajvančić and Ristić (2011), using a questionnaire, on a sample of 364

respondents from five towns in AP Vojvodina. Environmental awareness was analyzed through cognitive, value, and action dimensions. The inconsistency of the dimensions of ecological awareness, i.e. the difference between ecological knowledge, values, and behavior, was confirmed. Such a difference has already been theoretically confirmed, and Bell defines it as the "A-B split" ("attitude-behavior split") (Bell, 1998). The respondents have solid environmental knowledge and values, but a significantly weaker potential for social mobilization in the field of environmental protection. The environmental awareness of the respondents is largely localized and reduced to the knowledge of environmental problems in the immediate environment (Pajvančić and Ristić, 2011). One study reveals that the majority of the population considers themselves environmentally conscious. Among the environmentally acceptable activities, the most common practices are buying food every day, taking care not to throw it away, taking hazardous waste to a designated place, and sorting garbage. The least participation is in joint activities related to environmental protection and the purchase of organic products (Joshi and Rahman, 2015; Ting et al., 2019). The most important information channel for obtaining information about the environment is still television, although the Internet is also gaining importance, especially among the young generation (Saari et al., 2020). Research by Stevenson et al. (2013) among elementary school students in North Carolina showed that students' environmental literacy was directly related to their teachers and the length of time they spent outside (including nature classes). The group of students whose teachers had 3 to 5 years of work experience had better test results than the group whose teachers had less than 3 years or more than 5 years of experience. In the first case, it was considered that the experience was limited, in the second case, it was about "burnout" or the loss of motivation of the teacher. Students whose schools actively used outdoor learning opportunities also had significantly higher environmental literacy (Palmberg and Kuru, 2000). It has been observed that outdoor learning has a greater impact on younger students than on older ones (Stevenson et al., 2013; Yıldırım and Akamca, 2017). Through outdoor learning, children gain direct experiences, and self-knowledge and are more interested in sharing experiences. Outside the classroom, students are more likely to learn new things and are more motivated to ask questions (Usher and Kober, 2013; Gray, 2018). Outdoor learning activities should be such that the student can experiment and thus gain new knowledge and experiences (Gray, 2018). Outdoor learning has not taken off in the Republic of Serbia, and it is practiced on a very small scale.

### **3. RESEARCH METHOD AND QUESTIONNAIRE CONSTRUCTION**

A semi-structured questionnaire was used to collect data. The survey questionnaire was designed to ensure a greater number of responses. The survey was anonymous, respondents were differentiated by gender and age. The survey consisted of three parts. The first part consisted of questions about the respondent's age, place of residence, and daily habits. The second part consisted of questions to assess the respondent's knowledge of nature, and the third part included questions based on the answers of which it would be possible to assess the environmental behavior of the respondent. The questions are designed to be quite simplified, to make them understandable to third-grade elementary school students. The research was sampled using a combined method - snowball method and convenience sample (Browne, 2005). The sample included third and seventh-grade students from 7 elementary schools located in the city of Novi Sad and from the wider area of the city of Novi Sad. We forwarded the survey to school principals, and they passed them on to class teachers or directly to students. The research was conducted in May 2022 in the Internet environment. A total of 127 students responded to the survey, 57 third graders and 70 seventh graders. To assess students' knowledge of nature, the survey included open-ended questions asking them to name as many common species of plants and animals as possible. When assessing students' knowledge, we took into account the number of species and names they mentioned.

Then a scale was created, where the maximum value was the largest number of species listed by one student and the minimum value was the smallest number of species listed. According to the placement on the scale, each student received a grade from 1-5, with "5" being the highest and "1" the lowest grade. In the third part of the survey, activities for students are listed, which could be classified as environmental and attitudes, which show the attitude of students towards themselves, as environmentally conscious persons. If the student answered that he completely agrees with the statements, he is considered to be environmentally conscious, if the student agrees with the statements about ecological activities, he is considered to have environmentally friendly behavior. The Microsoft Excel program was used for data processing, along with statistical software Statistica 13.

## 4. RESEARCH RESULTS

### 4.1. The structure of respondents and their habits in their free time

Of the third graders, 52% were boys and 48% were girls, 40% of the seventh graders were boys and 60% were girls. 56% of respondents live in cities, 34% in rural settlements, and 10% outside settlements. 54% of third graders and 47% of seventh graders live in the city. The responses did not show a significant difference between school levels, but there was a gender difference.

### 4.2. Knowledge of the environment by students

Students were asked to name as many different fish, birds, mammals, trees, poisonous plants, medicinal plants, and protected parts of nature as possible. The results differed less between sexes than between ages. The third-grade student, who listed the most for all questions, actually listed a total of 63 names, while those who listed the least listed only 6 names. Third graders listed an average of 18 names. Birds and trees are listed the most, while nature reserves and protected plant species are listed the least. One student in the seventh grade listed a total of 97, and one listed only 7 names. On average, the seventh graders listed 26 names, 8 more than the students of the third grade. Birds and mammals were listed the most, and nature reserves and poisonous plants the least. Table 1 shows the number of names given by the best and worst students, as well as the average number of names and the most frequently mentioned answers.

	Grade	Max	Min	Average	The most frequent answers
Fishes	III	7	0	3.5	Carp, pike
	VII	21	2	4.7	Carp, catfish
Mamals	III	13	0	4.0	Wolf, dog
	VII	30	1	5.9	Wolf, wild boar
Birds	III	23	2	4.8	Crow, swallow
	VII	36	2	5.7	Swallow, sparrow
Trees	III	19	2	4.7	Oak, acacia
	VII	13	1	5.8	Oak, birch
Poison plants	III	5	0	1.1	Ficus
	VII	6	1	1.6	Banat peony
Medicinal plants	III	14	1	2.5	Mint, basil
	VII	13	0	2.4	Chamomile
Protected species	III	7	0	1	Bant peony, sedge grass
	VII	11	1	2.4	Fennel grass, elder
Nature reserves	III	6	0	0.6	Fruška gora national park
	VII	5	2	1.5	Fruška gora national park, Begečka jama

Table 1: Correct most frequently mentioned answers

According to their knowledge, students were rated on a scale from 1 to 5. 13% of students answered with "1", 30% of students got "2", 26% of students answered with "3", 12% of students answered with "4" and 19% of students answered with "5".

The most important source of knowledge about nature for students was school, which was mentioned by 55% of students. 12% of students got their knowledge from their parents, 14% from the Internet, and 6% from books. 13% of students used the answer "other" here. Grandparents, television, and shows about nature were mentioned as concrete answers.

#### 4.3. Student behavior in the environment

For most of the questions related to environmental behavior, the answers of third and seventh-graders differed. There were also minor differences between the responses of boys and girls. 69% of students completely agreed with the statement "I love nature". 72% of third-grade students and 55% of seventh-grade students fully agreed with this statement. 60% of boys and 72% of girls completely agree with the statement (Figure 1).

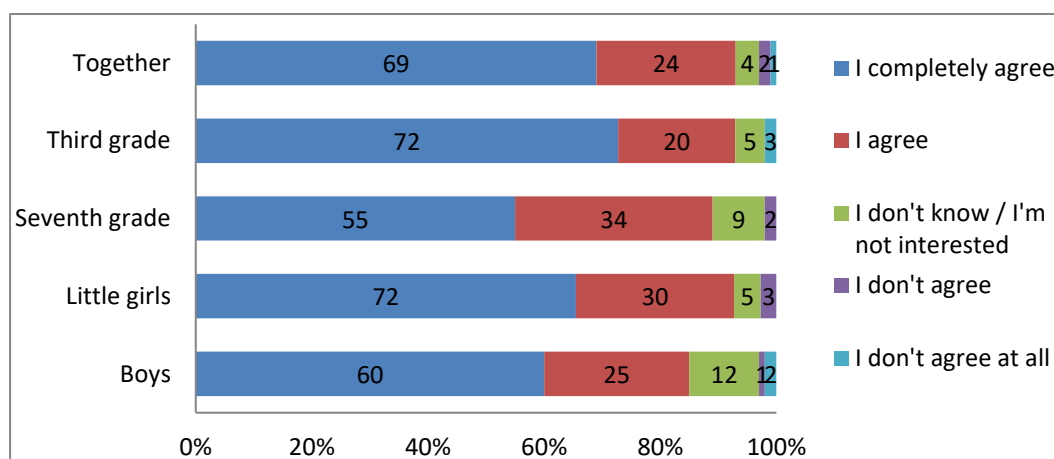


Figure 1: „I love nature“

75% of third graders and 60% of seventh graders agreed with the statement "I am interested in what is happening to the environment". There were no significant differences between boys and girls in this aspect (Figure 2).

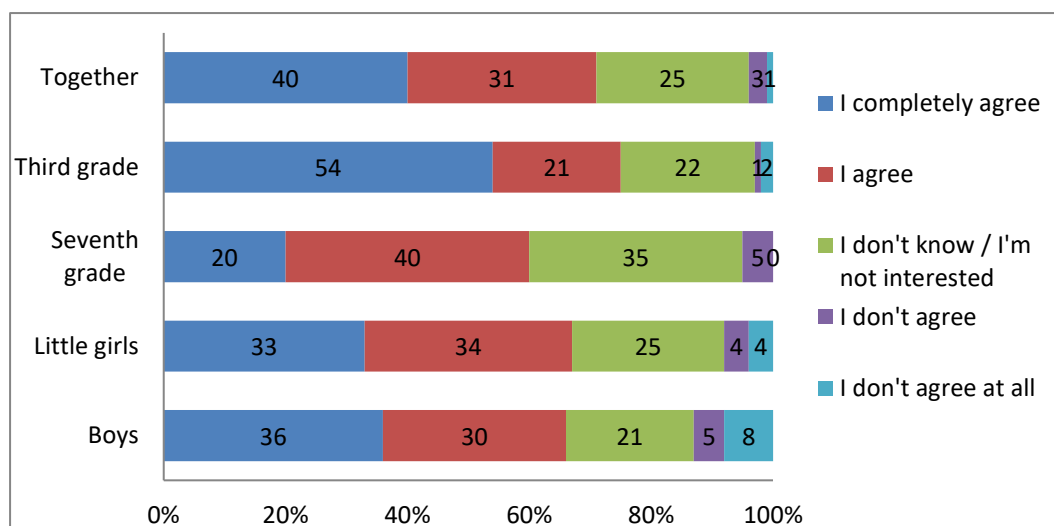


Figure 2: „I am interested in what is happening to the environment“

28% of respondents consider themselves to be completely environmentally conscious person. The respondents are distributed differently: 78% of third-graders consider themselves more or less environmentally conscious, compared to 62% of seventh-graders. 69% of boys and 72% of girls consider themselves environmentally conscious.

At the same time, there were no girls who disagreed with this statement, while 7% of boys answered that they did not agree with the statement at all (Figure 3).

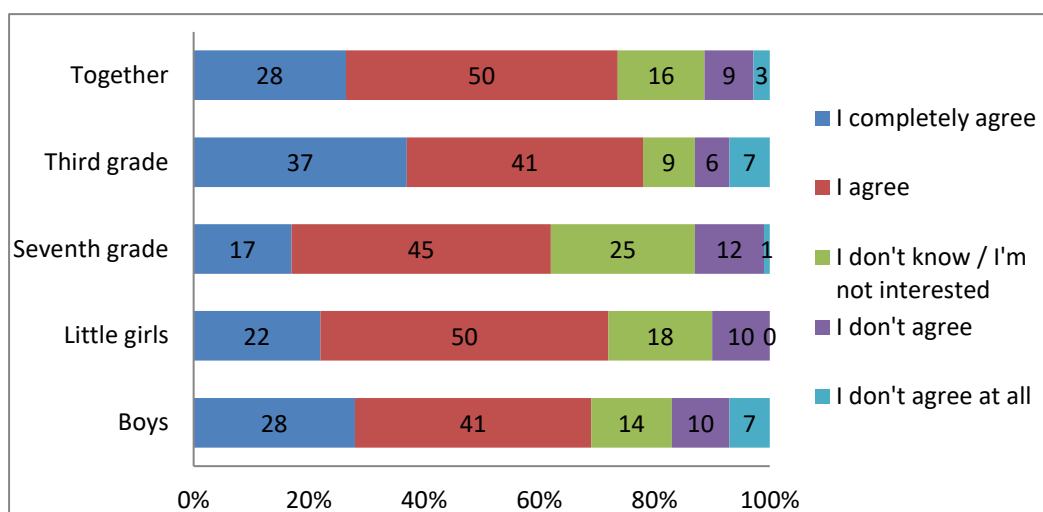


Figure 3: „I am an environmentally conscious person“

74% of students agreed with the statement that they mostly behave ecologically. 68% of seventh-grade students rated their behavior as ecological, as did 83% of third-grade students. 72% of boys claim that their behavior in the environment is environmentally acceptable and even 79% of girls. There were slightly more boys than girls who disagreed with this statement (Figure 4).

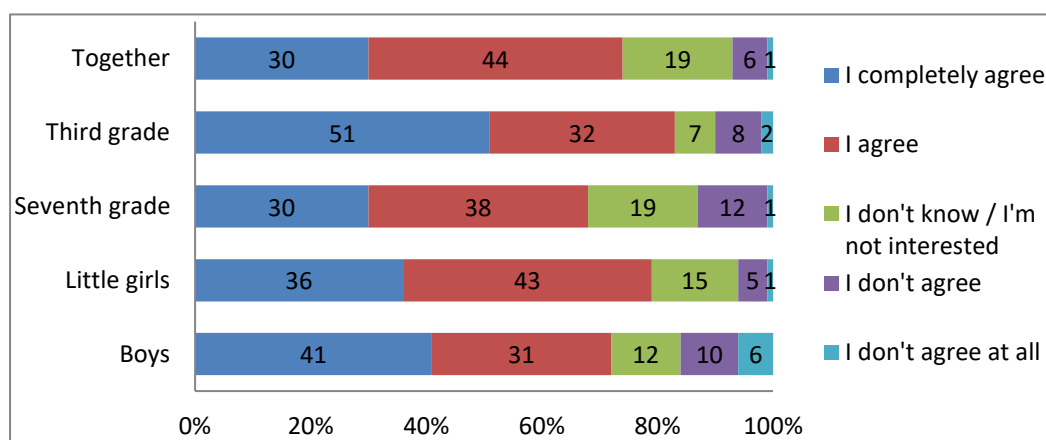
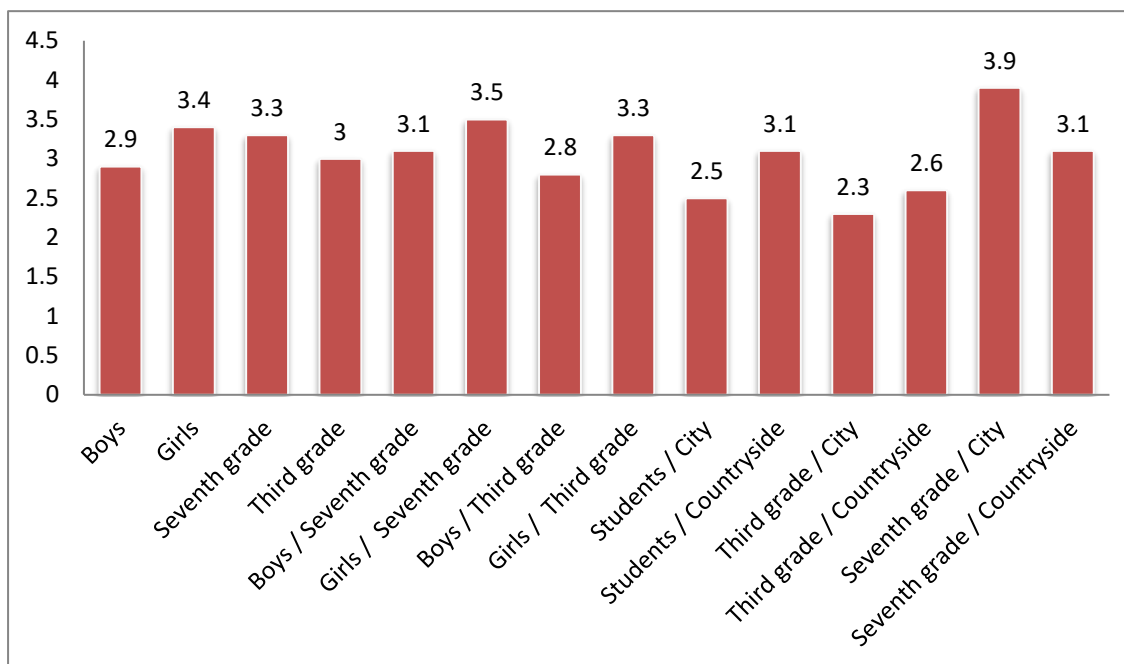


Figure 4: „I behave ecologically“

There were no big differences between the answers of boys and girls to statements about the principles of sustainable development and the environmental acceptability of student habits. However, the differences between the two classes were quite large. While the behavior of third graders can be rated as quite environmentally friendly, this is not the case for seventh graders. The biggest difference is in terms of garbage disposal. While 85% of third graders said they would not litter the environment, this figure was only 47% for seventh graders. There is a higher share of thirds in the aspect of saving energy at home (64% vs. 30%), riding bicycles or walking compared to using means of transport (52 vs. 34%), consuming water from the tap compared to bottled water (70 vs. 41%). City children more often agreed with the statements "I love nature" (66% vs. 58%), I am an environmentally conscious person (46% vs. 22%) and I behave responsibly in the environment (80% vs. 66%).

The average grade of students in the third grade was 3.0, and that of the seventh grade was 3.3. Overall, the average scores for boys and girls were 2.9 and 3.4, respectively. In the third grade, the average grade was 2.8 for boys and 3.3 for girls. In seventh grade, the average scores were 3.1 for boys and 3.5 for girls.



*Chart 1: Average score of students*

The average score of students living in the city was 2.5, while the average score of students living in the countryside was 3.1. For third graders, these figures were 2.3 and 2.6, respectively. In seventh grade, the results were slightly different: the average score of students living in urban areas was 3.9, and the average score of students living in rural areas was 3.1.

## 5. DISCUSSION

The results revealed that there were gender differences. The average score of boys and girls differed by 0.5 points in favor of girls. Girls show better theoretical knowledge. A possible reason for this is that girls are more responsible than boys. In general, we can be satisfied with the student's knowledge. The students listed a relatively large number of fish, birds, mammals, and trees. However, the lack of knowledge about poisonous plants and protected species is a little worrying. As for the goals set in the curricula, it can be said that they were met already at the lower level of primary education because the students knew how to name the common plant and animal species, behave naturally, and are interested in the environment. Research shows that students of lower grades are more environmentally aware and consider environmental issues more important than students of higher grades of primary education. The question about environmental habits also showed that the environmental behavior of third graders was more likely to be more environmentally friendly than seventh graders. Therefore, one gets the impression that as education progresses, more emphasis is placed on the realization of new goals. Although the theoretical framework states that television is the main source of knowledge about nature and the environment, the obtained results say that it is a school. Apropos of the above, teaching programs could place greater emphasis on knowledge of nature, which would certainly contribute to an increase in teaching hours in nature. It can be argued that the environmentally friendly behavior of young people depends on their knowledge of nature.

According to the place of residence, the results were different between the first and second levels of primary education. In the third grade, the average grade of students who live in the countryside was higher, but in the seventh grade, the average grade was higher among children who live in cities. That difference is due to the greater influence of the school and the environment, but we have no proof for this claim. In general, the knowledge of older students about nature was slightly better than that of younger students, which corresponds to the levels of the curricula and is therefore not surprising. Somewhat surprising was the fact that children who live in the city are considered more environmentally conscious and behave more environmentally responsible than children who live in the countryside, although the average score was higher for children living in the countryside. The results showed that third graders considered themselves more environmentally conscious and behaved more environmentally friendly than seventh graders. Pivello et al. (2018) state that in terms of environmentally acceptable habits, the adult population is more environmentally responsible than the average student. This is because adults are also motivated by economic aspects, such as power saving. Children do not earn money and do not participate in costs, and are not motivated to behave more environmentally responsible. The fact that third-grade students are more interested in what is happening to the environment and that they behave more environmentally friendly than older students is worrying. It would certainly be worth further research into the reasons for the indifference of older students toward the natural environment. Students who cited the Internet as their main source of information received the lowest average scores compared to the others. The highest average grade was obtained by students who acquire knowledge mainly from books. This may be due to the abundance of information available on the Internet, which is difficult to distinguish and separate from the irrelevant. However, the difference may also be related to gender structure. Boys read books less (Uusen and Muursepp, 2012). Students, who consider themselves environmentally conscious, received a slightly higher average score than students who do not know how to take a position on this topic or do not consider themselves environmentally conscious at all. This, in turn, is confirmed by the results of previous studies, i.e. students with better knowledge are more interested in environmental issues and are more likely to behave in more environmentally friendly (Harun et al., 2011; Palmer, 1998; Zajicek et al., 1999).

## 6. CONCLUSION

The student's behavior in the environment is related to their knowledge of nature. Students who have demonstrated greater knowledge behave more environmentally responsible. The key result is that students' attitudes towards the environment and environmentally friendly behavior are directly related to their knowledge. There were no major differences between boys and girls in terms of sustainable outdoor habits, but there were differences between education levels. Third graders are more interested in the environment and also say they are more environmentally conscious. A comparison of the knowledge of students who live in urban and rural areas did not reveal significant differences, but students who live in the city more often considered that they are completely environmentally aware and that they mostly behave ecologically. The most important source of knowledge about nature was the school. Two-thirds of the students declared that they love nature and are interested in what is happening to the environment. Almost 4/5 respondents believe that they are environmentally aware and claim that they mostly behave ecologically. Third-grade students express greater environmental responsibility, as do city children. There is a lot of room for improving students' knowledge of ecology and improving environmental behavior. For students to become more interested in the environment, improve their knowledge of ecology, and behave more responsibly towards nature, outdoor learning and multimedia teaching content should be practiced. Also, the media must play a more pronounced role in the transfer of knowledge to young people, as well as parents.



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## ROLE OF FINANCIAL SERVICES IN THE SUSTAINABLE ECONOMIC DEVELOPMENT

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### ABSTRACT

*Due to the importance of financial services in the economic development of a country, the subject of our research is the analysis of the international turnover of financial services with the aim of pointing out dynamic changes and key factors of change. For the purposes of the research, data from the International Trade Center on the movement of exports, imports and the balance of foreign trade exchange of financial services at the global level and in the Republic of Serbia has been used. The research covers the period from 2010 to 2019. The percentage share of the export of financial services in the total export, and the dynamic movements of the foreign trade exchange of financial services, as well as the oscillations in five-year periods, have been analyzed. The findings indicate that at the global level there is a significant increase in the export of financial services compared to the import, which is accompanied by a surplus. Regarding the Republic of Serbia, the situation is far less favorable, i.e. the deficit of foreign trade exchange in financial services is the result of a far more significant increase in imports compared to exports, in the analyzed period. Explicitly charged and other financial services have dominated the import structure of financial services.*

**Keywords:** *financial services, economic development, foreign trade exchange, Republic of Serbia*

### 1. INTRODUCTION

In recent decades, the service sector occupies an increasingly important place in the modern business environment. This sector is characterized by a significant increase in employment (Ennew & Waite, 2007). Milosavljević, Gavrilović–Gagović and Gagović (2015) point out that the trend of liberalization of international trade, as well as the development of modern technology that is applicable in the service sector, has favored the greater interchangeability of various services and the intensification of competition between countries (p. 188). Services have significantly stimulated economic growth, especially in the economies of developed countries, as the wellbeing in society leads to a higher demand for services than the demand for goods (Ignjatijević & Vapa-Tankosić, 2021). Due to the importance of financial services in the economic development of a country, the subject of our research is the analysis of the international turnover of financial services with the aim of pointing out dynamic changes and key factors of change, on a global level and in the Republic of Serbia.

### 2. LITERATURE REVIEW

Hanić and Domazet (2012) emphasize that financial services include life and non-life insurance services, banking services, deposit operations, financial leasing, credit operations, foreign exchange operations, emission operations (issuance of securities and their handling), depot operations (keeping cash and securities and handling to them), transactions with effects

(purchase and sale of securities), guarantee transactions (issuance of guarantees, guarantees, endorsements), payment transaction transactions, brokerage transactions, i.e. securities trade mediation, purchase and collection of receivables, other financial services such as forfeiting, factoring, leasing, financial consulting, financial engineering, etc.. Samardžić and Gavrilović-Gagović (2012) note that the services based on modern information and communication technology, financial services, insurance services, and the like, are an increasingly important subject of foreign trade exchange. As they participate in the creation of GDP and the competitiveness of the economy, these services represent a support for the development of the Serbian economy (Ristić et al, 2021). The key to success is, among other things, cooperation with companies in the world that possess modern "know-how", attracting foreign investors, as well as the development of the domestic education system that will provide highly educated personnel in that field. (Milosavljević et al., 2015; Grbić & Jovanović, 2020). Ignjatijević, Matijašević and Carić (2011) point out that the developed financial market enables smooth payment transactions, mobilization of deposits and financing of investments. Indicators measure the use of different sources of financing, use of financial markets, use of financial services, measure the percentage of companies with bank loans, measure the percentage of companies with financial reports and accounts. Information and communication technologies are the driver and carrier of economic development, while innovation contributes to increasing production, exports and the competitiveness of the economy as a whole. Western Balkan exporters are on the markets of the EU and countries of CEFTA with their exports gradually increasing, following the process of transition towards a functional market economy while CEFTA region is significantly more important for the Republic of Serbia as an export market than import market (Vapa Tankosić et al., 2013). We can conclude that the volume of exports of financial services in the period 2007-2009, was at a very low level in most CEFTA countries, i.e. the volume of exports of financial and insurance services was relatively small - below 200 million euros per year (Handžiski & Šestović, 2011). The openness of the economy is a key factor in sustainable economic growth, whether in developing or developed countries. Ali et al. (2021) addressed the issue of the relationship between exports and economic growth in Bahrain for the period 1986 to 2018 and how their findings indicate that there is no causal relationship between exports, capital imports and economic growth. They point out that such a conclusion should encourage the government to create a policy to control international trade in capital and financial services in order to avoid unsustainable economic growth. Cheng and Xiao (2011) indicated that China's financial services industry developed rapidly in the period of 2000-2010, but the competitiveness of financial services trade is relatively weak. They point out that it is a period of high inflow of foreign capital or FDI, which is positively correlated with the import-export of service trade.

### **3. MATERIALS AND METHOD**

Financial services have been a significant segment of the service sector for many years. The research examined financial services: 7.1. Financial intermediation services indirectly measured (FISIM) and 7.2. Explicitly charged and other financial services in the world and in Serbia. Due to the importance of financial services in the business of domestic countries and at the global level, the subject of the research is the analysis of the international turnover of financial services in the period from 2010 to 2019. For the purposes of the research, ITC (International Trade Center) data on the movement of exports and imports of financial services at the level of the world and the Republic of Serbia were used. The data of the ITC center for export and import of services in general and services of the financial sector were used in the research. Different methods were used in the work in order to ensure basic methodological requirements, reliability, objectivity and systematicity.

#### 4. RESULTS AND DISCUSSION

Table 1 shows foreign trade in services at the global level. The average value of service exports in the period 2010-2019 is \$5,082,044 million. Within the export of services, the export of financial services ranks sixth and averages \$450,424 million, while the value of imports is \$221,065 million. Considering the more significant exports at the global level, a surplus is realized in the average amount of \$229,359 million per year. The percentage increase in exports in 2019 compared to 2010 is 46.82%, and imports 56.6%, and the surplus also had an increasing trend (37.9%).

Rank	Service name	Value in 2010	Average 2010-2014	Average 2015-2019	Value in 2019	Average 2010-2019	Percentage of increase 2019/2010
<b>EXPORT</b>							
	Total services	3,962,021.8	4,625,300.6	5,538,787.7	6,097,846.9	5,082,044.1	53.91
6	Financial services	348,665.9	416,427.2	484,421.6	511,895.3	450,424.4	46.82
<b>IMPORT</b>							
	Total services	3,888,733.6	4,515,511.4	5,297,952.8	5,746,618.8	4,906,732.1	17.12
7	Financial services	166,181.8	195,503.2	246,627.1	260,242.2	221,065.1	56.60
<b>BALANCE</b>							
	Financial services	182,484.1	220,924.1	237,794.5	251,653.1	229,359.3	37.90

*Table 1: Values of exports, imports and the balance of trade in services in the world in the period 2010-2019 (in \$ million)*

*(Source: <https://intracen.org/resources/trade-statistics> -ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities' statistics)*

Structure of export and import of Serbian services in the period from 2010-2019 is shown in Table 2. The results of the research indicate the unfavorable position of the financial services sector. The average value of the export of services (total) is \$ 5,197,414 thousand, and the export of the financial services sector is an average of \$35.9 million, and the value of the import is \$80.37 million. A significant value of imports indicates a deficit in the amount of \$44.38 million per year. In the period 2010-2019, the export of financial services increased by 14.61%, and the import by 127.38%.

*Table following on the next page*

Rank	Service name	Value in 2010	Average 2010-2014	Average 2015-2019	Value in 2019	Average 2010-2019	Percentage of increase 2019/2010
<b>EXPORT</b>							
	Total services	3,519.7	4,258.57	6,136.26	7,796.10	5,197.41	121.5
12	Financial services	36.63	38.78	33.21	37.42	35.99	14.61
<b>IMPORT</b>							
	Total services	3,533.63	3,984.79	5,086.28	6,624.75	4,535.54	87.47
12	Financial services	58.307	74.99	85.76	132.58	80.377	127.38
<b>BALANCE</b>							
12	Financial services	-21.681	-36.21	-52.56	-95.16	-44.385	338.93

*Table 2: Values of exports, imports and the balance of exchange of services in Serbia in the period 2010-2019 (in \$ million)*

*(Source: <https://intracen.org/resources/trade-statistics> - ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities' statistics)*

According to the ITC methodology, services are further classified into: 7.1. Financial intermediation services indirectly measured (FISIM) and 7.2. Explicitly charged and other financial services. The continuation of the research is devoted to the analysis of exports and imports of two sub-sectors of the financial services sector. In relation to this classification, Table 3 shows the values of exports, imports and balance of exchange of financial services in the world in the period 2010-2019. The total value of export and import of financial services indicates the dominance of 7.2. Explicitly charged and other financial services, with a decrease at the rates of 14.21% and 37.92%, respectively, in 2019 compared to 2010. In the first and second five-year periods, there was an increase in the export of financial services, which was followed by an increase in imports, but at a lower rate. Such export tendencies resulted in a surplus worth \$53,080 million for subgroup 7.1. (Financial intermediation services indirectly measured (FISIM)) and a surplus of \$171,556.1 million for subgroup 7.2. (Explicitly charged and other financial services). Average export value of subgroup 7.1. (Financial intermediation services indirectly measured (FISIM)) for the analyzed period indicates a decrease in value of 7.35% in 2019 compared to 2010 and an average value of \$67,082 million. Import values for subgroup 7.1. were also reduced, i.e. a reduction of 58.3% was achieved in the analyzed period. Average value of import of financial services of subgroup 7.2. was \$34,954.9 million. Average export value of subgroup 7.2. (Explicitly charged and other financial services) for the analyzed period indicates a decrease in value of 14.21% in 2019, compared to 2010 with an average value of \$316,014 million. Import values for subgroup 7.2. were also reduced, i.e. a reduction of 37.92% was achieved in the analyzed period. The average value of import of financial services of subgroup 7.2. was \$144,458 million.

*Table following on the next page*

Ran k	Service name	Value in 2010	Average 2010-2014	Average 2015-2019	Value in 2019	Average 2010-2019	Percenta ge of increase 2019/201 0
<b>EXPORT</b>							
7.1.	Financial intermediatio n services indirectly measured (FISIM)	45,844,386	63,608,484	70,556,231	67,082,358	42,474,959	-7.35
7.2.	Explicitly charged and other financial services	251,880,047	305,823,081	326,205,558	316,014,319	216,089,153	-14.21
<b>IMPORT</b>							
7.1.	Financial intermediatio n services indirectly measured (FISIM)	33,581,679	35,969,585	33,940,248	34,954,916	14,002,352	-58.30
7.2.	Explicitly charged and other financial services	112,928,407	133,867,125	155,049,244	144,458,184	70,111,110	-37.92

*Table 3: Values of exports and imports of financial services in the world in the period 2010-2019 (in thousands of \$) classified by 7.1. and 7.2.*

*(Source: <https://intracen.org/resources/trade-statistics> -ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities' statistics)*

In the continuation of the research, the dynamics of export and import of the financial services sector in the Republic of Serbia were analyzed, which is shown in Table 4. The data indicate the export of subsector 7.2. and imports of both subsectors. However, both sub-sectors have a deficit in the analyzed period, namely \$-23,142 million (for sub-sector 7.2) and \$21,813 million (for sub-sector 7.1). The initial value of exports of financial services of sub-sector 7.2 was \$36.63 million and with some fluctuations it was \$37.42 million in 2019, an increase of 2.16%. The average value of exports in the entire analyzed period amounted to \$35.42 million. The initial value of import of financial services of sub-sector 7.2 was \$46.75 million and with some oscillations it was \$114.86 million in 2019, an increase of 145.69%. The average value of exports in the entire analyzed period amounted to \$58.57 million. In second place in terms of the value of the import of financial services are the services of subgroup 7.1. Initial value of import of financial services of subsector 7.1. was \$11.56 million and \$17.72 million in 2019, with an increase of 53.31%. The average value of exports in the entire analyzed period amounted to \$21.81 million.

*Table following on the next page*

Rank	Service name	Value in 2010	Average 2010-2014	Average 2015-2019	Value in 2019	Average 2010-2019	Percentage of increase 2019/2010
<b>EXPORT</b>							
7.2.	Explicitly charged and other financial services	36,626	25,355	32,068	35,424	37,417	2.16
7.1.	Financial intermediation services indirectly measured (FISIM)	/	/	/	/	5,684	/
<b>IMPORT</b>							
7.2.	Explicitly charged and other financial services	46,750	53,147	63,984	58,566	114,861	145.69
7.1.	Financial intermediation services indirectly measured (FISIM)	11,558	25,355	21,779	21,813	17,720	53.31

*Table 4: Values of exports and imports of financial services in the Republic of Serbia in the period 2010-2019 (in thousands of \$) classified by 7.1. and 7.2.*

*(Source: <https://intracen.org/resources/trade-statistics> - ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities statistics)*

The results of the analysis shown in Table 5 indicate that the total value of exports of financial services from Serbia in 2019 increased compared to 2010. At the global level, an increase of only 2.16% was achieved, while exports to EU countries decreased at a rate of 1.34%. If Austria and Germany are excluded, where there is an increase in exports, exports to other countries have decreased.

Importing countries	Export in 2010	Average 2010-2014	Average 2015-2019	Export in 2019	Average 2010-2019	Percentage of increase 2019/2010
World	36,626	38,779	32,068	37,417	35,424	2.16
Europe	35,793	35,958	25,276	N,A,	31,952	-15.06
European Union (EU 28)	23,862	30,360	24,007	23,543 (2018)	27,536	-1.34
Austria	5,303	6,177	6,319	7,882 (2017)	6,230	48.63
Belgium	N,A,	1,328	1,114	1,126 (2017)	1,199	-15.27
Croatia	N,A,	1,349	1,126	1,126 (2017)	1,293	-18.99
Cyprus	1,326	2,226	1,126	1,126 (2017)	1,951	-15.08
France	1,326	1,589	1,114	1,126 (2017)	1,411	-15.08
Germany	2,651	4,501	3,717	4,504 (2017)	4,207	69.90

*Table 5: List of importing markets for a service (7.2) exported from Serbia 2010-2019. (in thousands of \$)*

*(Source: <https://intracen.org/resources/trade-statistics> ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities statistics)*



The results of the analysis shown in Table 6 indicate that the total value of the import of financial services to Serbia in 2019 increased (at the global level) by 145.69%. However, the analysis of imports in the first five countries in terms of import value shows increases, while only in Austria there is a decrease in imports (a decrease of 15.16%). In the given table, high values of increase in imports can be observed in France (112.37%), Belgium (69.45%) and Croatia (69.83%).

Exporting countries	Import in 2010	Average 2010-2014	Average 2015-2019	Import in 2019	Average 2010-2019	Percentage of increase 2019/2010
World	46,750	53,147	63,984	114,861	58,566	145.69
Europe	42,422	47,034	40,880	N,A,	44,727	11.48
European Union (EU 28)	41,096	44,906	41,062	48,295 (2018)	43,198	17.52
Austria	10,605	8,524	10,018	9,008 (2017)	9,084	-15.06
Belgium	N,A,	1,333	1,489	2,252 (2017)	1,400	69.45
China	N,A,	N,A,	1,118	1,126 (2017)	1,118	1.44
Croatia	1,326	1,327	1,489	2,252 (2017)	1,408	69.83
Cyprus	N,A,	1,307	N,A,	5,630 (2017)	1,307	3.19
France	2,651	3,977	4,094	7,882 (2017)	4,021	112.37

Table 6: Markets from which Serbia imports 7.2 Financial services in the period 2010-2019. (in thousands of \$)

(Source: <https://intracen.org/resources/trade-statistics> - ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities statistics)

The research findings shown in Table 7 indicate that the total value of exports of financial services from Serbia (at the global level) in 2019 has been increased by 53.31% and to EU countries by 104.12% compared to 2010.

Importing countries	Export in 2010	Average 2010-2014	Average 2015-2019	Export in 2019	Average 2010-2019	Percentage of increase 2019/2010
World	11,558	21,846	21,779	17,720	21,813	53.31
European Union (EU 28)	9,280	18,340	19,221	18,942 (2018)	18,731	104.12

Table 7: List of importing markets for a service (7.1) exported from Serbia - Financial services in the period 2010-2019. (in thousands of \$)

(Source: <https://intracen.org/resources/trade-statistics> - ITC, UNCTAD, WTO trade in services database based on Eurostat, International Monetary Fund, Organisation for Economic Co-operation and Development (OECD) and relevant national statistical authorities statistics)

The importance of the financial services sector for Serbia was determined on the basis of a quantitative indicator on the share of exports and imports of the financial services sector in the total export and import of services. The results indicate that in the analyzed period, the average share of export of financial services was less than 1%, while the average share of import was 1.77%. Although the role of the overall international exchange of services is far more significant, the aforementioned indicators speak of the insufficient development of the financial market and greater dependence on imports. The above data indicate that other service sectors developed faster and as such contributed more significantly to economic development.

In the Republic of Serbia the number of employees in the service sector has increased from 81 thousand in 2011 to 120 thousand in 2020. Although the increased number of employees in the service sector is accompanied by a more significant participation in the creation of GDP, the service sector (if the ICT services are excluded) is not so important for international trade. Thus, the earlier period was characterized by a far more significant participation of the service sector in the creation of GDP than it has participated in total international trade (export of services accounted for 26.8% of total export, and import of services 15.7% of total import of Serbia in the period 2006 - 2010). Based on the data of the RZS (Statistical Office of the Republic of Serbia, <https://www.stat.gov.rs/en-US>) in 2021, the most significant participation in the formation of the GDP was: the sector of processing industry and trade, the sector of real estate business, then agriculture, forestry and fishing, the construction sector, 6.0%. The structure of GDP according to aggregates of use is as follows: share of expenditures for individual consumption (64.9%), investment consumption (23.1%), state consumption (expenditure for individual consumption of the state sector 10.0% and for collective consumption of the state sector 6.9%), and net export (export of goods and services 54.5% and import of goods and services 62.3%). In the service sector, certain services have achieved real growth in added value (GVA). In 2021, real growth in gross added value (GVA) of 31.8% was achieved in the accommodation and catering services sector.

## 5. CONCLUSION

The role of each sector of the economy is measured by quantitative indicators and statistical data for certain categories of services. To the problem of accurately recording the value of exports or imports of certain goods, including financial services, due to carelessness in displaying the gross/net amount, some service transactions are not classified in the same way, i.e. they are not in accordance with the recommendations of the International Monetary Fund. At the global level, the export of financial services is in sixth place. The percentage of the increase in the exports in 2019 compared to 2010 is 46.82%, for the imports there is an increase of 56.6%, and the surplus also had an increasing trend (37.9%). Structure of export and import of Serbian services in the period from 2010-2019. indicates the unfavorable position of the financial services sector. A significant value of imports indicates a deficit. In the period 2010-2019, the export of financial services increased by 14.61%, and the import by 127.38%. However, both subsectors 7.1. and 7.2 record the deficit in the analyzed period in the Republic of Serbia. It must be remembered that the globalization of the world economy imposes a need on our country for greater inclusion in world flows and the exchange of goods, services, labor and capital. The way out of this bad situation that the Republic of Serbia has in the international exchange of financial services should be sought in the strengthening and development of economic sustainability and competitiveness. From the point of view of future development tendencies, it is important that the structure and quality of the Serbian financial services offer needs to be adapted to the demands of the world market. In developed European countries, which are also the main destinations of Serbian financial services exports, the competitive conditions are getting tougher, so survival and improvement of the position in such markets implies investing additional efforts to raise the level of competitiveness.

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## E-MARKETING AS DETERMINANT OF ECONOMIC GROWTH

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### ABSTRACT

*In this paper, we have examined the impact of e-marketing on economic growth in a sample of six WBC. The research was conducted using panel analysis. In addition to e-marketing, the impact of several other factors that are significant for economic growth was studied. The results indicate that e-marketing for country promotion, expressed through government expenditures for promotion, has no impact on economic growth, but other side the findings indicate that the specifics of the post-communist Western Balkan countries, in which the transition process has not yet been completed, effect on significance and direction of the impact of the other determinants of economic growth. This finding is very important primarily for social policymakers, in the sense that they are working to improve the conditions for a more favorable impact of these determinants. The primary task of social policymakers is to work on changing the structure of the economy, reducing import dependence, comparing the efficiency of public administration, and increasing the export of sophisticated products and services.*

**Keywords:** *E-marketing, determinants of competitiveness, panel data, Western Balkan countries*

### 1. INTRODUCTION

Marketing, which evolved from the productive concept to the selling and then the marketing concept to the social concept, found its applications on the internet within the framework of what has been termed as "Electronic Marketing", besides, this global network has opened wide prospects and great opportunities. Digital marketing provides enormous potential benefits. The question that arises is whether digital marketing can be used for the economic growth of the country. Economic growth represents the growth of the gross domestic product, as one of the basic indicators of economic activity over a long period of time in a national economy. It is an important driver of economic development and social well-being. Namely, it is generally known that very small changes in economic growth rates lead to very significant differences in the achieved standard of living. Barro and Sala-i- Martin (2004) argue that continuous and sustained economic growth is important for improving the welfare of individuals and that aggregate growth is probably the single most important factor affecting individual levels of income. Due to the importance of economic growth, attainment of high economic growth rates is a major national objective of any country (Sendi et al., 2021). However, on the other hand, as a consequence of a large number of factors and their interactions, economic growth may not lead to economic development and improvement of the well-being of citizens in a national economy. Having in mind the above, it is not surprising why economic growth is the subject of research by many authors. Numerous authors studied the influence of various economic factors, as well as their impacts on the economic growth process, as a result of which a substantial

number of economic growth models have been introduced along with the theory of economic growth. Despite that, the analysis of the literature indicates that it isn't possible to identify why some countries are rich while others are poor, and what determines the rate of growth. Madzar and Jovanovic (1991) claim it depends on available factors of production and the changes in the production function. Sendi et al., (2021) have a similar view, pointing out that it depends on the initial conditions. Schiller (2019), Hartmann (2020), and Schiller and Hellmann (2021) also add the quality of the macroeconomic environment in the broader sense of the term. The authors of these studies indicate that strong democracy and good governance often go hand in hand with sustainable economic growth in a country. Molua (2010) claims that a poor macroeconomic environment negatively affects demand, exchange rate, foreign funding and aggregate production. These inefficiencies result from ineffective government policies that stifle competition and limit economies of scale. Isaksson (2007) states that it depends on the quality of human resources. He argues that the way society and its production are organized can significantly explain the observed income divergence since the industrial revolution. It is certain that there is no universal theory of economic growth or model, but different factors of economic growth are relevant to different stages of economic development. The specifics of post-communist countries, which have gone through or have continued to go through a transition process over the last three decades, raise the question of whether these models are valid in their context. More precisely, the question arises as to whether the determinants of economic growth that have been identified as important for the further development of developed countries have the same significance for the post-communist countries of Southeast Europe, such as the Western Balkan countries. This issue is even more justified when we keep in mind that these countries have not fully implemented the transition process yet, i.e. privatization processes, and that large public companies are still owned by the state, which implies that in such conditions economic principles of business are not respected. Added to this is the fact that the conducted privatization process has affected the structural changes in the economy. From the point of capital-intensive activities, the process of transition has influenced the economy of these countries in order to be dominated by labour-intensive activities, i.e. extractive industries. The war conflicts during the 90's caused them to lag behind the rest of Europe technically and technologically. Although all the Western Balkan countries (WBC) had relatively developed industrial sectors prior to the transition process (with the exception of Albania), when it comes to technical and technological terms they did not lag far behind the middle-income European countries. However, it is a completely different situation today. Unsuccessful ownership transformations of companies that produced consumer goods have influenced these countries to become major importers of this type of goods in particular. The export structure of these countries is dominated by raw materials and products of low technical and technological quality. Unstable political and macroeconomic conditions affect these countries to lag behind other post-communist countries in both East and Southeast Europe in terms of attracting foreign direct investment (FDI). Due to frequently incorrect policies established for the purpose of encouraging foreign investment, such as employment subsidies, tax exemptions and other fees, an illusory picture of the positive effects of FDI has been created. Consequently, foreign investors frequently leave these countries after the end of the subsidy period. The findings of Koczan (2022) should be added to the above, according to which other factors than spending play a larger role in the Western Balkans than in Central and South-Eastern Europe: in particular, greater (perceived) income uncertainty and more pessimistic expectations about the future. Dissatisfaction with living standards is especially stark and persistent (Koczan, 2022). Taking into consideration that no studies have been conducted to examine the impact of key macroeconomics factors on economic growth in the sample of WBC using panel data analysis; hence the aim of this paper is to examine the impact of macroeconomics factors selected in the context of Krugman and Obstfeld's [2003] model on

economic growth in a sample consisting of the following WBC: Serbia, Bosnia and Herzegovina, Montenegro, North Macedonia, Croatia and Albania. These countries were chosen not only to keep in mind their shared legacy (with the exception of Albania), but also due to the fact that they are going through similar stages of transition and EU accession (with the exception of Croatia). Therefore, they form a more or less homogeneous group, whose specifics must be taken into account. The Krugman and Obstfeld's [2003] model was chosen while simultaneously keeping in mind that the specifics of the abovementioned countries may influence the determinants of economic growth, which are identified by this model as the key factors, meaning that they might exert the level of influence and significance rather different than expected. In addition, there is no clear indication of influence of certain determinants. Inflation represents a good example, for it has been identified as a factor exerting a positive influence in several studies, whereas other studies demonstrate inflation in terms of its exerting a negative influence. The paper is structured as follows. The first part of the paper is of introductory character. The second part of the paper gives an overview of the most significant empirical researches which deal with this issue and presents the results of previous research in this field. The third part of the paper provides a brief description of the analyzed data and the methodology used. In the next sector the results were presented, analyzed, and discussed. The finale part of the paper is of a concluding character, and it summarizes the findings and outlines the conclusions of this study.

## **2. LITERATURE REVIEW**

In the literature, there is an abundance of papers examining economic growth. In general, most of them studied the impact of different macroeconomic factors on the rate of economic growth, but there is not a paper which studies the impact of e-marketing on economic growth. As a result of that, today there are numerous models of economic growth. The characteristic of all these theories and models is that they have changed, ie developed in accordance with the current social systems, norms and value systems that prevailed in society at that time. In addition, they failed to identify all the factors, ie there is no one perfect model. One of the reasons for that can be found in the imperfection of the econometric apparatus. Namely, the appearance of endogeneity in certain variables in the models of economic growth influenced the omission of certain significant factors from the model. Among the first to point out this problem was Levine (1999). Another reason lies in the fact that there are a large number of unobserved factors that affect economic growth, which are specific only to certain countries. In support of this is the study conducted by Stawska (2021). Her findings point out that different EU countries react differently to economic shocks or other crises. Stawska and Reis (2021) have a similar view, such as Zielenkiewicz (2020). Ristanovic et al., (2018) using the Krugman and Obstfeld model conducted research in a sample of 61 countries and they concluded that real per capita GDP level, private consumption, investments, government expenditure, exports, and imports have a positive impact on economic growth in all selected counties, while those monetary determinants, such as inflation, interest rate and foreign direct investment have important the impact on economic growth only in developed countries. In order to capture these unobserved factors, the last 20 years dominate by papers examining the impact of different determinants of economic growth using panel analysis. So, Bassanini and Scarpetta [2001], on a sample of OECD countries, studied the determinants of economic growth and found that human and physical capital, economic openness, a healthy macroeconomic environment, R&D activity and the developed financial market have a positive effect on economic growth. Dewan and Hussein (2001) using a sample of 41 middle-income developing countries, studied the impact of labour forces, open trade policies, investment in physical and human capital and rate of inflation on economic growth. They found that all of these factors have a positive impact on the rate of economic growth. Similar factors have been studied by Fisher (1993).

His results are in line with Dewan and Hussein (2001). Starting from the idea of North (1990) and from the results of research by Acemoglu et al., (2014) and Thornton et al., (2011), Aparicio et al., (2016) studied the impact of entrepreneurship on economic development. More precisely, they studied the impact of formal and informal institutions on the development of entrepreneurship as determinants of economic development. The survey was conducted for the period from 2004 to 2014 on a sample of 43 Latin American countries. They concluded that informal institutions have a greater impact on the development of entrepreneurship, and thus on economic development, compared to formal institutions. Interestingly study conducted by Kilic (2015). He examined the impact of economic, social and political globalization on the rate of economic growth of 74 developing countries in the period from 1981 to the 2011 year. For purpose of the research, he used the Granger causality test and revealed that there is a positive relationship between economic, social and political globalization and rate of economic growth. Before him, similar researches were conducted by Polasek and Sellner (2011), who analyzed globalization's effects on economic growth in the sample of EU countries and Rao (2011). Even though there is still no consensus on a typical set of factors that affect economic growth, the analysis of existing research indicates that it is possible to identify several significant factors. Thus, Khan and Kumar (1997), Fowowe (2008), Abou-Ali, et al., (2009) and Anyanwu (2014) indicate that investment is the most fundamental determinant of economic growth. The importance of this factor has been proven both in the neo-classical and endogenous growth models. Exports and trade openness are also factors that have been identified in both neoclassical and endogenous growth models as key determinants of economic growth. The positive impact of these determinants is evidenced by the research of Balamoune and Mavrotas (2009), Arezki and Gylfason (2011), Assa (2012), Adams and Glück (2015). Chirwa and Odhiambo (2016), Kollmeyer and Peters (2019) There are several studies that find no conclusive evidence of the causal relationship between these factors and GDP growth. Ruiz-Nápoles. (2001) argues that even in cases where increasing exports has a positive effect on production expansion, such an effect may be limited and offset by increasing manufacturing imports displacing domestic production. Doubts about the importance of this factor were also raised by Awokuse (2003), while Fouad Abou-Stait (2005) warns that the results depend on the type of analysis used. Vamvakidis (2002) and Wang and Wong (2009) find a negative relationship between openness to international trade and economic growth. The impact of public expenditure has also been identified as an important variable affecting economic growth. Proponents of Keynesian teachings see public expenditure as a dependable function of income. On the other side there are substantial numbers of economists who believe that higher consumption can stimulate economic growth (Dobronogov and Iqbal, 2007). The findings of these studies vary from the fact that small and moderate public spending has a positive effect, to large economic growth (Barro (2003), Anaman (2004)). In the context of public expenditure, Doumbia (2019) specifically mentions the efficiency of government. He points out that the growth of well-being of the poorest population, as the ultimate goal of economic growth, is nonlinear and decreases with the level of corruption. Onofrei et al., (2020) in general see public finances as a key determinant of economic growth in the EU. Studying the inclusive growth of the Nordic countries, Balasubramanian et al., (2021) found that monetary and fiscal policy factors, trade openness, and strong public institutions are key drivers of economic growth. Inflation has also been identified as an important macroeconomic determinant affecting economic growth (Fischer (1992, 1993), Barro (2003), Albanesi (2007), Manamperi (2014), Sendi et al., (2021), Stawska, et al., (2021), Stawska and Jabłonska (2022)). The findings of these studies range from the fact that medium and high inflation hamper economic growth due to the adverse impact on the efficient distribution of resources by changing relative prices, until that inflation exhibits threshold effects on economic growth. Studying the determinants of inclusive growth on the EU country panel, Stawska and Jabłonska (2022) identified that the

real effective exchange rate is an important determinant of economic growth, such as consumption, interest rates and FDI. Similar studies were made by Barro and Lee (2000), Dollar and Kraay (2002), Anand et al., (2013), Alekhina and Ganelli (2020), Stawska, et al., (2019, 2021). However, despite the theoretically expected impact of these determinants on economic growth, the findings of these authors are contradictory. Although based on previous research, it is not possible to identify the optimal set of determinants, there is still a certain set of determinants that have been identified as significant, from the perspective of classical, neoclassical and new theories of growth (Antwi et al., 2013). However, the analysis of these researches indicates that determinants behave differently in different sets of variables and in different data panels. This obviously indicates that the specifics of different countries must be considered, as well as that the choice of determinants should be in accordance with proven theoretical models while respecting the conditions of validity of econometric models. Many growth economists choose many macroeconomic determinants as possible provided (Sala-i-Martin et al., 2004; Ciccone et al., 2010). This is because many studies support choosing a large number of determinants, arguing that the robustness of determinants is ensured by including more economic growth determinants (Doppelhofer et al., 2004; Bayraktar and Wang, 2006). However, numerous studies show that the determinants behave differently when pooled together which may confuse policymakers on country-specific economic policies. In addition, most of the mentioned papers suggest the possibility of an endogenous problem.

### **3. DATA AND METHODOLOGY**

The aim of the paper is to examine the relationship between the GDP and the major macroeconomic factors materials, according to the model of economic growth presented by Krugman and Obstfeld (2003), in which is included public expenditure for e-marketing, as a proxy for promoting countries via the Internet. Having in mind the above, the model was chosen because it includes all determinants that have been identified as important, from the perspective of classical, neoclassical and new theories of economic growth, but also the fact that it satisfies validity conditions of the econometric model. The model is an extension of the standard model of economic growth that studies the impact of GDP from the previous period, inflation, the effects of public consumption and the openness of the economy on the current rate of economic growth. Data are collected from the official sites World Bank and OECD, for the period between 2000 and 2020. For purpose of this study were used annual data. Description of explanatory variables are shown in Table 1.

*Table following on the next page*



Factor	Proxy	Description
Economic growth*	Gross Domestic Product	Gross Domestic Product (GDP) <i>per capita</i> (current in USD)
Public expenditure for e-marketing*	Expense (% of GDP)	Cash payments for operating activities of the government in providing goods and services for promoting country via the Internet
Consumption*	Final consumption expenditure as % GDP	The sum of household final consumption expenditure (private consumption) and general government final consumption expenditure (general government consumption).
Inflation**	Percentage change of the consumer price index	Reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services
Investment*	Gross capital formation	Consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories
Export*	Exports of goods and services (% of GDP)	Represent the value of all goods and other market services provided to the rest of the world.
Import*	Imports of goods and services (% of GDP)	Represent the value of all goods and other market services received from the rest of the world.
Foreign Direct Investment**	Foreign direct investment, net inflows (% of GDP)	The sum of equity capital, reinvestment of earnings, other long-term capital, and short-term capital as shown in the balance of payments
Real National Interest Rate**	Real interest rate (%)	It is the lending interest rate adjusted for inflation as measured by the GDP deflator.
Real Effective Exchange Rate**	Real effective exchange rate index (2010 = 100)	The nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.
All variables are transformed to fulfill appropriate econometric conditionals. The transformation was done using two different formulas. *In regression equation these variables are shown as $\ln(\text{variable}/100)$ , **In regression equation these variables are shown as $\ln(1+\text{variable}/100)$		

Table 1: Description of the variables  
 (Source: Author's)

The econometric model is expressed as the following, to notice that rate of GDP *per capita* (current in USD) is a dependent variable:

$$GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 PEX_t + \beta_3 CON_t + \beta_4 INR_t + \beta_5 INV_t + \beta_6 EXP_t + \beta_7 IMP_t + \beta_8 FDI_t + \beta_9 RIR_t + \beta_{10} REER_t + \varepsilon_t \quad [1]$$

Where GDP is the Gross Domestic Product;  $GDP_{t-1}$  is one past period GDP, PEX denotes public expenditure for e-marketing; CON is consumption, INR expresses rate of inflation; INV is investment; EXP is value of exports, IMP represents value of import; FDI is foreign direct investment, RIR represents real national interest rate, REER represents real effective exchange rate;  $\varepsilon$  is model error.

The rate of Gross Domestic Product (GDP) *per capita* (current in USD) is used as a proxy for economic growth. The lagged  $GDP_{t-1}$ , in order to see the impact of economic growth from the one lagged period on the current rate. The structure of the model itself determines the choice of estimator. The inclusion of a lagged dependent variable in the model causes a potential endogeneity problem because it is very likely that the lagged dependent variable is correlated with the model error, imposing a bias in the estimation.

According to Wooldridge (2003) and Radivojevic and Jovovic (2017) the OLS represents the most efficient estimator. However, it is true if and only if all the assumptions on which it is based are met. Otherwise, it will generate biased/unbiased and consistent/inconsistent estimates (some of these combinations), depending on which assumptions are not met. From the literature review on this subject, we observe that researchers have concluded that this topic might run the risk of endogeneity. A well-founded objection to numerous research that examined determinants of economic growth (which are emphasized in the paper) is that they did not take into account the endogeneity, while the choice of estimators such as Fixed-effects or Random Effects is justified only by applying formal tests for choosing the better estimator. The endogeneity was tested using the Hausman test. The results of the Hausman test are shown in Table 1A in the appendix. The choice of estimators is determined by the structure of the model, but also by the presence of endogeneity in the regressors. The endogeneity was tested using the Hausman test. The results of the Hausman test are shown in Table 1A in the appendix. The results of the endogeneity test show that the following variables are endogeneity variables: INR, EXP, IMP, FDI. The presence of endogeneity in those variables requires finding the appropriate IV (or excluding variables from the model) and it, also, affects the choice of estimator. The choice of adequate IV was made by the modified Okui (2005) procedure that pays attention to the effects of large heterogeneity. The procedure is based on higher-order asymptotic theory under double asymptotic. According to the procedure were chosen following instruments: squared INR, squared (lnEXP), lnIMP and squared FDI as instrumental variables. For the paper four estimators were used: the Two-Stage Least Squares (TSLS), IV-one-step difference GMM, Fixed-effects TSLS and the Panel Limited Information Maximum Likelihood (PLIML) approach that handles dynamic effects and endogenous variables with individual effects at the same time. These estimators were selected keeping in mind their asymptotic properties. According to Wooldridge [2003] and Radivojevic and Jovovic (2017) the TSLSs represent the most efficient IV estimators. However, it is true if and only if all the assumptions on which they are based are met. Otherwise, it will generate biased/unbiased and consistent/inconsistent estimates, depending on which assumptions are not met. The research was conducted by Anderson et al., (2009) shows that the TSLS estimator has a much larger variance for some values of the parameter than the LIML estimator. Also, Akashi and Kunitomo (2015) have been shown that the PLIML estimation method for the filtered data does give not only consistency but also has asymptotic normality and often attains the asymptotic efficiency bound when the order of orthogonal conditions is large or many instruments in some sense. On the other hand, according to Radivojevic et al., (2019), Cottrell and Lucchetti (2016), Chausse (2010) and Roodman (2009), the GMM gives consistent assessments even in conditions when the assumptions of others are not fulfilled. The GMM can be viewed as a generalization of many other methods, and as a result, it is less likely to be misspecified. The GMM generates correct standard errors and p-values, only under the condition that the defined moment conditions are valid. It is based on a simple idea that the estimations of parameters are done by solving a set of moment conditions. On the other hand, Hayakawa (2006) points out that the degree of heterogeneity affects both the asymptotic bias and the variance when using the GMM.

#### **4. EMPIRICAL ANALYSIS AND DISCUSSION OF RESULTS**

In table 2 are shown results of descriptive statistics of the data set. As can be seen from Table 2, GDP ranges from 2.869 to 8.962, which indicates very high disparity between minimum and maximum, but it is important in noting that all countries recorded economic growth in the observing period. The very high value of standard deviation of the GDP testifies to large fluctuation in the economic growth between countries. It is similar in the case of value of all commodities. The excess kurtosis is ranging from -1.363, in the case of the GDP to 50.326, in the case of the INR. This indicates that GDP has a significant platykurtosis.

The skewness of all the variables is different from zero, which indicates that they have asymmetric distribution. To identify a potential problem of multicollinearity in next step was conducted analysis of matrix correlation.

	<i>GDP</i>	<i>PEX</i>	<i>CON</i>	<i>INR</i>	<i>INV</i>	<i>EXP</i>	<i>IMP</i>	<i>FDI</i>
Mean	6.396	-1.108	-0.074	1.041	19.753	-1.067	-0.641	0.053
Standard Deviation	1.880	0.199	0.098	0.110	2.443	0.281	0.229	0.048
Excess Kurtosis	-1.363	-1.008	-0.559	50.326	-0.885	3.511	8.942	8.517
Skewness	-0.421	-0.555	0.066	6.777	-0.615	-1.002	-1.373	2.250
Minimum	2.869	-1.479	-0.256	0.984	14.660	-2.432	-1.987	0.000
Maximum	8.962	-0.827	0.150	1.950	23.333	-0.473	-0.075	0.317
No. obs.	120	68	116	120	119	120	120	120
	<i>RIR</i>	<i>RER</i>						
Mean	0.037	0.573						
Standard Deviation	0.056	0.266						
Excess Kurtosis	10.022	0.845						
Skewness	-2.180	-1.557						
Minimum	-0.297	0.000						
Maximum	0.145	0.877						
No. obs.	120	120						

*Table 2: Descriptive statistic of selected variables*  
 (Source: Author's)

The matrix correlation is presented in Table 3.

	<i>GDP</i>	<i>PEX</i>	<i>CON</i>	<i>INR</i>	<i>INV</i>	<i>EXP</i>	<i>IMP</i>	<i>FDI</i>	<i>RIR</i>	<i>RER</i>
GDP	1.000									
PEX	-0.594	1.000								
CON	-0.567	-0.082	1.000							
INR	0.117	0.055	0.086	1.000						
INV	0.971	-0.496	-0.556	0.148	1.000					
EXP	-0.056	0.231	-0.306	-0.466	-0.120	1.000				
IMP	-0.387	-0.266	0.301	-0.490	-0.416	0.579	1.000			
FDI	-0.071	-0.420	0.202	-0.113	-0.143	0.097	0.311	1.000		
RIR	0.006	-0.248	-0.131	-0.596	-0.035	0.078	0.133	0.184	1.000	1.00
RER	0.494	0.124	-0.285	0.131	0.632	-0.276	-0.373	-0.410	-0.016	

*Table 3: Matrix correlation*  
 (Source: Author's)

As can be seen from Table 3, there is no strong correlation (above 0.800) between variables. By using the one-step GMM estimator, the results are illustrated in Table 4.

Fixed-effects TSLS				TSLS		
Dependent variable: <b>GDP</b>				Dependent variable: <b>GDP</b>		
Endogenous: INR, EXP, IMP, FDI				Instrumented: INR, EXP, IMP, FDI		
Instruments: sqINR, sq(ln)EXP, lnIMP, sqFDI				Instruments: GDP <sub>(t-1)</sub> , PEX, CON, INV, sqINR, sq(lnEXP), lnIMP, sqFDI, RIR, RER		
Variable	coefficient	std. error	p-value	coefficient	std. error	p-value
const	6.374	0.872	0.000	-0.705	0.103	0.000
<b>GDP<sub>(t-1)</sub></b>	0.013	0.012	0.286	0.970	0.009	0.000
<b>PEX</b>	0.053	0.022	0.018	-0.008	0.007	0.223
<b>CON</b>	1.779	0.264	0.000	-0.190	0.061	0.003
<b>INR</b>	-0.112	0.122	0.359	0.522	0.049	0.000
<b>INV</b>	0.682	0.039	0.000	0.024	0.008	0.004
<b>EXP</b>	1.219	0.080	0.000	-0.116	0.023	0.000
<b>IMP</b>	-1.276	0.097	0.000	0.180	0.031	0.000
<b>FDI</b>	0.281	0.289	0.330	-0.345	0.085	0.000
<b>RIR</b>	0.212	0.228	0.353	-0.364	0.083	0.000
<b>RER</b>	-0.103	0.096	0.281	-0.083	0.023	0.001
R-squared: 0.97				R-squared: 0.99		
Wald chi-square(10) = 2871.58 (p-value 0.000)				Hausman test Chi-square(4) = 12.607 (p-value 0.013)		
Test for differing group intercepts F(5, 104) = 325.36 (p-value 0.000)						
<b>LIML</b>				<b>IV- one step GMM</b>		
Dependent variable: ROA				Dependent variable: ROA		
Instrumented: INR, EXP, IMP, FDI				Instrumented: INR, EXP, IMP, FDI		
Instruments: const, GDP <sub>(t-1)</sub> , PEX, CON, INV, sqINR, sq(lnEXP), lnIMP, sqFDI, RIR, RER				Instruments: const, GDP <sub>(t-1)</sub> , PEX, CON, INV, sqINR, sq(lnEXP), lnIMP, sqFDI, RIR, RER		
Variable	coefficient	std. error	p-value	coefficient	std. error	p-value
const	-7.139	0.532	0.000	-7.139	1.051	0.000
<b>GDP<sub>(t-1)</sub></b>	0.254	0.040	0.000	0.254	0.116	0.029
<b>PEX</b>	0.009	0.066	0.887	0.009	0.073	0.897
<b>CON</b>	0.401	0.622	0.519	0.401	0.543	0.460
<b>INR</b>	0.745	0.452	0.099	0.745	0.287	0.009
<b>INV</b>	0.599	0.034	0.000	0.599	0.094	0.000
<b>EXP</b>	0.466	0.223	0.036	0.466	0.155	0.003
<b>IMP</b>	-0.507	0.296	0.087	-0.507	0.198	0.010
<b>FDI</b>	0.161	0.958	0.867	0.161	0.832	0.847
<b>RIR</b>	1.827	0.749	0.015	1.827	0.677	0.007
<b>RER</b>	-0.915	0.233	0.000	-0.915	0.225	0.000
Equation is just identified				GMM criterion: 0.000		

Table 4: The one-step GMM method results  
 (Source: Author's)

As can be seen in Table 4, the model met all the requirements for all four estimators. It is evident that the estimators did not generate identical estimates. Based on the summary results of all four models, it is therefore possible to draw certain conclusions. Taking into consideration all the specifics and structural changes made during the transition process, which were elaborated in the introduction chapter of this paper, it could be noticed that consumption did not have a significant impact on economic growth. This is contrary to all expectations and economic theories according to which an increase in consumption – leads to an increase in production and thus to economic growth. Namely, this finding can be explained by the fact that these countries have become very dependent on imports. The structure of household consumption is dominated by imported consumer goods whereas the structure of domestic products is dominated by imported capital-intensive parts. Therefore, the increase in household consumption expenditure implies that it is certainly of no benefit to the country itself for the money keeps flowing out of the country. In addition, FDIs are usually focused on labour-intensive sectors, which usually manufacture semi-finished products used as inputs in the production of final products in the home countries of investors, as a result of which the effects of increased consumption of such products do not sufficiently contribute to economic growth. Bearing in mind that it is additionally combined with the fact that FDIs are supported by various subsidies, which are primarily economic in nature and often greater than the benefits of FDIs themselves, it is clear why our research findings are contrary to FDI-related economic theories. In this context, it is expected that FDIs will contribute to an increase in the level of economic activities, which will eventually lead to economic growth. On one hand, there are no significant inflows of FDIs into capital-intensive sectors and no significant technology transfer observed in these countries, but on the other hand, foreign investors in these countries transfer outdated technology, the use of which can potentially do more harm than good. Despite the dominant public perception of FDI in terms of its contributing exclusively to increasing social well-being and growth in the host country, this is not usually the case. The real effects of FDIs depend on the type, structure and intentions of foreign investors. A common example observed in these countries is related to foreign investors executing labour-intensive activities for the purpose of taking advantage of cheap labour, at the expense of capital-intensive activities that they relocate to their countries. In addition, the coefficient value of the IMP variable speaks in favour of their high dependence on import, consumer goods and sophisticated products. If these countries import raw materials for the purpose of producing sophisticated products, then the increase in imports could spill over into increased economic activity, and ultimately into economic growth. However, this result indicates the poor economic structure in these countries. Based on the abovementioned facts, it is possible to draw a clear conclusion that the structure of the country's economy determines the importance of certain determinants of economic growth. Taking all these facts into account, the high values of the coefficient should be interpreted, including those of the real exchange rate (RER) variable. Namely, national currency depreciation is expected to negatively affect economic entities in these countries. Such a high coefficient implies that the emphasis is not only on the import of raw materials as an input for further processing, but primarily on finished goods and products. As for the foreign trade balance, the indicator of how influencing this factor could be, is stronger than expected. Namely, an increase in the RER values implies that imports are becoming more expensive nowadays. Considering the domination of imports in comparison to exports, the positive effects of national currency depreciation on exports cannot compensate for the negative effects of depreciation on the value of imports. The surprising result is that interest rates have a positive impact on economic growth. Generally, higher interest rates can be expected to increase the value of domestic currency; thereby, investors will have a harder time deciding whether or not to fund a loan, and in this manner boost new investment activities. This result can be justified mainly by the fact that interest rates are considered to be very low, particularly the ones on large investments and mortgage loans.

Taking into account that the aforementioned activities are often supported by various government subsidies, the benefits of which are shown to exceed the rise in interest rates. The question arises to what extent the rise in interest rates will have a positive impact on economic growth. One theory suggests that rising interest rates are directly responsible for encouraging entrepreneurs to generate more efficient outcomes, despite the fact that it could be subject to debate and interpretation when it comes to the abovementioned countries, especially given the economic structure and dominance of large state-owned enterprises (SOEs) that are often guided by non-economic principles. Interestingly, government expenditure for e-marketing does not have a statistically significant impact on economic growth. This is contrary to all expectations and economic theories according to which an increase in promotion – leads to an increase in the visibility of the country's brand, which should reflect favourably on the country's reputation. The country's positive reputation, via increasing FDI, should contribute to economic growth. Another group of researchers point out that e-marketing leads to the differentiation of the country. According to this, higher expenditure on e-marketing should lead to an increase in the value of exported goods. An increase in the value of exports should contribute to economic growth. As regards the other determinants, the finding results are as expected. Namely, the economic growth from the previous period is expected to have a positive effect on the current economic growth, just like an increase in investment is expected to lead to an increase in activities, which has a positive effect on economic growth. It indicates the significance of rational investment decisions made by entrepreneurs, complete with the fact that positive effects of these investments are generated relatively quickly. This is a very important discovery, especially given the findings of Demaria and Rigot according to which insufficient capital investment has emerged as a major obstacle to economic growth (Demaria and Rigot, 2018). A similar situation applies to exports as well. However, the importance of exports should not be viewed only in the context of increasing consumption, but also in the context of achieving positive effects from economies of scale, exposure to competition and diffusion of knowledge. A somewhat surprising finding reveals the positive impact of inflation. Specifically, a positive and significant relationship was found between INR and gross domestic product (GDP). This finding comes as somewhat of a surprise and is not consistent with the prevailing literature (Knight et al., (1993), Fisher (1991), Ristanovic et al., (2018), etc.). The high inflation rate is expected to discourage businesses from investing in new projects since it correlates with a high degree of inherent risk. However, the result is in line with the views of Levine and Zervos (1993), who argue that: "very high inflation for very long periods may make people accustomed to inflation and hence lead them to develop various mechanisms for coping with inflation". However, inflation is not high in these countries. Given the findings of Edey (1994) and Bruno and Easterly (1998), which pointed out that in conditions of moderate or low inflation the correlation between inflation and economic growth is less clear, this finding is not so surprising. However, it is surprising when compared to the findings of Clark (1993), for this author did not find a statistically significant correlation between inflation and economic growth.

## 5. CONCLUSION

In this particular paper, we examined the impact of different macroeconomic factors on economic growth in a sample of six WBC. The multiple linear regression model was used in our study. For the purpose of estimating the model parameters, we used four different estimators. The survey covered the period 2000-2019. The research findings indicated that the significance of the indicators of certain economic growth determinants and their level of influence varied depending on their importance and direction in the developed countries. As regards the economic structure, which resulted from the failure of privatization, foreign trade imbalance, primarily on the import side, the dominance of consumer goods in the structure of consumption, as well as inefficient public expenditure management, it played a significant role

in influencing the determinants of economic growth, which is quite different from what was predicted by theory. In addition, poor policies to support the inflow of foreign direct investment (FDI) contribute to this fact. The findings clearly suggested that the governments of the aforementioned countries should focus on implementing changes in economic structures, i.e. on strengthening capital-intensive sectors of the economy, reducing import dependence, specifically consumer goods, changing its export structure and improving the efficiency of public administration. As regards the export structure, the share of sophisticated products should be increased, on the other hand, regarding the import structure, the share of raw materials intended for further processing should be increased. As for politics of popular incentives, they should be abandoned, particularly the ones related to attracting FDI. It indicated the necessity to create realistic conditions for attracting FDI, that would eventually lead to knowledge transfer, and would not result in attracting FDI aimed at the exploitation of cheap labour and raw materials.

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# APPENDIX

Variable	Choi meta-tests		Hausman test	
	Inverse chi-square(12)	p -value	Chi-square(1)	p -value
<b>GDP<sub>(t-1)</sub></b>	23.066	0.0272	2.008	0.156
<b>PEX</b>	-	-	0.459	0.497
<b>CON</b>	10.645	0.559	0.864	0.352
<b>INR</b>	209.641	0.000	47.001	0.000
<b>INV</b>	17.311	0.138	0.001	0.979
<b>EXP</b>	8.000	0.785	5.396	0.020
<b>IMP</b>	10.936	0.534	11.298	0.000
<b>FDI</b>	29.508	0.003	6.492	0.010
<b>RIR</b>	41.300	0.000	1.407	0.235
<b>RER</b>	-	0.000	2.229	0.135

Note: After first-order differentiations, all variables became stationary.

*Table 1A: Panel Unit Root Test and the Hausman Test*

*(Source: Author's)*

## CONSUMER ADOPTION OF INTERNET AS A MARKETING CHANNEL FOR TRADITIONAL FOOD PRODUCTS

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### ABSTRACT

*Manufacturers of traditional food products in Serbia frequently face the issues with placement of their products. Therefore, the aim of this research is to determine if usage of Internet more intensively as a marketing channel for promotion and distribution of traditional food products may improve the sales of the products in question. Furthermore, this survey will reveal if the consumers in Serbia adopt Internet as a marketing channel for informing and procurement of traditional food products, as well as what are the benefits and what may be the barriers of using Internet. Chosen survey instrument was a questionnaire. The questions were created in the Google questionnaire, and the respondents have been chosen by the "snowball" method, in the way that the questionnaire link was sent to email addresses of a huge number of responders, with the plea that the link is shared further. Number of filled questionnaires was 1124, out of which the sample was reduced to 893 respondents, after the first eliminatory question. The research was conducted on the territory of Serbia in April and May, 2022. The results have shown that the traditional food products in Serbia are still predominantly bought of the markets, and directly from the manufacturers, while Internet is still on the last place as a distribution channel. However, what is significant is the fact that the consumers are widely using Internet to get informed about the traditional food products and the manufacturers producing them, as well as about the location where these can be bought. Furthermore, the most important information which every website should contain in order to make further procurement of traditional food products have been identified. These results present useful guideline for both manufacturers and sellers of the traditional food products, which might serve as principles in making a certain website content.*

**Keywords:** *consumer behaviour, e-commerce, internet marketing, marketing channel, traditional food product*

### 1. INTRODUCTION

In 2006, the European Commission gave the following definition of tradition in relation to food. "Traditional implies proven use in the community market over a period of time, passed down from generation to generation; that time period can generally be described as one human generation, at least 25 years." (European Commission, 2006). After that, the definition of traditional food was developed through the work of the EuroFIR Network of Excellence. Their definition includes statements related to traditional ingredients, traditional composition, and traditional type of production and/or processing (Trichopoulou, Soukara, & Vasilopoulou, 2007). From the perspective of consumers, Guerrero et al. (2009) defined traditional food products as "products that are often consumed or associated with specific celebrations and/or seasons, usually passed down from one generation to another, made exactly in a specific way according to gastronomic heritage, with little or no processing/manipulation, are distinct and known for their sensory properties and are associated with a specific local area, region or country".

Therefore, traditional food products are most often handmade food products that are made in family farms, often from raw materials of organic origin in limited quantities. It is this uniqueness, specialness, lack of mass, rarity that raises their price, but also prevents mass production and marketing of these products. Therefore, producers of traditional food products are faced with a marketing problem, while consumers are often unable to find high-quality traditional food products. Standardization of quality, protection through designation of geographical origin and promotion are recognized as important elements in the growth of production and turnover of traditional food products. In recent times, marketing managers, using modern technologies, contribute to the expansion of the market of traditional food products and the creation of new brands. Internet presentations and social networks are recognized as tools for dynamizing market flows of traditional food products. In the future, the development of on-line sales can stimulate the production and trade of traditional food products, for which the building of trust between buyers and sellers is the key. The application of digital technologies for the purpose of contributing to the company's marketing activities serves to strengthen relations with customers and create additional product value (Elghannam, Escribano & Mesias, 2017). However, the development of e-commerce in the agri-food sector is at a very low level due to the fact that a small percentage of consumers buy food on-line, although the same research shows that a significant number of consumers used Internet to search for information or compare the prices of given products. According to research by Brkić et al. (2020) the traditional food products are not sufficiently present on Internet, as Internet is the basic means of information today. Their presentation on a unique, official, promotional and sales portal is what would significantly contribute to the popularization, visibility, availability of traditional food products, as well as improve the competitiveness of producers. Also, it was established that on the majority of websites of tourist organizations of cities/municipalities in Vojvodina (province in the Republic of Serbia), the gastronomic offer remains on the list of restaurants, while the list of producers of traditional food products is the exception rather than the rule, as well as that such an offer is available mainly (exclusively) in the Serbian language. However, the fact is that the event of Covid-19 and the wave of global lockdowns in many countries around the world, led to more intensive use of Internet not only for information but also for on-line shopping, in many countries of the world. For example, research by Barska and Wojciechowska-Solis (2020) indicates that the phenomenon of shopping virtualization has also been growing in strength lately, especially among food consumers. Although Polish food e-commerce is still relatively undeveloped, on-line food sales have been the fastest growing category of Internet sales. According to experts, by 2026, nearly 40% of all products globally will be sold on-line. Similar results were obtained in the research by Ćirić et al. (2020), which determined that the on-line purchase of organic food products in Serbia increased by 66.67% during the lockdown compared to the period before the outbreak of the Covid 19 pandemic. Therefore, the question of whether and to what extent after the Covid 19 pandemic, consumers of traditional food products in Serbia use Internet as a marketing channel for information and purchase of traditional food products, was the subject of research in this paper. What motivates them the most to use Internet, and what do they consider to be the biggest barriers to its use, when it comes to traditional food products.

## **2. RESEARCH METHOD**

Survey instrument was a questionnaire. The questionnaire was not standardized but was created on the basis of several important studies that were relevant to the mentioned topic: Barska and Wojciechowska-Solis (2020), Ćirić et al. (2020), Ćirić et al. (2021), Santos and Blanco (2011). The questions were created in Google Questionnaire. We selected the respondents using the "snowball" method, by sending the questionnaire link to the email addresses of a large number of respondents with a request to forward the link on.

This method made it possible to include as many respondents as possible in the research (Palys, 2008). The total number of completed questionnaires received was 1124, which is in accordance with the methodology of selecting respondents in the study of Barska and Wojciechowska-Solis (2020). Questionnaires where the answer to the first question whether you buy traditional food products was "no" were eliminated from the total number. In this way, the sample was reduced only to buyers of traditional food products in order to be able to carry out a more detailed research of the subject on the relevant sample. So the final sample was reduced to 893 respondents. The research was conducted in April and May 2022, among citizens living in Serbia. Data processing was performed using the SPSS program for statistical data processing. Descriptive statistics were used to analyze the phenomena in detail.

### 3. RESULTS AND DISCUSSION

In order to find out whether the sample we obtained using the snowball method is adequate for generalization to wider population of consumers in Serbia, we performed analysis of the demographic characteristics of examined sample. The obtained results are shown in Table 1.

	Question	Answer	Number	Percent %
1.	Gender	Male	369	41.32
		Female	524	58.67
2.	Years	Up to 25	253	28.33
		26-40	342	38.30
		41-60	225	25.19
		Over 61	73	8.18
3.	Qualification level	Elementary and High School	304	34.04
		College and University (diploma)	505	56.55
		Other (master, magister, doctor of science)	84	9.41
4.	Number of household members	1-2	168	18.81
		3-4	522	58.45
		5 and more	203	22.74

*Table 1: Demographic characteristics of the examined sample of consumers in Serbia  
 (Source: created by the authors based on a survey)*

Based on the results presented in the table, we see that there is approximately the same participation of men and women in the sample, with the fact that women are slightly more represented. There is also an even representation of members of generation z and generation y, while there are slightly more members of generation x and significantly fewer members of the baby boomers generation in the sample. So when interpreting the results, it must be taken into account that members of the baby boomers generation were less represented, which is not in accordance with the age structure of the population in Serbia, but is most likely a consequence of the fact that this age generation does not use Internet, so it was not able to be more affected by the snowball method we used in the survey. When we look at professional education, we notice that in the sample there is approximately the same participation of respondents with basic and secondary vocational education and respondents with higher and higher vocational education, while respondents with the title of Master, Master of Science and Doctor of Science are less represented, which is a justified sample, considering the lower participation of this categories of respondents in the overall structure of the population.

When it comes to the number of household members, we see that the sample includes one and two-member households as well as five-member and multi-member households. While three and four-member households dominate. Based on the demographic structure of the examined sample, we can conclude that the sample is suitable for the analysis of consumers of traditional food products in Serbia. In order to determine to what extent and what type of traditional food products the respondents consume, we asked them a question so that for each group of traditional food products they had the task of evaluating the extent to which they use them in their own consumption from very often marked with a score of 5 to very rarely marked grade of 1. We presented the obtained results in Table 2.

1.	Dairy products	3.6
2.	Honey	3.4
3.	Meat products	3.2
4.	Pasta, mill and bakery products	3.1
5.	Juices and drinks	2.7
6.	Fruit and vegetable products	1.8
7.	Vegetable oils	1.4
8.	Confectionery products	1.4
9.	Spices and tea	1.2

*Table 2: Representation of certain groups of traditional food products in own consumption  
 (Source: created by the authors based on a survey)*

Based on the obtained results, we can conclude that traditional food products are not represented very often in the respondents' consumption, but that there is a moderate representation of dairy products, honey, meat products, pasta, mill and bakery products and juices and beverages, while all other groups of traditional food products are represented very rarely in the respondents' consumption. This is in accordance with the research by Ćirić et al. (2020) which was carried out on the territory of Vojvodina, which is a province in Serbia. The reasons for the lower consumption of traditional food products made of fruits and vegetables, vegetable oils, confectionery, spices and teas lie in the strong competition of products produced in a standard way, as well as insufficiently developed brand and recognition on the market. In order to understand the tendency of consumers to consume traditional food products, we tried to find out about the basic motives for the consumption of traditional food products among consumers in Serbia. Therefore, we asked the question so that the respondents had the task of evaluating the importance of the stated motives for the consumption of traditional products. A score of 1 should indicate a completely insignificant motive, and a score of 5 a completely significant motive.

1	Healthier than conventional ones	4.7
2	Taste better than conventional ones	4.5
3	Guarantee top quality	3.9
4	Domestic (produced in my country)	3.5
5	Confidence since I know the manufacturer	3.2
6	Better look than conventional ones	3.1
7	Better brand than the conventional	2.3
8	Better packing than the conventional	1.5

*Table 3: Motives of purchase of traditional food products  
 (Source: created by the authors based on a survey)*



Based on the obtained results, we can see that health care and the taste of traditional food products are what motivates respondents the most to buy them. This is in accordance with Popović et al. (2011) who state that, among other traditional foods, Serbian cheese and 'kajmak' are consumed on a daily basis, whereby cow's milk cheese and 'kajmak' are generally perceived as healthy food considering their composition of proteins, minerals and vitamins. This motive for healthy food and the perception of traditional milk products as healthy can also provide an explanation for the result we obtained that of the traditional food products, milk products are bought the most. Motives such as the perception of high quality as well as the domestic origin of traditional food products also received a high rating. However, what is significant for the subject of our research is that the motive that indicates trust between consumers and producers is also important because it was rated with an average score of 3.2, which indicates that on-line shopping can be a problem if trust is not built with the producer. What is also noticeable is that the brand and packaging do not motivate respondents to buy traditional food products, which is in line with earlier research by Ćirić et al (2020) and Prodanović et al (2021), which indicate an insufficiently developed brand of traditional food products and on the need to strengthen it to achieve greater product competitiveness. In order to determine the extent to which Internet is represented as a sales channel for traditional food products, we asked respondents where they buy traditional food products, with the option of rounding off several answers.

1	Market	60.70%
2	Directly from the producer	48.10%
3	Supermarkets	35.60%
4	Specialized stores	23.20%
5	Internet	15.10%

*Table 4: Place of purchase of traditional food products  
 (Source: created by the authors based on a survey)*

Based on the obtained data, we can conclude that the market and direct sales of traditional food products by producers are the dominant channels through which customers buy traditional food products. The percentage of customers who buy this type of product in supermarkets is also significant, and in this sense there is an opportunity to expand the offer of traditional food products through their introduction into the supermarket offer. But what seems quite surprising at the moment is that Internet is still poorly represented as a channel for buying traditional food products. In order to determine the precise purpose for which Internet is used when it comes to buying traditional food products, a series of positions were defined with which consumers could fully agree by giving a rating of 5 or completely disagree by giving a rating of 1.

1.	I use Internet to find the location of a point of sale where a traditional food product can be purchased	4.1
2.	I use Internet for more detailed information about a traditional food product that interests me	3.8
3.	I use Internet for information about a particular producer of a traditional food product	3.4
4.	I use Internet to find recipes with traditional food products	2.7
5.	I use Internet to reach a phone number that I can call for more detailed information about a traditional food product	2.3
6.	I use Internet to order a traditional food product on-line	1.8

*Table 5: The purpose of Internet in the process of information and purchase of traditional food products  
 (Source: created by the authors based on a survey)*

The obtained results indicate that Internet is mostly used to find information about the point of sale where a certain product can be purchased. This fact speaks in favor of the fact that those producers who do not buy directly from the producer on his farm or in the market, but want to buy the product in a store, use Internet to determine if and where they can find a certain product. It is also observed that Internet is used to a greater extent to find information about the product and the manufacturer of traditional food products, which is in line with research (Elghannam, Escribano & Mesias, 2017). While the Internet is still rated very low as a channel for on-line shopping of traditional food products. Therefore, for the understanding of the phenomenon, the answer of the respondents about which barriers are the most significant for the respondents, when it comes to the on-line purchase of traditional food products, which is shown in Table 6, is very important.

1.	Many traditional food products cannot be found on Internet	4.5
2.	Delivery charges are high	4.3
3.	Time of delivery is long	4.1
4.	The product offering is not consistent and the websites are not updated	3.8
5.	The product cannot be touched or smelled	3.8
6.	Trust in online retailer is important issue	3.7
7.	Trust in health-safe transportation is important issue	3.6
8.	Design and aesthetic of online shopping websites are important issues	3.2
9.	Safety of personal data is important issue	2.4

*Table 6: Barriers to on-line shopping of traditional food products by Internet  
 (Source: created by the authors based on a survey)*

The obtained results indicate that the biggest problem is that many traditional food products cannot be found on Internet, which is in accordance with the research of Brkić et al. (2020). Also, delivery costs and delivery time are also factors that limit the process of online shopping of traditional food products, as well as the fact that not all traditional products are always available, as well as that websites are not updated and do not provide correct information, which is in accordance with the research of Ćirić et al. (2021). The obtained result is very important for producers of traditional food products because it indicates the need for a different and more efficient organization of the chain of distribution and delivery of traditional food products. Also due to the inability to see the products, trust in the manufacturer and seller of traditional food products is very important for the respondents. Design and aesthetic of online shopping websites is of moderate importance to them, but it also turns out to be a possible barrier when websites are not created to be user friendly. Concern for personal data is not something that restricts users from online shopping for organic food products. Although there is a whole series of barriers to the purchase of traditional food products, they are of such a nature that they can be removed if consumers believe that on-line shopping can bring them certain benefits, therefore we asked the question to determine whether consumers of certain benefits that are common for on-line shopping also highly value when it comes to on-line shopping of traditional food products. We presented the obtained results in Table 7.

1.	There is less physical effort because the products are delivered to home address	4.9
2.	There is time saving in such shopping	4.8
3.	There is a possibility of easier price comparison	3.5
4.	Faster product search	3.2
5.	Reviews and recommendations of other consumers	3.0

*Table 7: Benefits of on-line shopping of traditional food products by Internet  
 (Source: created by the authors based on a survey)*

The obtained results support the fact that all the benefits associated with the on-line purchase of products are equally important in the on-line purchase of traditional food products. Whereby, the possibility to reduce the physical effort involved in carrying the purchased food, as well as saving time when not going to the manufacturer, market or supermarket to do the shopping, stand out as the most significant. These are exactly the benefits on which a marketing strategy should be built in promoting on-line purchase of traditional food products. What can be observed is that the respondents do not give the highest marks to the quick search for products and the possibility of easier price comparison, what is in line with research by Brkić et al. (2020), which indicates a weak presence of traditional food products on the Internet. That goes in favor of the fact that manufacturers of traditional products should invest in the creation and optimization of their own websites, as well as into paid advertising on Internet in order to get closer to potential consumers. Also, it was important to determine which information should be on the website of food product manufacturers, and which is the most important for consumers. A number of offered answers were given, which the consumers were supposed to rate in order of significance with a score of 5 being completely significant to a score of 1 being completely insignificant.

1.	Product price	5
2.	Product images	5
3.	Delivery method	5
4.	Delivery price	5
5.	Assortment	4.9
6.	Package size	4.8
7.	Location of the sales facility	4.8
8.	Impressions of other customers	4.8
9.	Certificates	4.6
10.	Awards and recognitions of the product	4.5
11.	Mobile phone number	4.1
12.	E-mail address	3.9
13.	Pictures of production facilities and equipment	3.5
14.	Photographs of the manufacturer	2.1
15.	Local fix telephone number	1.8

*Table 8: Information on the website of importance for buyers of traditional food products  
 (Source: created by the authors based on a survey)*

Based on the obtained results shown in the table 8, it can be seen that the most important thing on the website is to clearly and visibly display the price of the product, images of the product, method and price of delivery. These are factors that all respondents agree are completely significant for their purchase decision.

This is in accordance with the research of Novak et al. (2003) who argues that product assortments in color, design or price on the shopping websites can increase web browsing gathering information or comparison shopping. Sreeram et al. (2017) have revealed that a large proportion of consumers consider delivery charges a major deterrent of on-line grocery shopping. A lot of Indian shoppers use on-line shopping carts to compare prices of similar products with no intention to purchase (45%). They also stop short of clicking 'purchase' as they are put off from higher than expected shipping costs (54%), or face issues with out-of-stock items (42%) (Laheri, Vohra & Dangi, 2019). Therefore, it is very important to take care of the delivery price. Also, other researches speak in favor of the importance of the assortment, impressions of other customers and quality marks, as we have also determined. Product assortment in the website encourage consumer buying behavior, which results in gathering more information about the product and finally impulsive buying behaviour (Park and Kim, 2008; Park et al., 2012). Social communities and forums influence consumer attitude in both cognitive and affective extents. Consumers do participate in online social groups, by observing others' knowledge and experience and through interaction ultimately can affect their attitude and beliefs. Social recommendations, rating and reviews are very important (Tariq et al. 2019). Strengthening the display of food quality signs and labels and improving the authenticity, richness and legibility of food quality information can help consumers form better perceptions of quality and risk (Liu and Zheng, 2019).

#### 4. CONCLUSION

Based on the research results, we can conclude that the consumption of traditional food products in the diet of the population of Serbia is moderate. Purchases are still mostly made directly from producers on farms or on the market. The Internet is rarely used for on-line shopping. The biggest use of the Internet is for information about the location of the point of sale where traditional food products can be bought, as well as for obtaining more detailed information about products and producers. The reasons for smaller purchases compared to other sales channels can be found in the fact that the traditional food products that are bought the most are primarily milk, meat and honey products, and for them distribution is complicated because the usual courier services cannot be used for delivery, considering that a special way of transporting them is needed. This conclusion is also confirmed by the statement which respondents state that some traditional food products cannot be found on Internet, that delivery costs and delivery time are high. Some respondents cited the inability to touch and smell the product as a barrier to on-line shopping. Also, it is stated as a problem, that the product offer is not always consistent, that is, it happens that the product is displayed on the website but is not in stock. Trust in the manufacturer and health-safe transport is also a significant barrier. However, what the majority of respondents positively assess, even if not everyone buys on-line, is that on-line shopping enables less physical effort, reduces shopping time and enables easier price comparison. Therefore, the recommendation for manufacturers of traditional food products is to organize and provide suitable vehicles for the transport of traditional food products through association, so that they can ensure safe, fast and cheaper delivery, because this is the main barrier to buying these products on-line. Also, it is important that each manufacturer, separately or through an association, has its own website, which must contain product images, prices, delivery method and price, and always updated assortment, package sizes, location of the sales facility, impressions of other customers, certificates, awards, mobile phone number and e-mail. These are information that respondents rated as very important, so it must be mandatory on the website. In addition, it is not enough to just have a website, it is important that it has good SEO optimization and that it invests in advertising on the internet so that potential customers appear among the first when they search on Google.

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## EUROPE THROUGH THE PRISM OF ECONOMIC FREEDOM

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### **ABSTRACT**

*Economic freedom represents the freedom of economic subjects to work, produce, spend, save, invest in the desired way, while their security and protection is provided by the state, without unnecessarily interfering with the aforementioned fundamental rights to work and acquire property. The Heritage Foundation has been quantifying economic freedom for many years by constructing the Index of Economic Freedom. The activities of the governments of countries around the world are monitored and evaluated through an index in 12 areas that are proved to contribute to economic growth and development, but also in other areas such as education, health, environment, social progress and democratic governance. The paper analyzes the state of economic freedom in the world in the period from 1995 to 2016 with a special focus on Europe and the Republic of Serbia. It is concluded that Europe still needs to improve economic freedom, especially in the area of fiscal freedom and public spending.*

**Keywords:** *Economic growth, Economic freedom, Europe, Index of economic freedom*

### **1. INTRODUCTION**

The Heritage foundation in the cooperation with the Wall Street Journal, every year announces the report about the state of the economic freedom in the world. Index of Economic Freedom of Heritage Foundation emphasizes a wide range of variables from the domain of economic politics, which influence is known for economic efficiency: inflation rate, taxes, public spending, public firms, government investments, custom rates, trade barriers, prices control, disorders of labor market, capital and other. Economic Index of freedom represents a statement about institutional measures and total economic politics of some country, which Heckelman (2000) points out as the biggest advantage of Heritage index, where the creators of economic politics should be considering their forecasts and recommendations. Economic freedom in index is represented as an unweighted average of 10 sub-indexes: Property rights, Freedom from corruption (which form the pillar of the Rule of Law), Fiscal freedom, Public spending (Government restrictions pillar), Business freedom, Labor freedom, Monetary freedom (Efficiency of regulation), Freedom of trade, Freedom of investment and Financial freedom (Market openness). From the 2017, Heritage Foundation is been doing smaller changes where now Index consists of 12 elements (every pillar counts three elements). Achieved level of freedom is measured on the scale from 0 to 100 where economies are reflected with epithets "repressed" economy (below 50 points), "mostly unfree" (50-59.9), "moderately free" (60 - 69.9), mostly free economy (70 -79.9) and free economy (80 - 100). Looking at the influence of economic freedom on different economic indicators, some authors analyze those relations on exact geographic – social – politic – economic grouping countries. Low number of studies pay attention to examine influence of economic freedom on different indicators of economic growth in the European region as a whole, but also in the focus were exact groups inside of that region: countries of European Union (Rajasalu, 2003, Hall, Lawson and Wogsland, 2011), countries of East and West Europe (Altay & Çelebioğlu, 2011) European transitions countries (Vukotić & Baćović, 2006, Pääkkönen, 2009, Próchniak, 2011, Piątek, Szarzec & Pilc, 2013,

Kovačević & Borović, 2014, Bayar, 2015). Some authors had in focus region of South America (Bengoa & Sanchez-Robles, 2003 and Alexandrakis & Livanis, 2013) with the goal to examine if the politics of liberalization is going to reach economic growth of North America, which was on the other side subject of research. Karabegovic, Samida, Schlegel & McMahon (2003), Compton, Giedeman & Hoover (2011) and Bennett (2016). African countries, from the aspect of the level of economic freedom and consequently its influence, they were a subject of research N'Zue (2010), Ossono (2012) and Gorchach & Le Roux (2013). Asia is a continent of a large economic and social differences, from highly developed Japan, Singapore and South Korea, to North Korea, Afghanistan, Nepal and Myanmar, with the poorest and also expressively repressive economies, about this part of the world especially dealt authors Paldam (2003), Sarvananthan (2004), Nasir & Hassan (2011), Tiwari (2011) and Khan (2012). In the next sections of article is made an analysis of economic freedom in the world, according to the Index of Economic Freedom of Heritage Foundation, with the special review on European region and inside groups. Also, analysis is executed on the Republic of Serbia through the prism of economic freedom.

## 2. ECONOMIC FREEDOM IN THE WORLD

The creators of the Index of Economic Freedom from year to year have been increasing the number of observing countries, starting from 101 in 1995, where 27 years later that number has increased to 177 countries according to economic freedom's criteria. Although there is insight of 184 countries, the index is not found for 7 countries in 2022, because those countries are located in war territory and dataset could not be relevant for this approach. On the top of the world's list the largest number of countries that have been there are Singapore, New Zealand, Switzerland, United Kingdom, USA, Ireland and Island with changing positions over time. North Korea (always last), Cuba, Iraq, Angola, Libya, Democratic Republic of Congo, Guinea, Bisao, Laos, Syria, Belarus, Zimbabwe are countries that are always at the bottom of the list. Overview of the condition with countries with the most freedom and with the least freedom are visible in the Table 1.

Most free		Most unfree	
1.	Singapore	1.	North Korea
2.	Switzerland	2.	Venezuela
3.	Ireland	3.	Cuba
4.	New Zealand	4.	Sudan
5.	Luxemburg	5.	Zimbabwe
6.	Taiwan	6.	Burundi
7.	Estonia	7.	Eritrea
8.	Netherlands	8.	Iran
9.	Finland	9.	Bolivia
10.	Denmark	10.	Central African Republic

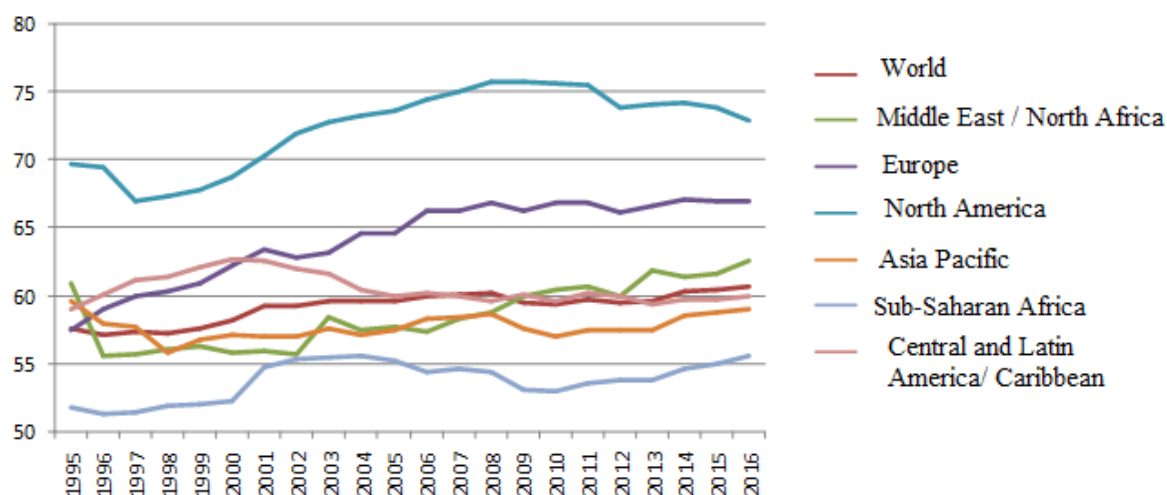
*Table 1: Review the most and the least free economies according to the world's report about economic freedom from 2022*

*(Source: The author, according to Miller, Kim, Roberts and Tyrrell (2022))*

In the moment of issuing report about the state of the economic freedom in 2020 and 2021, the world has been in the highest point of economic freedom from the moment of measuring the index, with the world's average of 61.6, while according to the report of 2022 the average was drop with the whole 1.6 points, which is the highest drop ever. It could be said that the world is "moderate free" according to the economic freedom. Number of mainly free countries in this moment are 54, while mainly non-free countries are 57 and 32 are still repressive with the



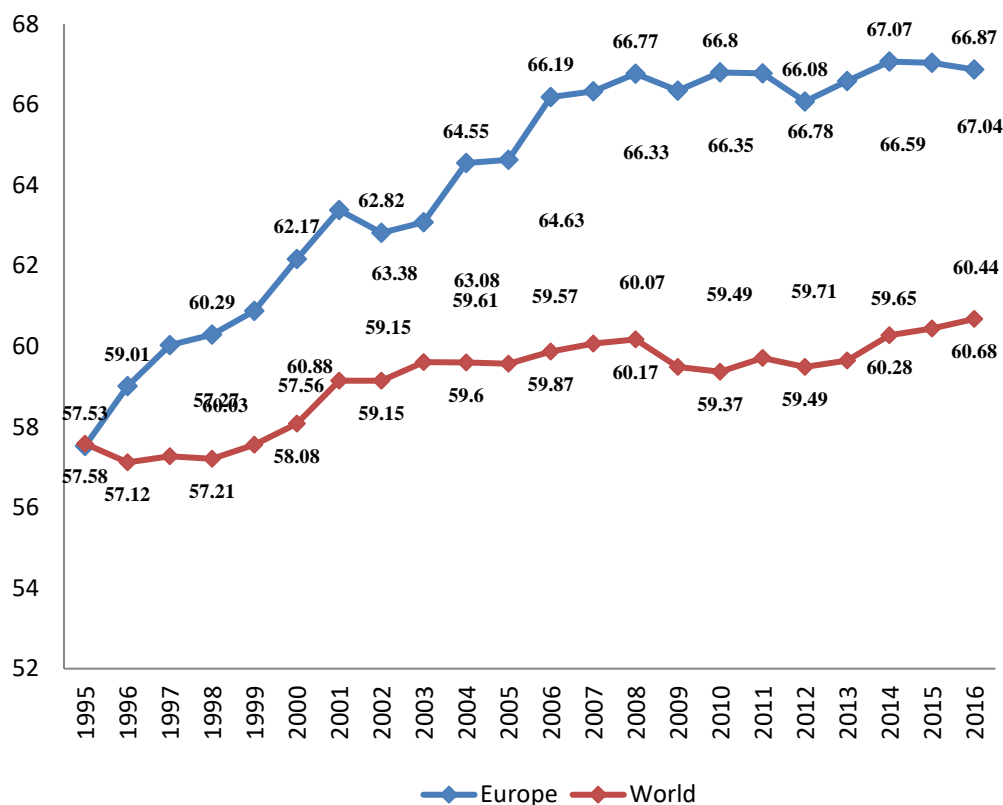
average of less than 50 points. The 5 most free countries with the average more than 80 points are Singapore (84.4), Switzerland (84.2), Ireland (82), New Zealand (80.6) and Luxemburg (80.6). Next to the Luxemburg are for the first time as the most economic free countries classified Taiwan and Estonia. Twenty-seven countries are considered as “mostly free” with the scoring between 70 and 79.9 points. Also, “moderate free” countries with scores from 60 to 69.9 points counts 54 while a total of 88 countries which is half of the 177 countries graded in 2022 gives at least some of the moderate freedom where individuals benefits from settled institutional environment and private enterprises benefit to pursue greater economic prosperity and development. One of the biggest boost for giving economic freedom comes from investments freedom. On the very last place comes again North Korea with the index of 3.0. The Heritage Foundation divides world in the six parts, according to geographical, cultural, historical and geopolitical characteristics. The biggest region of Sub-Saharan Africa which counts 46 countries is also the least free, with eight repressive and twenty-eight mostly unfree countries. Opposite, the smallest region – North America consists of three countries: high ranking of USA and Canada which are mostly free economies and Mexico which are mostly unfree, and that gives this region point to be one of the most economically free and far above the average. For Europe is characteristic usually free atmosphere in the economic sense, although there is a space for improving positions and progressing in this region. Specificity of Asian and Pacific regions is related to extremity of its countries. This region consists of four (or five) free economies and a significant number of mostly unfree where eight are repressive. One more important characteristic in this region is that it is the most populous region in the world. South, Central and Caribes consist of 29 countries, which are mostly moderate free, while the second largest region, the Middle East and North Africa, is composed of 14 countries with mostly moderate degrees of freedom. The furthest from the world average, at the highest level of economic freedom, is the region of North America, followed by Europe, while the twenty-year average of the worst-ranked region of Sub-Saharan Africa is just above the repressive limit.



*Graph 1: Trend of movement of economic freedom*  
 (Source: Authors, according to the data took over from [www.heritage.org](http://www.heritage.org))

### 3. ECONOMIC FREEDOM IN EUROPE

The growth trend that is visible in the European region comes from large political – economic changes at the beginning of 1990s where most of the socialistic countries (East Europe) made a transition from central based economy to capitalistic system, which is liberal and market oriented (graph 2).



*Graph 2: Index of Economic Freedom – growth trend world and European average  
 (Source: Authors, adjusted according to data taken from [www.heritage.org](http://www.heritage.org))*

Property rights are one of many criteriums on the world's level which shows constant drop from the beginning of measuring index, reaching the lowest value in 2015 of 42 points. Drop in protection rights is also a characteristic of European region, where this category in 2016 shows the lowest point of 59.8. Established property rights are feature of ordered countries characterized by an independent and efficient judiciary and the rule of law. Traditionally stable countries in Europe are characterized by a strong legal and institutional framework, where court proceedings are fair and transparent, and great importance is given to the protection of intellectual property. The opposite is the situation in "emerging countries" where the sluggishness of the judicial system, riddled with corruption, prone to political influence, collapses property rights and affects the reduction of the European average of this indicator of economic freedom. Analyze of subindex Freedom from corruption, in developed countries of Western Europe is seen constant and high level of index, but the influence of fight of ex socialistic countries against corruption have brought to the trend of indicator growth, where corruption was the heart of the bureaucratic system. Many countries are aware that fight against corruption represents one of the most important conditions to become a part of the European Union, which brought to improvement and growth of freedom from corruption. Better ranking region according to this measuring is just North America, but other regions are on the lower level on the scale which represents that the world's order oscillates around forty repressive point and sends a signal about the world's most political – economic problem. Corruption, cronyism, nepotism, political safety, illegal donations are all of the features of every government in the world on all political levels, in the more or less measure. Corruption is spread across all public sectors including police, judiciary, higher education and health care, with big consequences for civil society and for the whole humanity. Important part of the European countries, especially Scandinavian, characterize extremely high tax burden, while the relative tax pressure is low

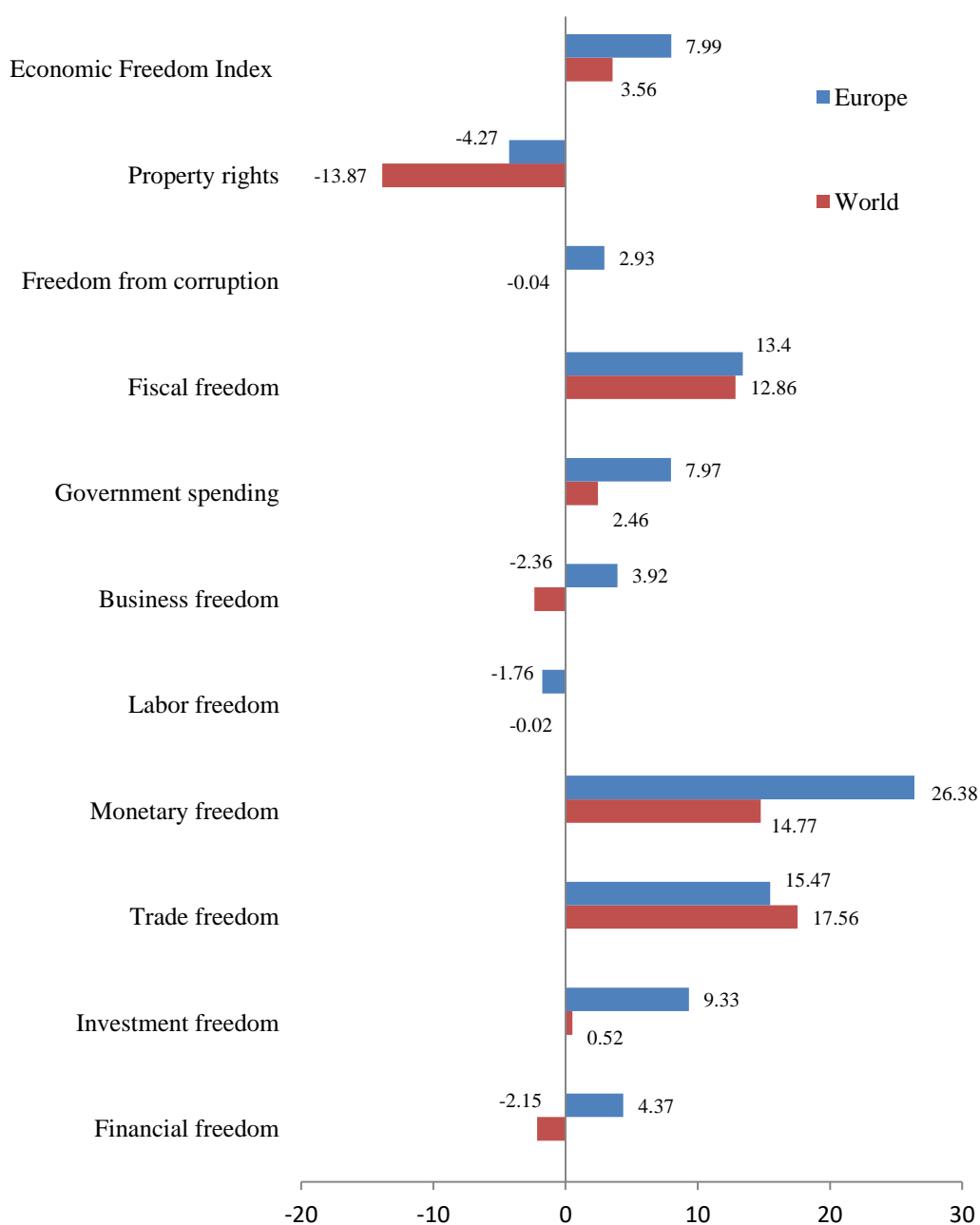
because of higher economic standard and rich social programs. Fiscal freedom becomes higher with lowering tax burden. Above the world's average are United Kingdom, Germany, France and Spain. Undeveloped countries with lower tax burden push average up with the purpose to not additionally burden their population and boost economy. Low tax rates are characteristic of Baltic countries and countries of Caucasus's region and trend of lowering is visible in Belarus, Czech Republic, Slovakia, Romania and Turkey. The lowest tax rates in 2022 are seen in Bulgaria (10%) and Cyprus (12.5%), Montenegro (15%), North Macedonia (18%) and Serbia (20%). The European continent is characterized by large government expenditures. The entire region is about twenty index points below the world average over the past twenty years (Europe's average is 44.4, while the world average is 66.7) and is the lowest positioned of all regions. From the Nordic model, France, Germany all the way to Italy, Portugal, and finally Greece, there are different causes, consequences and goals but the same tool: large government spending. Therefore, the reduction of government spending and the arrangement of public finances is therefore set as an imperative to increase the economic freedom of this part of the world. Business freedom in Europe is at a high level due to the long tradition of free entrepreneurship in Western and developed European countries. In the process of transition, the former Soviet states as well as the countries of the Balkans moved towards the liberalization of regulations in that area, which would have significant effects on the economies of those countries. Labor freedom is measured from 2005 and oscillation value of subindex is not dramatical on the world level (from 59.7 to 62.4), while on the European level (from 59.5 to 62.8). The report from 2015 tells that freedom of work records value of 1.6 points on the world level, which reflects stagnation in the regulation of employment without any progress in the flexibility of labor market. The highest rank country according to freedom of work is USA, and in Europe is Denmark, where relative conditions of employment and dismissal of workers maintains labor market efficient. Georgia is recognized as country that gives flexible working hours, United Kingdom gives less severance pay, low cost of employment for Estonia, while other countries stagnate according to the indicator of economic freedom. Price stability and their market formation are the main points of subindex Monetary freedom. A big growth of this subindex between 1995 and 2001 in Europe is related with making a monetary balance for countries in transition. Most countries hold inflation on the acceptable rate, while in Belarus, Ukraine, Turkey and Russia are on unacceptable level (18.1%, 12.1%, 8.9%, 7.8% retrospectively) observed in the last year of included period. In the most countries there is still distortion of prices because of big subventions to non-efficient government's firms. The biggest subventions are in areas of energetic, agriculture, food and transport, and they are not characteristic just for smaller developed countries. According to the criterium of Trade freedom, European region achieves bigger average from world's, especially because of custom union (unique trade region inside of the EU). Custom's rate for EU members is 1%; low custom's rate also got Georgia (0.7%), while Switzerland and Liechtenstein do not have tariff rates. Russia (5.5%) and Serbia (6.5%) still have the highest tariff rates in Europe. Growth of Investment freedom characterize European countries, where a good example gives countries from the ex-Socialistic Republic of Yugoslavia and Caucasus's countries (Georgia and Armenia). Countries Russia, Belarus, Ukraine and Moldavia drops to this criteria, while Baltics and other developed countries constantly free for investments. Denmark represents one of the most opened countries to foreign investments, where they perform transparently and efficient. Italy and France are specific for this topic where their governments invest directly to the strategic companies. In the most countries domestic and foreign investors have same legal treatment, while the foreign property on resource different regulated. Weak legal system could represent barrier for some countries to make progress. Stagnation is visible on the world and European's level in terms of Financial freedom since the period after world economic crisis in 2008.

In the most countries the financial sector is competitive and mostly stable, giving the full assortment of service. In the strong countries such as Germany, France, Ireland or Norway, banks are in government's property. In Balkan region, privatization of banks is mostly done, but low quality of credits and non-developed capital market is burdening these countries. Countries such as Italy, Spain, Greece and Cyprus still feel consequence of economic crisis on their financial sector. An overview of the mean values of all indicators of economic freedom in the world and Europe, as well as the minimum and maximum values achieved in the period from 1995 to 2016 according to the Index of Economic Freedom of the Heritage Foundation is given in Table 2. The positions in which Europe is below the world average, and what was discussed more than once are Fiscal Freedom and Government Spending.

World	Number of observations	Middle value	Standard deviation	Minimum	Maximum
Europe					
Index of Economic Freedom	22	59.15455	1.125771	57.1	60.7
	22	64.15	3.005986	57.5	67.1
Property rights	22	47.88636	4.828023	42	56.2
	22	62.65	2.055828	59.8	67
Freedom from corruption	22	40.44091	.9292389	39.3	42.6
	22	54.76364	2.525403	45.8	57.6
Fiscal freedom	22	72.34091	6.220357	64.2	78
	22	65.70455	4.919413	53.6	72.9
Government spending	22	66.76818	1.823494	62.2	69.6
	22	44.4	3.437469	36.3	50.1
Business freedom	22	64.35	1.405347	62.3	68.5
	22	73.03636	4.011121	66.5	77.6
Labor freedom	12	61.35833	.6999459	59.7	62.4
	12	61.58333	.8343025	59.5	62.8
Monetary freedom	22	73.87273	3.315215	67.2	78.1
	22	75.90909	4.321476	66.3	81.5
Trade freedom	22	68.23636	6.522455	58.5	76.1
	22	79.13182	5.974978	69.2	86.7
Investment freedom	22	53.45	2.67239	48.8	58
	22	66.21364	4.14514	60.7	74.1
Financial freedom	22	53.45	2.67239	48.8	58
	22	66.21364	4.14514	60.7	74.1

*Table 2: Mean, minimum and maximum achieved values of all indicators of economic freedom in the world and Europe in a period of 22 years  
 (Source: Author's calculation)*

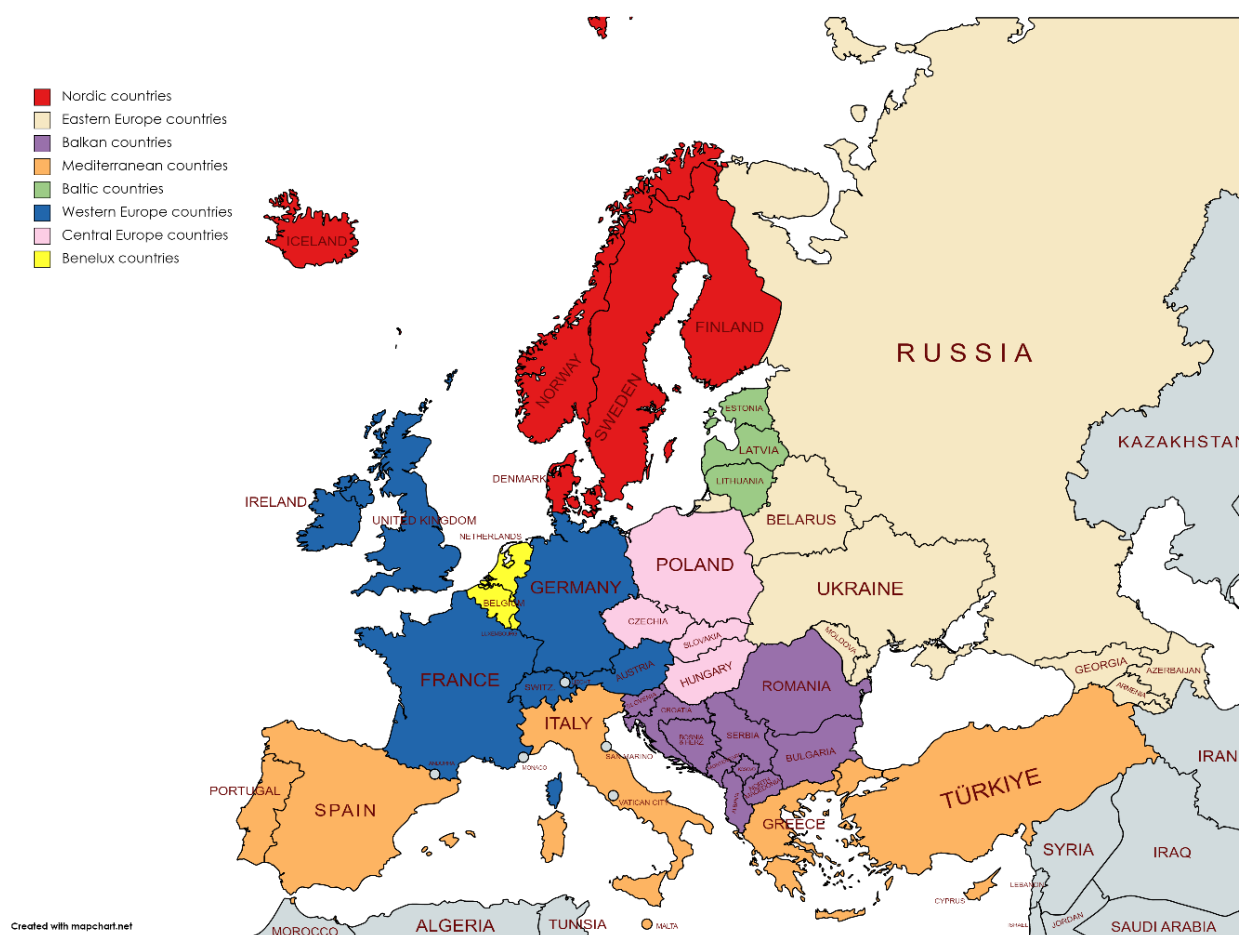
From the beginning of the measurement until 2016, economic freedom in Europe increased by almost eight points (Chart 3). The growth of monetary and fiscal freedom, freedom of trade and investment significantly contributed to this. The decline is noticeable in the protection of property rights and freedom of work.



*Graph 3: Change in the Index of Economic Freedom and its components in relation to the initial year of measurement - comparison of Europe and the world  
 (Source: The author, adjusted according to data taken from [www.heritage.org](http://www.heritage.org))*

#### **4. PRESENTATION OF THE STATE OF ECONOMIC FREEDOM WITHIN GROUPS OF EUROPEAN COUNTRIES**

Overview of the economic freedom condition is given in the following sections. Circular moving in the observing years for the exact group of countries into the regions from the geopolitical aspects are shown (Picture 2). Macroeconomic indicators are taken into consideration in the analysis construction which are directly influence on forming Economic index of freedom and taking the exact rank position on world and European level.



*Picture 1: Regional division European region made from Heritage Foundation  
 (Source: Authors)*

In the Heritage foundation report from 2016, all of three Baltic's countries are in the group of mostly free economies, with ninth, thirteen and thirty sixth place (Estonia, Lithuania and Latvia, respectively). The main parameters that determined Baltic's countries as a mostly free countries are open market, normative frames and the rule of law which is driven by independent judiciary system. Efficient management of public finances and relatively easy tax system are factors of well driven fiscal politics, although public debt is around 40%, it is still burdening Lithuania and Latvia, while Estonia long time keeping debt above 10%. Thanks to institutional opening flexibility, these countries have impressive capacity for adapting on external risks, while on the other side is still risk from corruption, and limitation on labor market, especially in Latvia. Extremely high Economic Indexes of freedom are known for Nordic countries, with the long-term strategy for politic of open market with dynamic trade and investments. These group of countries are known as a modern markets and quite high life standard. Nevertheless, judiciary standards and transparent rule of law are also implemented long time ago. Minimal percent of corruption is as well one of the main points for high percent of freedom economy. A huge government spending and non-flexibility of workers are the most important burdening factors. Although Denmark is honoring with liberal market and law of work (easy way of hiring and firing workers), with flexible working hours, without restriction for night or weekend shifts, other Nordic countries are placed above or around world's average, where except law of minimal income, they cannot praise with liberalization in this area. Progressive taxes, social programs and huge transfers and welfare are synonyms for Nordic countries. These characteristics are placing their positions on the economic freedom scale, but it is also valuing them higher than other European and world countries.

Mediterranean countries are in the group of moderate free economies, except Greece which are known as mostly unfree country because of economic and debt crisis. Together, Mediterranean countries have the same problem because all of them are recovering from the economic crisis. Their goal was to take painful reforms to recover bank sector, to reduce number of employees in the public sector and to raise efficiency of public companies. These countries are characterized by high level of opening to the global market and investments, which pushed economic index of freedom up, but still high government intensions, big unemployment especially between young population and non-predictable future about economic growth holds the index. Although in most countries law keeps property, execution of contracts and resolution of cases is slow. Especially negative influence on the indicator of economic freedom in Mediterranean countries goes to big taxes burden, non-flexible labor market, poorly managing public finances and corruption. Between these countries is important to mention Turkey which made a stable and significant economic growth, despite the unstable political situation. On the other side, institutional weaknesses and pressure on judiciary restraining economic freedom in Turkey and restrain more dynamic growth of private sector. Economy of Western Europe countries thanks to efficient diversification, maximum opening to the global market, well protect property rights and high level of flexibility and stability, counting between the most competitive and most innovative economies in the world. Nevertheless, characteristic such as relative resilience on the external factors, institutional functionality and transparent judiciary system bring to almost no corruption influence. On the other hand, economic freedom is restrained with the lack of control in the government spending and strict labor market, while France faces with the serious corruption in area of public work and defend industry. Between mentioned countries, Switzerland is thanks to measures effectively eliminated shortage on the labor market and in the managing public finances, always among the best placed on the world list of economic free countries. Also, a highly ranked place is always occupied by Ireland, which, through the restructuring of the banking sector, disciplined fiscal measures and a sharp reduction in wages in the public sector, regained its fiscal health and entered the group of the fastest growing economies in the Eurozone. High value of Index of Economic Freedom that are valuing Netherland and Luxemburg are based on the absolutely opening to global trade and investments, continuously maintenance competitive and flexible business environment, well normative framework and continuously implementation laws that protects property rights. Also, these countries are dedicated to implement measures to heal public finances and fiscal institutions, with tradition of avoiding corruption and well organized and functional institutions. The main obstacles to the improving level of the economic freedom, insufficient effective managing in public finances in Netherland, and relative closed labor market in Luxemburg. Opposite, Belgium faces with many problems, although it has many well features, this country is ranked way worse than Netherland and Luxemburg. These problems are related to the huge government spending which is caused for public debt to go above 100%, strict labor market and high level of taxes. Further, Belgium is facing, especially in the last ten years, with the serious political non-stability internally, which results in bigger and bigger animosity between Walloons and Flemings. Switching from central-plan economy to market economy in Central Europe countries, came from multi-year progress in restructuring and liberalization, which resulted with stable and flexible economies. Thanks to opening to global trade and investments, relative low taxes and efficient function of property rights, these countries are counted among the most attractive locations for foreign direct investments. The main problems are related to managing public finances and fight against corruption, where Czech Republic and Poland in the following period showed significant progress in these areas, which impacted on their better position on the world's ranking economy free countries. On the other side, Slovakia and Poland are still face with nepotism and chronic corruption serious range, especially in the area of higher education, public health care and government companies.



Ukraine, Belarus and Russia already long time struggling with a huge systemic corruption, hard pressence and control business from the government, complex birocratic procedure and non-transparent and non-efficient judiciary activites, which all of these points classifying them among countries with mostly unfree economics freedom between European countries. Among everything said, the Russian-Ukranian war has made their economies more difficult to deal with, making political connections the worst in history. War has brought to the world high inflation and disorder in supply chain, where Russia and Ukrania are one of the biggest exporters of commodities in the world, and with stopped exporting, the world is suffering in many ways such as high prices of fuel, gas, food and other. In Ukraine, unstable political environment, Belarus unstable property rights which is driven from the Soviet era, and also lack of honest political will in Russia to start strucutral reforms are all reasons of the current state. Economies of Moldavia and Armenia have similar strugglings but in the less scope. These countries, especially Armenia, made a significant progress in areas of economic diversification, progressing of business environment, liberalization of trade and controlling of government spending. Georgia is among these countries most free, which economy despite of serious global and regional challenges, in the continuity makes enviable elasticity. For better positioning contributed discipline of implementing measures to get rid off corruption, fiscal consolidation and keeping macroeconomic stability. Deep structural reforms that are counducted, including banks privatiozation and measures related to economic liberal activity, building stable and competitive business environment, as well as modernization of regulation, enabled opening growth and flexibility, with visible progress of Macedonian, Albanian, Bulgarian, Romanian and Montenegro economies. Their visibility in the area of “moderate free” economies justifies primarily with low tax rates (relative low tax burden), as well as completely opened banking sector, where most banks are in private property. Despite enviable success in many areas, further realization on reduction plan of strict labor market and raising the level of efficiency of judiciary system, which are still under the big political influence, presents the main importance for these countries. There is a great need for getting back on the right patway in terms of fiscal discipline for these group of countries, whereby in this region the best results made Bulgaria and Macedonia, with significant reduction of public debt. Between this group of countries, except frequent institutional problems related to protection of property rights, the most pronounced factor is corruption, which is still a big problem for long-term economic growth and development. Although Croatia, and especially Slovenia, stand out with the biggest BDP per capita in this group of countries, their indexes of economic freedom mark drop since 2010, which is related to high public debt in both countries, large number of financial institution in government possession and significant tax burden in Slovenia, and spreaded corruption and hard birocracy in Croatia. Bosnia and Herzegovina is the least economic free country on Balkans already many years ago, which economic performances are significant damaged, partially due to global economic crisis, and mostly due to absence of rule of law, poorly managing of public finances and fact that privatization is not implemented to the end (government still manages a large number of companies). Also, Bosnia and Herzegovina struggles with obviously not a little of corruption, a big political influence on judiciary system, and lack of will and resources to deal with main criminal organisations.

## **5. ECONOMIC FREEDOM IN SERBIA**

Serbia in the past period has taken serious institutional and political reforms, while low level of corporate tax and relative opening to global trade in a huge measure relieved process of regulatory efficiency, and new rules are defined and implemented and they are directed to regulation of bankruptcy proceedings and labor relations, while the banking sector was revived through privatization and consolidation. However, in spite of visible progress that are Serbian government made in terms of progressing work of public authority, and raising the level of



transparency and responsibility of public procurement, also as the most significant problem, next to large unemployment (especially between young population) stands out corruption significantly. Also, implementing the plan of protection property rights is very slow, while excessive government spending is still disabling dynamic development of private sector. A constant budget deficit is visible for Serbia, with the reason that the main users are government firms, especially from the sphere of transport and energy, which constantly operate in loss. With this in line, a public debt of Serbia goes around 53% of GDP. Serbia is characterized with significantly lower level of tax comparing to most developed European countries, with the following income taxes: wages and independent activities 10%, for income from capital and capital gains 15%, for other types of income 20%. The overall tax burden approximately of a one third of GDP, while on the other side, Serbia has average custom rate of 6.5% which is among the highest in Europe. Other than that, the procedure of starting a business is ultimately simplified, whereby just six administrative procedures and do not require a minimal capital, and domestic and foreign investors mostly have the same treatment from the government. Opposite, modern and functional labor market is still not completely developed, due to which a large part of the economic activities still not realized and without proper supervision of government, in the so called "gray area". The economic index of freedom for Serbia is in from 2008 to 2013 shows mild growth, which caused that Serbia in that period was on 38 and 37 position between European countries. With that, the majority of sub-indexes in the same period showed relative constant level, while continuously tax indiscipline and significant growth of government spending, which is compensated with intensive progress in investment area, and in mind that with certain success reforms are carried out. These reforms are carried out on the plan for progressing investment environment and opening economic sectors for foreign investments.

Indexed year	2008	2009	2010	2011	2012	2013	2014	2015
<b>Index of economic freedom</b>	56.6	56.9	58	58	58.6	59.4	60	62.1
<b>Property rights</b>	40	40	40	40	40	40	45	50
<b>Freedom from corruption</b>	34	34	35	35	33	34	42	41
<b>Fiscal freedom</b>	85.9	83.2	83.6	84.1	84.2	83.1	82.4	84.3
<b>Public spending</b>	46.3	41.4	41.9	39.3	40.3	38.6	27.1	44.1
<b>Business freedom</b>	56	58.9	59	56.5	60.2	59.3	57.8	60.2
<b>Job freedom</b>	70	72.2	68.9	68.7	70.4	70.1	70.4	66.2
<b>Monetary freedom</b>	65.8	64.5	66	68	65.3	66.9	72.2	77.5
<b>Trade freedom</b>	78	75.2	75.2	77.9	77.9	77	78.2	77.8
<b>Investment freedom</b>	40	50	60	60	65	75	75	70
<b>Financial freedom</b>	50	50	50	50	50	50	50	50

*Table 3: Movement of the index of economic freedom and its categories in Serbia  
 (Source: Authors, adjusted according to data downloaded from [www.heritage.org](http://www.heritage.org))*

In later years, Serbia achieved another progress and jump to 33-rd place economic free countries in Europe, especially thanks to strict measures of fiscal consolidation with whom are reduced and frozen pensions and salaries in the public sector, and improved payment of tax revenue. Also, 2014 and 2015 are characteristic for significant growth of sub-index that are related to protection of property rights and fight against corruption. However, it has to be emphasized that these moving are firstly consequence of promises and optimistic expecting based on bring the Rule of public procurement and Nacional strategy for fight against corruption, while in the practice in Serbia still characterizes non-implementation rules and strategic documents directed on suppression of corruption, and absence of responsibility for breaking obligations and terms that are comes from them.

## 6. CONCLUSION

From the beginning of measuring Index of Economic Freedom, the world has made a low progress. The reason for that trend could be found in adding the number of observing countries, which are mostly emerging economies with low average (Wu, 2011). Comparing eight regions inside of European region, it could be seen that all regions are made progress in economic freedom compare to the first year of measuring. The difference between regions is visible in the intensity of progress. Countries of Western Europe, Nordic countries and countries of Benelux made a significantly bigger progress than others, but relative the biggest progress made countries of eastern Europe, Central Europe and Balkans, which is in line with the theory of convergent. Naturally, it was expected that countries with the lower positions had larger space for progress compare to countries which is index of freedom high and do not give enough space for visible rise. Countries that are in desirable positions on economic freedom, is expected from them to keep and sustain stability, continuity and put the focus on economic politics for which is important to improve. Baltic countries are absolute champions in progress of economic freedom recording growth from 12.63 points which are made from 1995 to 2000, which represents intensive period their process of transition. The same could be written for Balkan countries, which progress got exactly in the peak period of transition from 2000 to 2005, making the growth of 7.72 points according to the scale of freedom, as well as countries of Eastern Europe where freedom increased with 13 points in the decade between switching from 20 to 21 century. In Mediterranean countries is visible drop of economic freedom, which is consequence of the influence of the world economic crisis from 2008 that made a significant effects on their economy and unemployment, as well as facts that Greece, which was deep in debts, is part of this group of countries. West Europe keeps stability, as well as Nordic countries, while Benelux countries have tendency of drop most of all because of huge public spending, high public debt and high taxes which represent main problems that Belgium is facing, as one of the three countries from this region. Considering the state in Serbia, it could be concluded that is necessary to make more effort to repress corruption, to reduce and to speed up bureaucracy, as well as to strength judiciary system which is ultimately on politics influence, in order to promote and advance economic freedom and consequently improve economic (and every other) growth and development.

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## THE MIGRANT ENTREPRENEURSHIP – HISTORY, TRENDS, CHALLENGES, AND PERSPECTIVES IN THE REPUBLIC OF CROATIA

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### ABSTRACT

*The paper explores and describes the importance and the role of migrant entrepreneurship, emphasizing trends and perspectives in the EU countries compared to the Republic of Croatia. Migrant entrepreneurship characterizes entrepreneurial activities and ventures undertaken by individuals outside the countries where they were born or raised. In contrast, migrants are people who leave their countries of birth to strive for more opportunities and personal growth. Immigrants are more entrepreneurial and likely to take risks than domestic residents. A strong affirmation of multiculturalism is highly associated with migrant entrepreneurship. The methods used are historical, desk research, analysis, synthesis, and comparison. The paper is written as secondary research using available domestic and foreign literature as a source of data collection. Research results are based on the extensive review of secondary data and historical research, identifying significant trends in migrant entrepreneurship in western Europe and the US. Additionally, challenges and aspects of migrant entrepreneurship in Croatia show legislative barriers and a lack of measures to support and encourage migrant entrepreneurship. Migrant entrepreneurship is slowly growing in Croatia but still not significantly impacting the local economy compared to the western European countries. It is necessary to raise awareness of the positive effects of migrant entrepreneurship, emphasizing an excellent opportunity to reduce unemployment and contribute to economic growth.*

**Keywords:** *migrant entrepreneurship, migrants, minority entrepreneurship*

### 1. INTRODUCTION

Based on the theoretical knowledge of ethnic entrepreneurship, it can be determined that there is a necessity for the unification of entrepreneurship in all its spheres and forms, especially in the part that relates to the equal, effective, and efficient inclusion of ethnic minorities in different entrepreneurial organizations. Accepting diversity, entrepreneurs provide the starting assumptions for engaging employees with various demographic features, maximizing their knowledge, communication capabilities, skills, and talent. Subsequently, there is no waste of resources and energy, which positively reflects the achievement of organizational goals. It is constituted as a genuinely multicultural organization of power that can provide dynamics and its own organizational culture. Entrepreneurship is creating something valuable and new by devoting the necessary time and effort, assuming the accompanying financial, psychic, and social risk, and receiving the resulting rewards of monetary and personal satisfaction and independence (Hisrich, 2008). Entrepreneurship is a widely known concept that has been explored for a long time. Today it develops in different directions, following the dynamics of change or creating changes. Entrepreneurship is a phenomenon altering economies and industries around the world. Entrepreneurs are considered critical drivers of economic growth, new job generators, and holders of new products and services. Entrepreneurial perception develops in an individual, within or outside the organization, in profit or non-profit organizations. By observing the global market, it is possible to perceive many innovations in entrepreneurship, from different forms of entrepreneurship to sources of financing, market access, ideas development, business models, technology selection, Business virtualization, and

strategic orientation (Stilin, 2019). According to the research conducted by Dabić et al., most of the research is located in countries attracting large numbers of migrants, such as the USA, the United Kingdom, and Canada (Dabić et al., 2020). Due to increased migration in EU countries, some studies explore migrant entrepreneurship in EU member states. According to the 2015 OECD report, the country with the most migrants in the world is Germany (Szarucki, 2016). Szarucki and colleagues have studied migrant entrepreneurship in Germany, on the example of migrants from Romania and Poland. In addition, Croatia records an increase in migration, and thus the number of entrepreneurs considered migrant entrepreneurs. The paper gives an overview of immigrants to the Republic of Croatia from the perspective of migrant entrepreneurs. There are currently more and more entrepreneurs motivated by the opportunities for entrepreneurship abroad. Unfortunately, the current COVID-19 pandemic makes it difficult for all entrepreneurs to do business. However, with innovative ideas, it is possible to maintain a successful business and thus ensure the livelihood of both the domestic population and immigrants. This research paper applies desk research methodology, and the data collected is secondary data provided by scientific and professional sources.

## **2. HISTORY AND GLOBAL TRENDS IN ENTREPRENEURSHIP**

Global trends are changing rapidly, and entrepreneurs are seen as individuals who recognize an opportunity where others see chaos and confusion. Entrepreneurship requires seeking opportunities, taking risks, and continuous persistence. Economic, social, and technological changes have influenced how they are employed. The shift takes place in the direction of self-employment. Fewer large companies offer long-term job security, planned wage growth, and ensured healthcare for loyalty and employee dedication. Many authors believe that future entrepreneurs differ substantially from their predecessors in age, origin, and gender. It will create many opportunities, as well as changes on a global scale. Entrepreneurs will no longer be middle-aged but retired individuals and their children (Wilmouth, 2016). The high unemployment rate and lifestyle changes have created a new group of young entrepreneurs. According to World Survey, Global Entrepreneurship Monitor, almost 50% of entrepreneurs worldwide are between 25 and 44 years old, with the highest level of entrepreneurial activity between 25 and 34 years of age. These ambitious young people have acquired some work experience, resources, and acquaintances but need a sufficient salary and position in the organization that would retain them (Monitor, 2019). Unfortunately, in Croatia, young people's participation in entrepreneurial activity is declining (GEM, 2016). These young people may be hiring their parents, which changes the idea of family entrepreneurship by making it reversed by becoming a parent to parents. The new trend is the increasing empowerment of women who have failed to thrive because of the "glass ceiling," which is increasingly turning to entrepreneurial ventures. With the awareness that is owning an "entrepreneurial line" is not enough to achieve success, it is necessary to possess specific knowledge and skills. As a result, the number of immigrants who start their businesses grows. They are mainly triggered to start a new business out of necessity (Fairlie, 2012).

### **2.1. Migrant entrepreneurship**

Migrations are a multidisciplinary area of research where geography, demography, anthropology, economics, urban and rural planning, and sociology play an essential role (D. Babić, n.d.). Brettel and Hollifield cite the importance of a multidisciplinary approach to migration, describing that each science has its research and perspectives: "Every migration involves movement, but any movement is not migration" (M. Mesic, n.d.). "Migration in a broader sense implies any form of resettlement, temporary or permanent alteration of the place of residence from one area (country, region, or city) to another. In a narrow sense, it refers only to permanent changes in the place of residence, while the term circulation refers to temporary

changes" (Smuggling, 2005). Migrant entrepreneurs' access to resources and knowledge depends on their embeddedness in different types of networks. For example, it depends on their relational (e.g., business networks), social (e.g., community networks), and structural embeddedness (e.g., institutional networks) in both the home and the host country (Lassalle et al., 2020). Migration can be viewed as a relationship between macro and microstructures. According to Grbić-Jakopović, "The concept of macrostructures implies the political economy of the world market, inter-state relations, laws, state control of the mobility of involved States, as well as global international relations." On the other hand, microstructures imply "informal social networks created by migrants to help overcome difficulties in the alien." (Jakopović, 2014). Migration has profoundly impacted throughout history but still impacts European states' ethnic, cultural, and religious diversity. Managing and controlling migration and controlling them continuously and integrating migrant groups have become key to the constitution of the European Union in recent decades (Gregurović, 2020). Today, the concept of minorities binds to national-ethnic-linguistic groups. According to the UN, it is defined as any group of persons who reside in a sovereign state that constitutes less than half of the national society and whose members share standard ethnic, religious, or linguistic features different from the rest of the population. Therefore, migration can only be understood if the socio-political context is considered. Mesic, while exploring migration in three different phases of the society's development, binds three types of external migration: the first refers to migration as an escape from a closed society (Jakopović, 2014). When boundaries are closed to leaving the home country but open to immigration, migration becomes almost impossible. Those who managed to leave the state knew their actions were illegal. The second phase of social development is characterized by bidirectional. The boundaries were open to entry and exit, and this phenomenon was topical in 1960. Also, the advent of a surplus labor force going to temporary work overseas loses its opposing sign. The last stage Mesic describes as "an exit necessary — entry closed." It emerged at the beginning of the recession in western European countries when it started implementing restrictive policies toward migrants, especially those without higher education (M. Mesic, n.d.). Entrepreneurship within national minorities, or the so-called Minority entrepreneurship, is an integral part of the development of economic activity and a confirmation of the strengthening of human rights. The national minority is a group of Croatian citizens who inhabit the territory of the Republic of Croatia. At the same time, their membership has ethnic, linguistic, and religious characteristics distinct from other citizens who want to preserve it (Constitutional Law on the Rights of National Minorities, 2000). The Croatian Employment Service (2015) identifies the national minority as an endangered group in employment and the exercise of labor market rights. Therefore, some national minorities are the bulk of their business through family entrepreneurial activity. Minority entrepreneurship is explained in the context of marginalized groups. Amongst authors in the United States, it is more often identified and associated with family or social entrepreneurship (Fertala N. 2006., n.d.). The same is due to a strong connection between minority families and other minority members (Li, 2001). Minority entrepreneurship means "investing its capital in a business venture marked by an individual's sociological and cultural characteristics but under the acquis of the host country." Many European Union countries have no defined notion of minority entrepreneurship, but the definitions from the literature include two elements: self-employment and cultural differences. These two elements are also often referred to as forms of self-employment of discriminated groups in the labor market. The European Foundation for the promotion of living and working conditions, minority or ethnic entrepreneurship is defined as the "working or professional activity of national minorities for profit-generating, opportunities for self-employment, customs, and various skills and knowledge related to their cultural heritage." (Hout & Rosen, 2000). From the German perspective, minority entrepreneurship is described as "a form of family entrepreneurship with elements of tradition and cultural

diversity, which aims to achieve greater employment of national minorities in the German labor market." (Fertala N. 2006., n.d.). The Organisation for Economic Co-operation and Development adds two more sociological dimensions to minority Entrepreneurship: 1) The ability to maintain identity and cultural heritage and 2) the sustainability and self-financing of minority communities. Wishing to tackle social issues and social exclusion of national minorities, Croatia accepted the principles and guidelines of the European Commission obliging measures to encourage minority entrepreneurship. However, the involvement of public authorities in supporting and advising minority entrepreneurs is still insufficient, although, at the local level, there are councils of national minorities that should take care of this. An example is the Office for Human Rights and the rights of national Minorities of the Republic of Croatia (OECD, 2010). Although empirical research on the connection between immigration and entrepreneurship is scarce, the theories are divided into two groups: the first relates to identifying the specific characteristics of immigrants to explain differences in the tendency to start a job compared to "non-immigrants." The second group focuses on the institutional and cultural environment in the host country (Peroni, 2015). According to previous research, the first group of immigrants has a better chance of starting a new job because of different shortcomings (linguistic, racial, educational) that encourage them to engage in entrepreneurial activities. Some authors believe that immigrants are more prone to self-employment to avoid less-paid jobs or those where they cannot thrive. Other researchers highlight the cultural characteristics of the country from which they originate. If the tendency to self-employment in the country of origin is more pronounced, the immigrant in the host country is more likely to embark on an entrepreneurial venture. It emphasizes the role of social networking with a country of origin that gives them easy access to resources (e.g., labor force, information, capital) needed to start a business. Another approach explains immigrants' involvement in entrepreneurship by focusing on the interaction between the individual characteristics of immigrants and the institutions and characteristics of the country and the host market. Today's migratory waves due to searching for better working and living conditions or escaping war events in their own country create additional pressure on employment in the host country. In addition to shaping appropriate educational programs, it is possible to encourage immigrants to self-employment (especially in situations where they need to be sufficiently educated). Berthomière (2000) studied the Immigration of Jews (more than 800,000) to Israel after the collapse of the Soviet bloc. Immigrants made highly skilled personnel, but there was a mismatch between the qualifications that these immigrants had and those that the Israeli employers needed. Facing this problem and launching a refusal to continue accepting unskilled jobs, an increasing number of former Soviets establish their own company, resulting in a negligible number of new entrepreneurs and social success. Project manager René Leicht and his team from the Institute for Research of Secondary entrepreneurship at the University of Mannheim examined "the significance of the ethnic economy for Germany and highlighted that the number of independent settlers in Germany in the last 15 Years had risen significantly. For example, the number of business-independent Turks over the period has almost doubled. The number of Italians has risen by 50%, mainly in hospitality and trade. Interestingly, in 2003, Germany had a total of 285 000 independent entrepreneurs of foreign origin. The experts are pleased that foreign entrepreneurs in Germany are opening new jobs, though predominantly for members of their ethnic groups; this also unites the labor market, as it is right among foreigners – for example, among Turks or Italians – unemployment is substantial. Immigrants with their own companies in Germany have opened nearly a million jobs. Admittedly, the "ethnic economy" is a significant concentration in catering and trade primarily because the two sectors are characterized by relatively low barriers to market access and high competition (Ulrich, 2005). Ulla-Kristina Schuleri-Hartje from the German Institute for Urbanism in Berlin says: "When you think about why immigrants become independent and establish their own companies, it is,

on the one hand, a way out of unemployment, which has just in recent years led to the fact that more and more settlers became independent. However, it is also about the motivational potential behind such a decision – they want to be their boss. Some ethnic groups are still from their homeland, accustomed to trade and entrepreneurship, and feel relatively safe in these areas" (Ulrich, 2005) . Ulla-Kristina Schuleri-Hartje also studied the "ethnic economy" as an integration factor, indicating the large discount shops pushing small shop owners out of the market. The entrepreneurs of foreign origin set up small shops instead. As a meeting point for different cultures, they contribute to a peaceful understanding between foreigners and Germans. The store owner can, therefore, fully advertise for himself "that as an immigrant he acquires the opportunity for personal gain, but at the same time encourages the co-existence of citizens – German and foreign customers, who meet in his shop. Moreover, this strongly strengthens the social function" (Ulrich, 2005) . However, the study also resulted in this: immigrants are below average in higher sectors such as service activities, law, and consultancy. The authors, therefore, require better conditions to raise the level of education among ethnic groups, but also more accessible access to independent entrepreneurship, especially for non-EU nationals, and to improve the supply of information and Advisory services for independent entrepreneurs of foreign origin (Ulrich, 2005). The intention of Ayse Caglar, from 2011th, teaching at the Department of Social and Cultural anthropology of the University of Vienna, was to accommodate migrant entrepreneurship in local contexts of city restructuring. The same was presented in a lecture organized under the project "Creation of the city: space, culture and identity" in cooperation with the Platform for Mobility and international cooperation between ethnologists and cultural anthropologists (Kulturpunkt. hr, 2017). A study on the dynamics of immigrant/ethnic entrepreneurship in different regimes of the social states through the prism of the theoretical frameworks developed in the USA and Europe by Jevšnik describes theoretical reflections on immigrant/ethnic entrepreneurship in the context of the social state. It proves that in Europe, vice versa, than in the United States, it is mainly politically encouraged economic activity with a hidden goal of integrating immigrants into the majority society and preserving support for financial redistribution within the social state regime. These differences originate from the conditions created by social states and strongly influence the development of theories of ethnic entrepreneurship on two continents (Vah Jevšnik, 2019). In the United States, where the proportion of minorities in society is significant and where the private sector is developed, minority entrepreneurship is a well-known term (Tranfic, 2017). According to research from 2010th, minorities In the United States met with obstacles and discrimination in the approaching capital for business development. For small minority companies, it is harder to get loans in comparison to non-minority. The number of loan applicants from minorities is smaller because of the fear of rejection. An example of the USA shows that minority entrepreneurs face problems establishing contacts and accessing community investors for racial, class, and gender reasons. When the system fails, the crowdfunding campaign and platform provide the option for gatherings of the minority community as a source of support in this crucial time. Besides this, they create space for connecting without discrimination. With an excellent crowdfunding platform, a platform such as Plum Alley gives minority entrepreneurs in the United States the possibility of more accessible access to capital for women. They are creating an inclusive community and 'Ecosystem' of investors to assist women in acquiring more considerable amounts of capital. The organization known as The Black Founders helps to increase the number of successful black entrepreneurs in the technology sector and encourages economic development in African communities. Crowdfunding and social entrepreneurship are surfaced as one alternative model of funding that opens space for the development of minority entrepreneurship. The crowdfunding Academy also significantly contributes to the same, providing needed knowledge and skills to students. The growing number of projects is aimed at persons with disabilities, refugees, minorities, and other marginalized groups.



Positive effects should, over time, contribute to more outstanding institutional support and educational investment in the entrepreneurial sector. Creating a community and focusing social and financial capital on socially beneficial projects thus opens a new and exciting chapter in integrating and fostering minority entrepreneurship (Tranfic, 2017). According to Kekus from the Centre for Peace Studies, migrant entrepreneurship positively affects the economy of the country they immigrated to because they create new jobs and contribute to the development of innovations with new ideas in business. Migrant entrepreneurship also affects social aspects, such as improving the self-confidence of migrants and fostering social leadership (Kekus, 2017). Research conducted in 2009 by Asc on the topic "High-Tech Immigrant Entrepreneurship in the US" led to the conclusion that migrants play a crucial role in opening high-tech companies in the US. However, most migrants have lived in the US for years, have US citizenship, and have been educated in American colleges and schools. Moreover, these companies are located in areas with a high concentration of migrants. Therefore, it is a migration policy that is considered positive because it will influence educated and experienced residents to engage in high technology (Asc, 2009). In 2010, Piperopoulos, in his research "Ethnic minority businesses and immigrant entrepreneurship in Greece," concluded that immigrant entrepreneurs were pushed to self-employment due to race discrimination or limited opportunities to work. Once they establish an EMB, they will rely on ethnic resources, employ family members, and use inside knowledge to spot an opportunity in the business landscape. On the other hand, ethnic entrepreneurs are pulled to entrepreneurship by an opportunity they see serving a specific consumer demand. However, these entrepreneurs will also use ethnic resources and family support even after establishing an EMB (Piperopoulos, 2010). In 2015, Grosu published a research, "Dynamics of Immigrant Entrepreneurship in Romania," which discusses how migrant entrepreneurship has become a fundamental phenomenon in Romania and that Romania is attractive for starting a business. It is the position of Romania, its membership in the EU, but also the historical connection that attracts migrants from Turkey to start a business (Grosu, 2015). In 2017, Paoloni et al. researched entrepreneurship among migrant women in Italy. The conclusion is that the quest for independence, the desire to move away from a condition of hierarchical subordination, and the desire to carry on their investment projects make immigrant businesses more and more similar to native businesses. However, the difficulties of the migratory path and the precarious living conditions in the host country cause a lack of confidence among immigrant women entrepreneurs concerning other actors involved in business development (Paoloni et al., 2017). In 2018, Kalitanyi and Khosa conducted research in South Africa. As a result, they concluded that migrants, mostly from African countries, do not receive financial assistance from the government, so they decide to start entrepreneurship. Entrepreneurship education is considered necessary, but most migrants lack general education apart from entrepreneurship education (Kalitanyi & Khosa, 2018). Vázquez de la Torre et al., in their research from 2019, analyzed the profile of migrant entrepreneurs in Spain. The analysis showed that most migrants come from Latin countries and EU countries. However, the number of migrants from EU countries is increasing despite the similarities in language with Latin countries. Of the total number of migrants in Spain, most are migrants with primary and secondary education, 86% are self-employed, and most are employed in the tertiary sector. The crisis in 2009 contributed to significant job losses among migrants and their emigration, while those who stayed behind decided to open their businesses (Vázquez de la Torre et al., 2019). In 2019, Ngota et al. published research on skills transferred among the migrant population, and the difficulty of successful skills transfer was confirmed. Immigrant entrepreneurs expressed different ways to convey skills ranging from training, experience, and session (Ngota et al., 2019). In the year 2009, Taniguti conducted research on the topic "Entrepreneurship and consumption of Brazilian immigrants in Japan" in 2017, Munkejord conducted research "Becoming Spatially Embedded: Findings from a Study on Rural

Immigrant Entrepreneurship in Norway" 2019 Torre, Rojas, and Navajas-Romero on the topic "Analysis of the Entrepreneurial Immigrant Profile in Spain," research on the topic "Characterizing Russian Immigration Entrepreneurship in Finland" was conducted in the year 2007 by Jumpponen, Ikävalko, and Karandassov, and in the same year Levie researched the subject "Immigration, in-migration, ethnicity and entrepreneurship in the United Kingdom.". In 2016 Stakanov researched "Influence of Immigrants on the Entrepreneurship Development in the Host Countries," while Mosbach, Debili, and Merazga in 2018 researched "First-generation immigrant entrepreneurship in Malaysia: What do we know so far?". In addition to the above, many authors have researched migrant entrepreneurship in different countries.

## **2.2. Research results - Challenges and perspectives in Croatia**

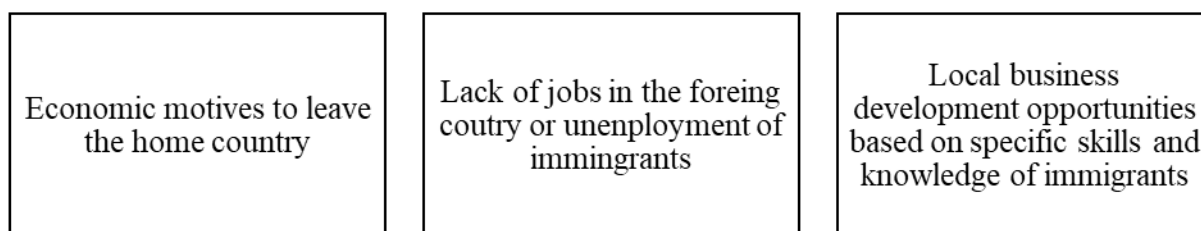
In the second decade of the 21st century, the European Union faced huge migratory waves of millions of people from third countries. Unlike the 19th and 20th centuries, migrations today are prompted by war and interethnic conflicts. It applies to Syria, Iraq, Afghanistan, and other Middle Eastern countries. The challenges facing the European Union are at several levels: economic, political, and social, and have become a platform for defining multicultural openness. During 2015th and 2016th, hundreds of thousands of migrants from third countries passed through the Republic of Croatia. They mostly moved toward Western countries, primarily the Federal Republic of Germany. A relatively small number of asylum seekers in the Republic of Croatia was more than sufficient to confront the government and the civil sector with many unknown problems and challenges of political, economic, humanitarian, and intercultural nature. Although Germany has a relatively elaborate plan to accept migrants, Croatia has just begun to face this challenge. (Đaić, 2018) There is no research into the entrepreneurial activities of immigrants in Croatia because it is viewed as an emigration rather than an immigration country. However, labor mobility trends over the last ten years suggest that Croatia is no longer an exclusive emigrant country but is increasingly becoming a labor immigration country (Božić, 2013). A survey conducted by Božić (2013) states that over 50% of respondents come to Croatia for higher earning potential, although their income is markedly lower than the Croatian average. However, this is more than they would have received in their own country, stating that they generally had no financial difficulties. It is a relatively less educated population compared to the total population of Croatia and Bosnia and Herzegovina, from which they most often come. However, compared to the total population of foreign workers, workers are either professionally educated for their job or perform work below their education level. Furthermore, most of them plan to stay in Croatia, so it can be concluded that only a few respondents see their stay in Croatia as temporary. Although this area is not covered by previous research, it is possible to assume that respondents are unlikely to engage in entrepreneurial ventures under the circumstances. Launching entrepreneurial ventures (measured by the TEA index) in Croatia from 2012th to 2015th is at a level of about 8%, which is an average of the EU, but more significantly below the average of the countries to whose development group Croatia belongs. In addition, Croatia's motivational index in favor of business ventures is due to the perceived opportunity. However, it is among the lowest in the EU and a group of countries of the same development level. Moreover, in 2014th and 2015th, Croatia had the lowest motivational index among EU countries, approaching figure 1 in 2014th. It means there were almost as many entrepreneurs who started a business venture due to the perceived opportunity and those who did so because they had no other choice. Therefore, it is not expected that immigrants will significantly affect the change in these indicators. Croatia lacks entrepreneurial culture, and the existing regulatory, financial, and tax framework does not favor the significant development of entrepreneurial activities. Also, immigrants come from a country that describes a similar environment (GEM, 2016).

Nevertheless, migration trends are more pronounced, and more involvement of immigrants in entrepreneurial ventures may occur in the future (Nejašmić, 2014). There is no good discussion of minority entrepreneurship in Croatia, while it carries great potential to achieve positive social change. Minority entrepreneurship plays a vital role in the integration and employment of minority members of society (Tranfić, 2017). Šimić and associates emphasize numerous additional obstacles in the business environment for foreign entrepreneurs, such as the unavailability of information in English, slow issuance of OIB (known in Croatia as personal identification number), slow and insufficient transparent licensing, high amount of share capital for non-EU residents, duplication of procedures with different governmental bodies, closure of the general population and public policy makers towards foreigners, discrimination on various grounds and lengthy asylum procedures (Šimić et al., 2019). Čapo and Kelemen interviewed immigrants who moved to Zagreb and encountered obstacles, regardless of their education. Most of them from the middle social class see underdeveloped gastronomy as their opportunity for development and also see themselves in the development of tourism in the city of Zagreb. However, in addition to the benefits, they highlight many difficulties, including the absence of migrant policies, high taxes, and insufficient legislation. In addition to these problems, the City Administration encounters the problem that does not mention immigrants in the development strategy until 2020, and is not recognized as a development factor (Čapo, Kelemen, 2017). Brzzowski et al. conducted the survey and highlighted the lack of institutional support for immigrants in the Republic of Croatia and that immigrants are a small number, so they are still not joining informal communities through which they could operate. They also recognized the need to support the entrepreneurial initiatives of third-country migrants with more significant restrictions on starting a business than immigrants from EU member states (Brzzowski et al., 2021). Some examples of migrant entrepreneurs living and working in Croatia are Farah Khalil and Okoli Kikelomo. Farah Khalil moved to Zagreb in 2016th and opened a restaurant where she cooks Lebanese dishes. Nigerian Okoli Kikelomo opened a restaurant seven years ago, where she cooks Nigerian meals and distributes free meals to the poor. (<https://www.rtl.hr/vijesti-hr/novosti/hrvatska/3559259/njima-se-svidja-hrvatska-a-nama-njihova-hrana-u-centru-zagreba-okusite-momo-borsc-varenke/>). A Thai restaurant was opened in Zagreb by Saralee Madnui, who moved from Thailand to Croatia in 2015th. (<https://super1.telegram.hr/relax/u-centru-zagreba-otvorio-se-prvi-tajlandski-street-food-lokal-bili-smo-tamo/>). Brian Senaratne, who has worked at Microsoft for 13 years and was named Manager of the Year in Sri Lanka, together with his brother, has opened a restaurant in Zagreb offering dishes from Sri Lanka (<https://www.vecernji.hr/zagreb/vise-mu-se-nije-radilo-u-microsoftu-otisao-je-u-zagreb-i-otvorio-srilankanski-restoran-1053214>). In addition to those mentioned above, some of the foreigners who launched jobs in Croatia are Adriana Lukić. She owns Domus language, Hajnalka Lukacs Puklavec, the owner of the company Livicon and Simon Ferjuc owner of the Tetida Company, for EU funds. (<https://www.varazdinske-vijesti.hr/gospodarstvo/ima-i-toga-stranci-stranci-dolaze-u-hrvatsku-i-ovdje-uspjesno-posluju-doznajte-kako-10687/>) The first guests at Business Cafe for Foreigners were Paul Bradbury. He lived in Varaždin and owned the Total Croatia News portal, and Natalia Zielinska, a consultant for EU funds living in Ogulin. Both emphasize nepotism as a critical barrier to doing business in Croatia (<https://www.womeninadria.com/stranci-u-hrvatskoj/>). Taste of Home is a project of the Center for Peace Studies that has brought immigrants in the Republic of Croatia to present their culinary skills to citizens of the Republic of Croatia and to preserve the traditional dishes of the countries from which they come. In 2014, as part of the project, they published a book with recipes and stories about immigrants who participated in it. Taste of Home has grown into a company that employs immigrants that offers catering services, food production, cookbook publishing, and foreign language courses.

The company today brings together about 30 immigrants and volunteers, and the goal is to encourage the financial independence of immigrants by using their knowledge, skills, and previous experiences (Bužinkić, 2017). In 2019, CEPOR held a roundtable discussion on immigrant entrepreneurship involving some immigrant entrepreneurs who started businesses in the Republic of Croatia. Hermes Arriaga Sierra from Mexico (Impact Hub), Prince Wale Soniyiki from Nigeria (African Cuisine & Bar), and Mirela Rus from Romania (Break Time Nautical Bracelets) highlighted obstacles at the beginning, such as very high amounts of capital for EU non-residents, and compulsory hiring a minimum of 3 Croatian citizens. The only institution helping integrate immigrants is the Center for Peace Studies. Also highlighted are good practices from Spain, Finland, Germany, and the Netherlands. These countries carry out activities encouraging immigrants to engage in entrepreneurship. For example, Germany implements the Entrepreneurs Without Border initiative, which promotes self-employment, and is now a country where migrants employ 2.2 million people. The Netherlands has launched training for immigrants who want to engage in entrepreneurship, whose goals are the economic independence of immigrants through self-employment, empowerment through strengthening entrepreneurial skills and self-confidence, and removing prejudices relating to immigrants. This project is still in the pilot phase. Spain conducts workshops to simplify setting up businesses for immigrants. At the same time, Finland connects existing entrepreneurs with immigrants through mentoring programs to promote entrepreneurship and ensure that immigrant entrepreneurs receive information promptly ([www.cepor.hr](http://www.cepor.hr)).

### 3. DISCUSSION

According to the extensive literature review and analysis of migrant entrepreneurship, the author identifies and proposes three primary motives for migrant entrepreneurship.



*Figure 1: Three primary motives of migrant entrepreneurship  
 (Source: Author's creation)*

Figure 1 shows that the first motive is that migrants are often forced to leave their countries of origin for different reasons, where the dominant one being related to economic growth. Another motive is that migrants often do not find jobs appropriate for their occupations, face many cultural and financial obstacles, and consequently are forced to find their economic survival by starting their businesses. The third motive is the business development opportunities migrants recognize in foreign countries and therefore decide to start their businesses. They become carriers of new ideas offering new business concepts such as introducing new or modified products and services to the market based on their home origin, cultures, and skills. In this way, they bring new dimensions to the local market, such as opening restaurants offering specific dishes, producing art and craft, offering dance classes of their origin, and language schools. To integrate into the country's lifestyle, migrants also learn foreign languages and adapt to different lifestyle and other codes of conduct. However, at the same time, they exhibit their own cultural and social characteristics. These differences allow foreign entrepreneurs to achieve a successful entrepreneurial venture that represents novelties for the host countries contributing to the diversity of product offerings and the development of economics and GDP growth.

The research results indicate the importance of migrant entrepreneurship for the hosting economies and propose measures for the cooperative development of migrant Entrepreneurship in the Republic of Croatia.

#### 4. CONCLUSION

Migrant entrepreneurship is not a humanitarian action but an opportunity for new employment for both foreign nationals and locals, creating additional revenue in the state budget, transfer of knowledge and skills within the labor market, and enriching the infrastructural and tourist offer of the country of migration. In Croatia, migrant entrepreneurship is slowly growing but still not playing a significant role in the economy, while in the west, it is becoming an increasingly important economic factor. Therefore, it is necessary to raise awareness of the positive effects of migrant entrepreneurship, emphasizing an excellent opportunity to reduce unemployment. The most significant barrier that foreigners face is that the value of the share capital for developing a company founded by a foreigner from a third country must exceed HRK 100,000, thus reducing the possibility for unemployed foreigners to start their businesses. According to the literature review and other authors' findings, migrant entrepreneurs have weaker survival prospects than domestic entrepreneurs because they lack social capital and have difficulty accessing financial resources as institutions perceive them as risky clients. Croatian government needs to facilitate the development of migrant entrepreneurship to improve the country's economic diversity, in particular, the removal of administrative barriers and changes in people's perceptions of migrant entrepreneurship. Given that the number of migrants in Croatia is increasing every year due to the arrival of migrants to the European Union, further research should focus on the analysis of new migrants, countries of origin, employment, and the age of migrants. In addition to the above, the research should focus on the transfer of new knowledge from migrants to the local population and vice versa, and the analysis of the types of companies that migrants open, i.e., which sector they focus on, and innovation in starting a business. Given the current situation with the COVID-19 pandemic and war threat, it is necessary to monitor the development of migrant entrepreneurship and the sustainability of existing enterprises, as well as the support they receive from the government to survive in times of crisis.

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## **EMPIRICAL ANALYSIS OF THE IMPACT OF INFLATION ON THE INSURANCE PENETRATION OF NON-LIFE INSURANCE IN BULGARIA**

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### **ABSTRACT**

*This study examines the inflation impact on the penetration of non-life insurance in Bulgaria for the period 2007-2021. The results of the literature review show that inflation has an impact on insurance penetration, with the strength of this influence being different for individual countries and depends on the specifics of insurance market, economic development and financial culture of the population. The dynamics of the consumer price index in general and by groups according to the classification of individual consumption by purpose (COICOP/CPI) were tracked. Special attention is paid to the analysis of the price dynamics trend of motor insurance to property and casualty insurance. At the same time, the structure of household consumption was analysed, thereby highlighting the defining expenses in household budgets and their dependence on price dynamics. The modelling of the trend in the studied time series was performed using the method of least squares, and linear and non-linear functions were tested. Testing for trend in the dynamic series was performed using the first-order autocorrelation coefficient at risk of error 5% and the Box-Pierce (BP) and Box-Ljung (BL) test characteristics. In the present study, the standard insurance penetration indicator of non-life insurance and the individual indicators calculated on the basis of gross written premiums by key insurance classes are considered as the resulting (dependent) variable. The determination of the impact of inflation on the insurance penetration of non-life insurance in Bulgaria was carried out by means of regression and correlation analysis of time series for the period 2007-2021. Tests for the presence of correlation in the residual elements around the regression line are based on the Durbin-Watson coefficient (DW). The specificity of the Bulgarian non-life insurance market has been analysed on the basis of the private indicators of key insurances for the market. It is known that on the Bulgarian insurance market the largest share is compulsory Motor third party liability insurance, which is confirmed by the structure of household expenses and the higher rates of price growth than those prevailing in household*

*consumption groups according to the classification of individual consumption by purpose compared to motor insurance, as well as property and casualty insurance.*

**Keywords:** *inflation, non-life insurance, insurance penetration, gross written premiums, general insurance consumption, household consumption*

## 1. INTRODUCTION

Rising inflation is a nightmare that periodically disrupts the normal course of economies and wreaks havoc on economists' theories. It is accepted that inflation negatively affects the development of the insurance market, which requires predictability and stability. Inflation is usually understood as a general increase in the prices of goods and services or a decline in the purchasing power of money. According to the monetarist theory, inflation is a monetary phenomenon and the reason for its occurrence is the excessive money supply. When aggregate demand exceeds aggregate supply of goods and services, price pressure forms the so-called Demand-pull inflation. Increased consumer, business or government spending or an increase in net exports are possible reasons for this. As a result, the demand for goods and services will increase relative to their supply, providing an opportunity for firms to increase price margins. Cost-push inflation occurs when the total supply of goods and services in the economy falls. With reduced aggregate supply and unchanged aggregate demand, there is increased inflationary pressure (Baghestani & AbuAl-Foul, 2010). As Hildebrand points out, the supply-side inflation seen today is something new for the last 40 years. The post-pandemic inflation surge is not primarily being driven by excess demand, but by limits on supply capacity. We are in an era of severe supply constraints even though economies are below their potential (Hildebrand, 2022). The consumer price index (CPI) is the most commonly used indicator for measuring inflation rates, measuring the change in the prices of consumer goods and services included in the consumer basket of the average household. Among these goods and services are financial services and insurance, due to their importance for the consumption of the average household. The insurance sector is a provider of risk transfer/insurance coverage to the economy as well as an institutional investor. Through risk transfer, insurance companies protect business entities from all sectors of the real economy against loss of assets or income. In the conditions of reduced risk, companies can more calmly develop new projects, technologies and markets, which stimulates economic development. On the other hand, after the risk transfer, consumption is sustainable and growing, based on the value preservation. Life insurance companies are the largest institutional investor in economies with established insurance traditions. Non-life insurance, in turn, facilitates market mechanisms for selecting and financing profitable investment projects in its traditional role as a large institutional investor.

## 2. REVIEW OF THE LITERATURE SOURCES ON THE TOPIC

Inflation negatively affects both the life insurance and non-life insurance. Most often, the reason for this is the difficulty in predicting future results, the impossibility of adequately assessing technical reserves, the deteriorating outlook for the presentation of financial assets in insurance portfolios. Increased inflation affects the structure of the insurance market by increasing the share of compulsory insurance. Hakansson presented a multi-period model of rational purchase of insurance that allows inflation to be included as a factor without being explicitly introduced into the analysis (Hakansson, 1969), in contrast to a number of one-period and two-period models that do not allow the introduction of an inflation parameter (Richard, 1975), (Yaari, 1965). Babbel studied the impact of inflation on the sales of indexed life insurance policies in an attempt to mitigate the value erosion caused by inflation. Empirical evidence from Brazil proves that indexing policies does not solve the problem of inflation risk and insurance sales decline in periods of inflation (Babbel, 1981). Epetimehin and Fatoki analysed the insurance market in Nigeria and proved that the persistent high rate of inflation in the Nigerian economy

creates a serious problem to insurance growth (Epetimehin & Fatoki, 2011). Carlson and Parkin concluded that at high inflation rates, expected inflation can be seen as generated by a trial-and-error process in which the previous two errors are relevant, suggesting that expectations are formed by the rate of inflation and by the rate of its change (Carlson & Parkin, 1975). Inflation also has a serious impact on non-life insurance due to its long-term nature. Masterson measured the impact of inflation on insurers by isolating components of the CPI that relate to specific business lines (Masterson, 1968). Inflation associated with long-term liabilities is a major source of risk and can significantly affect the adequate valuation of technical provisions, thereby directly affecting future earnings (Ahlgrim & D'Arcy, 2012). Moreover, inflation risk, among other material risks, is calculated in Solvency Capital Requirements, which is also a corrective to insurance activity, due to the discouragement of investment in financial assets associated with the declining present value of expected benefits. The same study notes that macroeconomic impacts on insurers are rarely limited only to inflation. Combined with other variables, the complex impact can be multidirectional and nuanced. For instance, high inflation with its negative effect may be accompanied by low unemployment, which will positively affect insurance by improving sales, reducing some claims and possibly increasing the capital market and investment returns. D'Arcy et al describe the inflation-adjustment mechanism. It is assumed that the inflation observed in recent years will continue in the coming years until the claims are settled. In some cases, this can take decades. If inflation during this time period increases, expenses will be more than expected, which will affect long-term liabilities and will form losses (D'Arcy, Au, & Zhang, 2009).

### 3. USED METHODOLOGY

The review of publications related to the study of the impact of inflation on insurance, and in particular the relationship between inflation and insurance penetration in non-life insurance, shows that a variety of descriptive and analytical methods have been used. In the present study, the analytical possibilities provided by the available public data are used. The available information database of the Bulgarian statistics (National Statistical Institute – NSI) is used for the consumer price index (CPI) in general and by groups, according to the classification of individual consumption by goals, for the structure of the expenses of household budgets, as well as for GDP. The other database is that of the Bulgarian supervisory non-banking body, the Financial Supervision Commission, for the gross written premiums of non-life insurance, as well as for the gross written premiums of key insurance classes for the Bulgarian insurance market – Motor vehicle liability insurance, Land vehicles (other than railway rolling stock), Property damage insurance. The empirical focus of the paper is on the study of the relationship between inflation and insurance penetration of non-life insurance in Bulgaria for the period 2007-2021. In order to clarify some features of the Bulgarian insurance market and the consumption of insurance products, the structure of household consumption has been analysed, thereby highlighting the crucial costs in household budgets and their dependence on price dynamics. Modelling of the trend in the studied time series was performed using the method of least squares, and linear and non-linear functions were tested (Hamilton, 1994). Testing for trend in the time series was performed using the first-order autocorrelation coefficient ( $r_1$ ) at 5% risk of error and the Box-Pierce (BP) and Box-Ljung (BL) test characteristics (Maddala, 1992) (Dash, et al., 2018) (Webb & Pettigrew, 1999). The selection of the most suitable trend model was performed based on the competing models using the correlation coefficient ( $r$ ), the coefficient of determination ( $R^2$ ), the adjusted coefficient of determination ( $R_{adj}^2$ ) and Fisher's exact test (F) (Saikova, Stoykova-Kanalieva, A., & Saikova, S., 2002) (Slaveva, 2018). Research on the determinants and factor impact of financial services consumption can focus on a range of macroeconomic (Zahariev, et al., 2020a), fiscal (Pavlova-Banova, Mariyana, 2018), demographic, banking indicators (Zahariev, Angelov, & Zarkova, 2022) (Prodanov, Yaprakov,

& Zarkova, CAMEL Evaluation of the Banks in Bulgaria, 2022) in terms of methodology. For the purposes of the research and the experience to extract maximum analytical information on the given problem, the authors focus on the application of methods of analysing the dynamics and of studying factor influences. For example, an empirical analysis based on time series was performed to establish the prevalence of non-life insurance by examining the relationship between the insurance penetration ratio, the insurance density ratio, the gross written premiums of key insurance classes per capita as dependent variables and GDP per capita, average household income, savings, fixed assets (number of houses and cars), Gini coefficient, poverty line, interest rate and inflation as explanatory variables (Prodanov, Slaveva, Stanimirov, & Lyubenova, 2022). In the present study, the standard insurance penetration indicator of non-life insurance and the individual indicators calculated on the basis of gross written premiums by key insurance classes are considered as the resulting (dependent) variable. The determination of the impact of inflation on the insurance penetration of non-life insurance in Bulgaria was carried out by means of regression and correlation analysis of time series for the period 2007-2021 for general inflation and for inflation for housing-related insurance and for transport-related insurance. Through the Durbin-Watson ( $DW$ ) coefficient, tests for the presence of correlation in the residual elements around the regression line were performed (Granger & Newbold, 1974). For the Bulgarian insurance market, the largest share has the compulsory insurance – "Motor third party liability", followed by "Land vehicles (other than railway rolling stock)", "Property damage". Due to this specificity of the Bulgarian insurance market for non-life insurance, the analysis of the impact of inflation on insurance penetration for non-life insurance is deepened and is also based on the indicators of the specified key insurances for the market. At the same time, the dynamics in the structure of household expenses were tracked, as an additional factor affecting the dynamics of the insurance penetration of non-life insurance indicator.

#### 4. EMPIRICAL ANALYSIS

For the Bulgarian non-life insurance market during the period 2007-2021, it is typical that the share of non-life insurance gross written premiums in the total gross written premiums is between 80% and 87%. The gross written premiums from non-life insurance during the period increased 2 times – from BGN 1 268.6 million in 2007 to BGN 2 651.28 million in 2021. The average annual growth of the gross written premiums from non-life insurance is BGN 987.64 million, with the average annual growth rate being 5.4%. In the structure of gross written premiums by classes of insurance, the largest relative share is the motor vehicle liability insurance, which accounts for about 45% in recent years, and its key role is determined by the mandatory nature of motor third party liability insurance. The second place in terms of the relative share of gross written premiums is occupied by insurance "Land vehicles (other than railway rolling stock)", which accounts for between 25-32%. During the analysed period, there were changes in the structure of gross written premiums by insurance classes, the intensity of which was determined by the integral coefficient of structural changes and differences ( $K_S$ ) calculated with a basic structure from 2007 and with a chain structure compared to the structure for the previous year.

*Figure following on the next page*

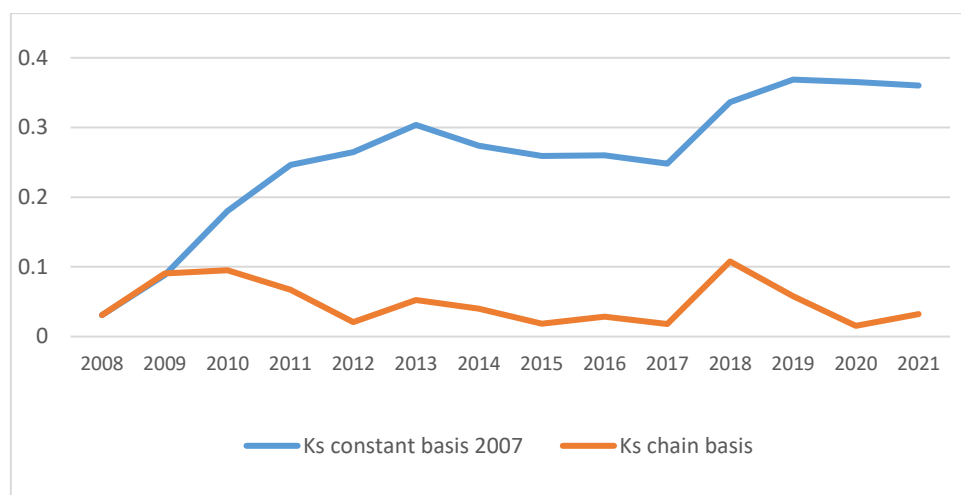


Figure 1: Dynamics of the integral coefficient of structural changes and differences  
 (Source: FSC and author's calculations)

Figure 1 clearly shows that compared to the basic structure from 2007, the biggest changes in the structure by types of insurance occurred in 2019 –  $K_S=0.3687$ , but there is also a significant change compared to the basic structure in 2020 ( $K_S=0.3653$ ), 2021 ( $K_S=0.3604$ ) and 2013 ( $K_S=0.3038$ ), with the general trend being for significant changes compared to the basic structure. The results of the analysis show that the more the base year is further back in time, the more pronounced the structural changes are, which is logical, since during the period there were changes in the macroeconomic environment, membership in the EU, interest in the offered insurance products gradually began to increase, the financial and insurance culture of the population improved, etc. The integral coefficient of structural changes with a chain basis shows that the largest changes in the structure of insurance classes occur in 2018 compared to 2017 – the coefficient is 0.10796, as well as in 2010 compared to 2009, when  $K_S=0.0954$  and in 2009 compared to 2008 –  $K_S=0.0908$ . For the period 2007-2021, the biggest changes in the structure compared to the structure of the previous year occurred in the period 2007-2010 and they are related to EU membership, changes in the environment and the impact of the economic crisis, and in 2018 compared to 2017, due to market turmoil as a result of the revoked license of an insurance company and the subsequent processes and effects on the market. In general, the structure by insurance classes in the Bulgarian market is relatively stable, but at the same time it is sensitive to changes in the macroeconomic environment – economic growth, inflation, employment, unemployment, income and consumption of the population, etc. This statement is also proven during the COVID-19 pandemic, when a decrease in the share of non-compulsory insurance is registered, and this is a logical result – increased uncertainty about the functioning of most economic activities, a decrease in disposable income, inflation, increasing unemployment etc. Of the key insurance products for the Bulgarian non-life insurance market, there is an increasing trend in motor third party liability premiums and land vehicles (other than railway rolling stock) premiums, but there is a decreasing trend for the property damage premiums. From the hypothesis testing for presence of a trend in the time series, it was found that the first-order autocorrelation coefficient and the Box-Pierce (BP) and Box-Ljung (BL) test characteristics were statistically significant (Table 1) and a trend existed for: Non-Life Insurance gross written premiums; Motor vehicle liability insurance gross written premiums; Land vehicles (other than railway rolling stock) insurance gross written premiums; Property damage insurance gross written premiums. The theoretical values of the autocorrelation coefficient at a significance level of 0.05 are in the range -0.462 with 0.328, and since BP and BL follow a chi-squared distribution, their theoretical value at a 5% risk of error is 3.84.

Indicators	$r_I$	BP	BL
Non-Life Insurance gross written premiums	0.9561	14.3421	17.4154
Motor vehicle liability insurance gross written premiums	0.9579	14.3685	17.4475
Land vehicles (other than railway rolling stock) insurance gross written premiums	0.8067	12.1006	14.6935
Property damage insurance gross written premiums	0.9434	14.1512	17.1836
Non-Life Insurance penetration ratio	0.9667	14.4004	17.0213
Motor vehicle liability insurance penetration ratio	0.8672	13.0081	15.7956
Land vehicles (other than railway rolling stock) insurance penetration ratio	0.9055	13.5821	16.4926
Property damage insurance penetration ratio	0.9659	14.4884	17.5930
Inflation	0.5598	8.3975	5.7085
Inflation in terms of Insurance connected with transport	0.2180	3.2699	3.9706
Inflation in terms of Insurance connected with the dwelling	0.2725	4.0875	4.9633

*Table 1. Tests for presence of a trend  
 (Source: NSI, FSC and author's calculations)*

After testing six types of models – linear, parabola, cubic function, logarithmic, power and exponential functions, it was found that the most suitable for describing the trend in the change of Non-Life Insurance gross written premiums, Motor vehicle liability insurance gross written premiums, Land vehicles (other than railway rolling stock) insurance gross written premiums is the parabola model, and for Property damage insurance gross written premiums is the cubic function, since the highest values of the F-criterion were obtained for them and the parameters of the models were statistically significant –  $P\text{-value} < 0.05$  (Table 2).

Indicators	Trend models	$r$	$R^2$	$R^2_{adj}$	$F$	$P\text{-value}$
Non-Life Insurance gross written premiums	$y = 1559.298 - 105.551t + 12.0943t^2$	0.977	0.954	0.946	123.08	<0.05
Motor vehicle liability insurance gross written premiums	$y = 396.224 - 9.312t + 4.124t^2$	0.966	0.934	0.923	84.899	<0.05
Land vehicles (other than railway rolling stock) insurance gross written premiums	$y = 702.784 - 68.36t + 4.762t^2$	0.871	0.759	0.719	18.928	<0.05
Property damage insurance gross written premiums	$y = 47.53 + 10.537t - 1.97t^2 + 0.077t^3$	0.976	0.952	0.939	72.937	<0.05
Non-Life Insurance penetration ratio	$y = 2.216 - 0.13t + 0.082t^2$	0.870	0.757	0.716	18.637	<0.05
Motor vehicle liability insurance penetration ratio	$y = 0.531 - 0.0095t + 0.001t^2$	0.899	0.808	0.776	25.197	<0.05 >0.05 >0.05
Land vehicles (other than railway rolling stock) insurance penetration ratio	$y = 1.025 - 0.103t + 0.005t^2$	0.915	0.837	0.810	30.911	<0.05
Property damage insurance penetration ratio	$y = 0.1017 - 0.0062t$	0.971	0.942	0.937	210.42	<0.05
Inflation	$y = 12.11 - 2.498t + 0.131t^2$	0.826	0.682	0.629	12.866	<0.05

*Table 2: Characteristics of trend models  
 (Source: NSI, FSC and author's calculations)*

The purpose of the paper is not only to establish and model the trends in the studied, but also to analyse the dynamics of the summarising indicator "insurance penetration" of non-life insurance and of the key insurances for the Bulgarian insurance market and to assess the impact of inflation on them.

Hypothesis testing for presence of a trend shows that a trend exists for insurance penetration ratio of non-life insurance, insurance penetration ratio of motor vehicle liability insurance, insurance penetration ratio of land vehicles (other than railway rolling stock), which is best described by a parabola model, and for insurance penetration ratio of property damage insurance – the linear model is most suitable. It is characteristic of the constructed parabolic models that the parameter characterising the speed of changes in the time series has a negative sign, i.e. negative rate of changes, and with a positive sign in front of the parameter characterising the acceleration of changes. In this case, it means that the parabola is convex at the bottom or there is a slow decrease until it reaches a minimum, after which it grows into an increase. Such a development is characteristic of most of the studied indicators, since during the studied period a decline was observed in the years of the global financial and economic crisis, and then a process of permanent growth began until 2021. It is known that inflation is defined as an increase in the general level of prices of goods and services, and high inflation rates are a sign of economic instability, a deteriorating macroeconomic environment and unfavourable economic situation. Inflation affects a number of economic and social indicators, as the difference between nominal and real incomes, between nominal and real interest rates, between nominal and real GDP, the purchasing power of the currency, etc. increases. The analysis of inflation dynamics in Bulgaria for the period 2007-2021 showed that from 2012 to 2020 annual inflation was between 0 and 4 in total and by groups according to the classification of individual consumption by goals, but during the pandemic of COVID-19 it began to increase, and this trend deepens in 2022 and reaches values that for some groups of goods significantly exceed the levels of 2009-2012. Special attention is also paid to the dynamics of inflation for insurance in connection with the dwelling and transport. Tests for presence of a trend showed that there was a trend for the change in headline inflation for the food, transport, housing, fuel and energy groups as well, but no such trend was found for insurances in connection with the dwelling and transport. In this regard, it is interesting to follow the dynamics of the total expenditure on average per household, which increased by about 3 times in 2021 compared to 2007. In the structure of household expenditure, the relative share of consumer expenditure in individual years is between 80% and 86%, and of non-consumer expenditure is between 14% and 20%. The group of consumer expenditure includes expenses for: food; alcoholic beverages and tobacco products; clothing and footwear; housing, water, electricity and fuels; furnishing and maintenance of the house; healthcare; transportation; messages; recreation, culture and education; various goods and services. The largest share in the structure of consumer expenditure in individual years is food spending, which accounts for between 40% and 58%, followed by housing, water, electricity and fuel spending with shares between 17% and 28%, transport spending have shares between 7% and 16%, for healthcare – between 6% and 12%, etc. This structure is preserved during the period, with the dynamics in the relative shares being minimal (the integral coefficient of structural changes is between 0.0212 and 0.0759), which is defined as relatively stable and is reasonably predicted to be preserved during the following years. Household demand for non-life insurance is highly dependent on average household income and expenditure structure. The impact of inflation on insurance penetration of non-life insurance is established through simple regression and correlation, and the characteristics of the selected models are presented in Figure 2. The influence of inflation on the insurance penetration of non-life insurance is significant – the correlation coefficient  $r=0.598$ . The coefficient of determination  $R^2=0.358$  shows that 35.8% of the variation in the insurance penetration indicator is explained by the variation in inflation. The regression coefficient shows that for a 1% increase in inflation, insurance penetration increases by 0.0277 percentage points.

Regarding the calculated individual indicators of the influence of inflation on the insurance penetration of the key for the Bulgarian insurance market insurance products, the following results were obtained:

- for motor vehicle liability insurance, the impact of inflation is also found to be significant  $r=0.51951$  and according to the coefficient of determination, 26.99% of the variation in the dependent variable is explained by the variation in inflation. The impact of inflation on insurance penetration for insurance connected with transport is weak – the correlation coefficient is 0.247 and the coefficient of determination is 0.0608, which means that only 6.08% of the variation in the dependent variable is explained by the action of the factor variable.
- for land vehicles (other than railway rolling stock) insurance, the impact of inflation is strong –  $r=0.8025$ , the coefficient of determination is 0.644, and the model parameters show that with a 1% increase in inflation, insurance penetration increases by 0.0341 percentage points. The net impact of inflation on insurance connected with transport is significant according to the correlation coefficient ( $r=0.5182$ ), and the regression coefficient shows that for a 1% increase in inflation in terms of insurances connected with transport, insurance penetration based on these insurances increases by 0.0057 percentage points. From the magnitude of the coefficient of determination ( $R^2 = 0.2686$ ) it is found that 26.86% of the variation of the dependent variable is due to the action of the factor variable.
- for property damage insurance, the impact of inflation on insurance penetration is moderately pronounced – the correlation coefficient is 0.4262, and the regression coefficient shows that a 1% increase in inflation corresponds to a change in the dependent variable of 0.0035 percentage points. The coefficient of determination is 0.1816 and shows that only 18.16% of the variation in insurance penetration for this insurance depends on the variation in inflation. The impact of inflation on insurance connected with the dwelling is also moderate ( $r=0.3177$ ), and according to the coefficient of determination, 10.09% of the variation in the insurance penetration of these insurances is due to changes in inflation on insurance connected with the dwelling.

The multiple regression model including the study of the impact of inflation and average household income on the insurance penetration of non-life insurance shows a strong dependence on the studied factors ( $r=0.7393$ ), with the impact of general inflation being much stronger than the inflation on insurances in connection with the dwelling and transport. It follows that the dynamics of the consumer price index by groups according to the classification of individual consumption by goals, especially those that form a significant share of household consumption, has a weaker impact on the consumption of insurance products. Therefore, the impact of general inflation on insurance penetration is more pronounced than the inflation on insurances in connection with the dwelling and transport.

*Figure following on the next page*



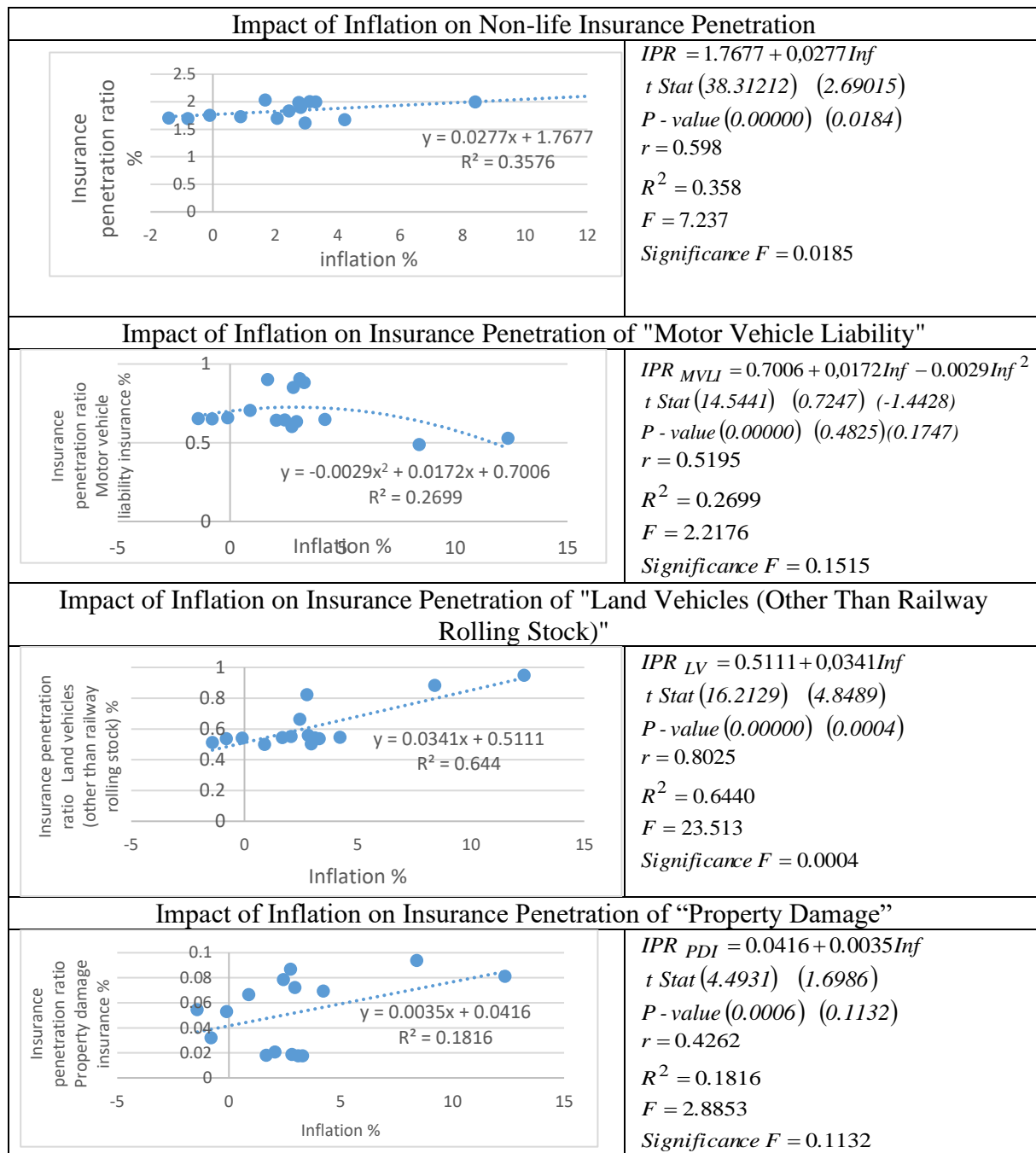


Figure 2: Correlational dependences of inflation and insurance penetration in general and by the main insurances  
 (Source: NSI, FSC and author's calculations)

## 5. CONCLUSION

The scope of the influence of inflation on economic processes is wide and complex. The analysis shows that in Bulgaria there are significant differences in the consumer price index (CPI) by groups of goods according to the classification of individual consumption by goals, with the highest growth traditionally marked by food products, fuels and energy, transport, healthcare, etc., while it is much slower expressed for the CPI for insurances in connection with the dwelling and transport. The demand for non-life insurance by households is highly dependent on the average income and cost structure of households, and rising prices and high inflation lead to a decrease in the purchasing power of households, to a restriction of

consumption and a decrease in the standard of living of the population, and this, in the medium term, may lead to limiting the demand for some classes of insurance that are not compulsory. The outpacing growth rate of the prices of other goods and services compared to the prices of insurances in connection with the dwelling and transport, on the one hand, is an indicator of significant competition on the Bulgarian non-life insurance market, but on the other hand, it forms an additional inflation risk to insurance companies, with a view to increasing the burden of claims and the indemnities paid. In this regard, the analysis of the impact of inflation on the summary indicator "insurance penetration" for non-life insurance and by the main classes of insurance proves that inflation has an adverse effect on both the consumers of insurance products in terms of their demand and their propensity to take out different insurances with voluntary nature, as well as regarding the stability of insurance companies. As a result of inflation, the risks for insurance companies increase, since it is possible that the real growth of insurance premiums lags behind the growth of the indemnities paid out, which leads both to the need for a refined assessment of technical reserves and to a reduction in the investment resources of insurance companies, and sometimes to the deterioration of their financial condition and solvency. The results obtained from the empirical analysis for Bulgaria confirm the conclusions of similar studies, but also reveal specific features of the Bulgarian insurance market in terms of the demand for insurance products, especially for those that are not compulsory and are not related to motor vehicles.

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## FORMING PRICES IN THE CORN, WHEAT AND SOYA PRODUCTION CHAINS IN THE POST-COVID CONDITIONS AND THE CONDITIONS OF THE UKRAINIAN CRISIS

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### ABSTRACT

*In the paper, an analysis of the costs and economic efficiency of the production of the three most significant stock-exchange crops in Serbia (namely corn, wheat and soya) was carried out. The paper is aimed at comparing the costs and profits their production in the year that was stable when the market is concerned (2018) and in the year which is affected by the influence of the coronavirus pandemic and the crisis in Ukraine (2022). The results have shown that there has been a significant increase in the growth of the total costs in all the three crops, namely 74.5%, 63.6% and 66.5% in corn, wheat and soybean, respectively. Change in the structure of the costs has also been perceived, namely the total production costs in the year 2022 were dominated by direct costs, i.e. the costs of the reproduction material, 65.3%, 55.8% and 55.1%, respectively. Changes in the agricultural products supply chain have caused a drastic rise in the kernel price per unit of measure namely by 73.7% in corn, 113.1% in wheat and 119.2% in the soybean kernel. Based on the analysis of the obtained parameters, the greatest economic efficiency was perceived in the production of soybean (1.43), then wheat (0.60) and corn (0.46).  
**Keywords:** Costs, Crisis, Food, Inputs, Price growth*

### 1. INTRODUCTION

The majority of developing countries depend to a great extent on agriculture and the import of agricultural products. The occurrence of the COVID-19 virus pandemic has significantly influenced both critical aspects in the agricultural products supply chain, those aspects being offer and demand. The Ukrainian crisis has additionally made the situation more difficult. The offer of and demand for food are directly connected with the food safety aspect, which is indicative of the fact that global food safety is exposed to risk (Sharma et al., 2020). A significant rise in the prices of a reproduction material, primarily mineral fertilizers, as well as the oil prices, has influenced the drastic increase in the total costs of the production of primary agricultural products. Ukraine ensures as much as 12% of the world's export of wheat, 16% of the world's export of corn and 46% of the world's production of sunflower oil. The situation that has developed in that country has disrupted the capability of Ukraine to produce and export its main crops, thus causing higher costs in production and also creating fear of the global shortage of food. There was an evident influence of the said on the price of food at the global level in a very short time. According to the report by FAO, the basic consumer basket in the month of March was by 60% greater in comparison with the same month in the previous year, which is the biggest rise having ever been recorded since the food price index started being monitored, to be more precise since 1990. In order to ensure the secure supply of the basic foodstuffs, the European Union is planning the growth of the production of the economically most important crops inside its borders. The areas under winter wheat and barley should expand by 1%, i.e. 20.7 and 4.8 million ha, respectively, to be more precise.

There are also expectations that the areas under rye (+5.5%) will also expand and the areas under hard wheat (4%) will shrink. In order to ensure the sufficient production of corn, there is a plan not to adhere to the fallow foresting rule any longer, which will ensure additional areas for this crop in spite of the growth of the input, primarily mineral fertilizers. Given the high prices of feed, the reduced production of meat, as well as reduced demand for food, is expected to be by around 1%. A reduction in the production of grains for biofuels is also expected at the level of 8%. Projections for food demand in the European Union territory even reach as far as 159.1 million tons. The agricultural sector of the Republic of Serbia succeeds in ensuring sufficient quantities of food although, however, agricultural producers are being faced with a great pressure on the budget because of the growth of the input prices. For that reason, many producers are incapable of establishing production in the planned volume which will allow them to be able to expect an appropriate profit. In order to establish the economic sustainability and profitability of a production line, it is necessary that all the costs generated in the production process, primarily those variable costs, where significant differences can be noticed year after year, should be monitored. The coverage of variable costs presented in the percentage of the total income indicates the profitability of a production and enables the comparison of different agricultural systems and cultures (Hadelan et al., 2015). This paper is aimed at carrying out an analysis of the economic efficiency of the production of the most significant stock-exchange crops in Serbia prior to the COVID pandemic and the Ukrainian crisis in comparison with the state of the matters in the year 2022.

## 2. MATERIAL AND METHOD

Most frequently, costs are classified into fixed and variable. In this research study, fixed costs are excluded, implying that land is owned by the estate and that no rent is paid. In that case, variable costs represent the total costs, so the gross margin becomes the same as a profit (Adamtey et al., 2016). The variable costs included seeds, fertilizers, soil enhancers and the services of agricultural mechanization with the engaged workforce. The prices of machine services are standardized according to the Machine Service Price List for the Year 2022 issued by the Cooperative Alliance of Vojvodina and the same is valid for Serbia as a whole, whereas the prices of the reproduction material were generated through market research. Bearing in mind the fact that the production year is ongoing and that there are tendencies that the prices of primary agricultural products will change the calculations for the year 2022 were made based upon the current prices of inputs and products with the same kernel yield as per unit of soil area in both years.

The analytical calculation based on variable costs was carried out by means of the following formula (Subić et al., 2019):

$$MP = D - VT, \text{ where } D = p \times c \quad (1)$$

where the analytical elements are presented as follows:

MP – the coverage margin;

D – the total profit;

VT – the variable costs;

p – the volume of production as per unit of measure;

c – the price of the product as per unit of measure.

Economic efficiency was calculated as follows:

$$\text{Economic efficiency} = \text{Coverage margin} / \text{Total costs} \quad (2)$$

### 3. RESULTS AND DISCUSSION

The total costs, the value of production and the financial result in agricultural production are determined by individual factors, primarily by the prices of the input(s) and the market price of a product (Winnicki and Żuk-Gołaszewska, 2017). The costs of the production of corn, wheat and soybean, and the value of the obtained products, are shown in the tables 1 to 3. All the relevant indicators were taken into account in the calculations. The analysis of the total costs and their structure indicates significant market changes between 2018 and 2022. The total costs of the production of mercantile corn in the year 2022 are higher by 74.5% in comparison with the year 2018 (Table 1).

The specification of the costs of materials and operations		The amount	The unit of measure	The value in RSD	
				2018	2022
The direct costs – the costs of materials					
A	Seeds	2.73	s.u.	13,650	21,226
	NPK 16:16:16/ 8:20:30	500	kg	18,780	59,500
	UREA (46%N)	300	kg	11,670	30,600
	Protective agents	1.4+1.5 0.15+1	l	5,800	6,500
	I antiweed treatment (pre-em) Mont + Terbis				
	II antiweed treatment Skaut + Talisman				
Total				49,900	117,826
The indirect costs – the costs of machine operations with the costs of fuel					
B	Spreading mineral fertilizer before ploughing	1	ha	1,609	2,010
	The basic processing – ploughing up to 30 cm	1	ha	10,287	12,460
	Leveling ploughing – harrowing with heavyweight harrowing machine (over 4.5 m w.w.)	1	ha	4,599	5,000
	Spreading mineral fertilizer before ploughing	1	ha	1,609	2,150
	Pre-sowing preparation – germinator work	1	ha	4,752	5,500
	Sowing (pneumatic seeder)	1	ha	3,215	3,500
	Spraying 2 x (the price of one single spraying multiplied by 2 treatments)	1	ha	6,177	7,160
	Inter-row cultivation	1	ha	2,052	1,950
	Combining corn kernels by a chopper	1	ha	13,398	14,530
	The transportation of mineral fertilizer, seeds and water for the spraying equipment			3,853	6,120
	Transportation by an 8-t double-axle trailer	1	hour	1,964	2,230
	Total				53,514
Total costs (A+B)			RSD ha <sup>-1</sup>	103,414	180,436
1	Yield	8,000.00	kg ha <sup>-1</sup>		
2	The kernel price		kg	19	33*
3	Total profit		RSD ha <sup>-1</sup>	152,000	264,000
4	The coverage margin		RSD ha <sup>-1</sup>	48,586	83,564
* Commodity Exchange Novi Sad, May 2022					

\* Commodity Exchange Novi Sad, May 2022

Table 1: The analytical calculation of the production of mercantile corn in the years 2018 and 2022

In the year preceding the market crisis caused first by the occurrence of the Coronavirus, then the war raging in Ukraine, the costs of the materials and machine services had almost evenly been present (48%:52%, respectively). In 2022, however, there was a strong rise in the prices of the reproduction material that now accounts for 65% of the total production costs.

A drastic change like this in the cost structure was primarily provoked by the rise in the prices of mineral fertilizers, with the price of the NPK fertilizer recording a rise by 216.8%, and that of UREA by 162.2%. The seed material recorded an increase of 55%, whereas the costs of crops protection increased by 12.1%. On the other hand, the rise in the prices of machine services was primarily caused by the rise in the prices of oil and oil derivatives, with the total amount of these costs simultaneously being bigger by 17% in the year 2022 in comparison with the year 2018. The reduced volume of the production of the main agricultural crops in Ukraine and the exports cessation have led to a shock in the stock-exchange crops market. The growth of demand for food products both raw and processed has had an influence on the drastic rise in the price of corn that is higher by 73.7% in the year 2022 in comparison with the year 2018. Although production is significantly burdened by direct costs in 2022, the high prices of agricultural products and food have enabled the growth of gross income by 74% and the coverage margin by 73% in comparison with 2018, so it can be concluded that growing corn is still lucrative for agricultural producers (Table 1). Wheat (*Triticum aestivum* L.) is one of the most significant grown species and the basic food for more than 50% of the global population (Dolijanović et al., 2019). In developed and developing countries, the average consumption of wheat as per capita is 95 kg, or 61 kg (FAO, 2016). In Serbia, the average consumption of wheat as per capita is 180 kg, which is considerably more than the consumption rate in the majority of the European countries (USDA, 2017). Because of that, the production and price of the bread-making grain is very important not only at the national level, but also at the global level. Based on the data accounted for in Table 2, it can be noticed that even in the production of wheat, there has been a significant growth of total costs, the price of the kernel and the generated income as per unit of soil area. The total costs of wheat production in 2022 are greater by 63.6% in comparison with 2018. Besides, a change in the relationship between direct and indirect costs is also noticeable. Namely, in 2018, the indirect costs accounted for over 59.5% and the direct costs were around 40.5% of the total costs of production. In 2022, that relationship has changed in favor of the direct costs, i.e. the costs of materials, which now account for 55.8% of the total costs of production. The costs of the purchase of mineral fertilizers make up 35.4% of the total costs of wheat production. On the other hand, the price of the machine services in the period under observation have increased by 21%, which is a consequence of the growth of the price of all energy-generating products, even oil itself, in the global market. Although the costs of production have significantly increased in comparison with the year 2018, the growth of the price of wheat by 113% has ensured income greater by 113% and the coverage margin greater by 333% in 2022.

*Table following on the next page*

The specification of the costs of materials and operations		The amount	The unit of measure	The value in RSD	
				2018	2022
The direct costs – the costs of materials					
A	Seeds	225	kg	12,150	13,500
	NPK 16:16:16/ 8:20:30	300	kg	7,512	35,700
	SAN, AN	170	kg	3,930	18,190
	Protective agents Antiweed treatment – Lancelot 450 WG I fungicide treatment (the wheat intensive growth phase) – Falcon EC460 II fungicide treatment (of the flag leaf) – Amistar Extra III fungicide treatment (of the flowering)+the anti-insect treatment – Prosaro 250EC + Fastac	0.033 0.60 0.70 1+0.2	l, kg	14,100	17,600
	Total			37,692	84,919
	The indirect costs – the costs of machine operations with the costs of fuel				
	B	Spreading mineral fertilizer before ploughing	1	ha	1,609
The basic processing – ploughing up to 20 cm		1	ha	6,349	9,600
Pre-sowing preparation – the work of a germinator of over 4 m		1	ha	5,834	6,690
Sowing (pne.sej)		1	ha	3,155	3,740
Spreading mineral fertilizer – additional supplementation in the spring 2x		1	ha	3,217	2,750
Spraying 3 x (the price of one single spraying multiplied by 3 treatments)		1	ha	9,386	10,740
Harvest		1	ha	11,504	13,330
The transportation of mineral fertilizer, seeds and water for the spraying equipment				4,340	5,919
Transportation by an 8-t double-axle trailer		1	hour	1,965	2,230
Straw baling		rolled bales up to 250 kg		9,120	10,200
Total				55,347	67,209
Total costs (A+B)			RSD ha <sup>-1</sup>	93,039	152,199
1	Yield	6,000.00	kg ha <sup>-1</sup>		
2	The kernel price		kg	19	40.5*
3	Total profit		RSD ha <sup>-1</sup>	114,000	243,000
4	The coverage margin		RSD ha <sup>-1</sup>	20,961	90,801
* Commodity Exchange Novi Sad, May 2022					

*Table 2: The analytical calculation of wheat production in the years 2018 and 2022*

In soybean production, the total costs record a 64.7% growth in the period under observation. In the prior period, the costs of materials accounted for around 35%, and the mechanization costs accounted for around 65% of the total production costs. Due to the fluctuations in the market, there has been an increase in the share of the direct costs that are 55% in 2022, whereas the costs of the mechanization participate with 45% in the total costs of production. The costs of machine operations are greater by around 14%, which is the consequence of the growth of the prices of energy-generating products, oil in the first place. The growth of demand of the soya kernel at the global level has also influenced the fixing of the price of this crop on the domestic commodity exchange. The price of soybean on the domestic commodity exchange records a growth of 119% in comparison with the year 2018.



The formed kernel price exerts an influence on the gross income as per unit of measure, so the expected linear growth of gross income is around 119%. The coverage margin with the mentioned kernel yield of 4,500 kg ha<sup>-1</sup> would be almost three times as big in the current circumstances in relation to the year 2018 (Table 3).

The specification of the costs of materials and operations		The amount	The unit of measure	The value in RSD	
				2018	2022
The direct costs – the costs of materials					
A	Seeds	90	kg	8,730	14,400
	NPK 16:16:16/ 8:20:30	300	kg	7,512	35,700
	SAN, AN	170	kg	3,468	17,850
	Protective agents pre-em Velton WG + Basar, post-em Corum+Dash, sorghum Floyd	0.45 +1.4 0.9+0.5 1.3	kg/l	10,800	13,500
	Total			30,510	81,450
The indirect costs – the costs of machine operations with the costs of fuel					
B	Spreading mineral fertilizer before ploughing	1	ha	1,609	2,010
	The basic processing – ploughing up to 30 cm	1	ha	10,287	12460
	Leveling ploughing – harrowing with heavyweight harrowing machine (over 4.5 m w.w.)			4,599	5,000
	Pre-sowing preparation – the work of a germinator of over 4 m	1	ha	5,834	6,690
	Sowing (pneumatic seeder)	1	ha	3,285	3,510
	Spreading mineral fertilizer – additional supplementation	1	ha	1,609	2,150
	Spraying 3 x (the price of one single spraying multiplied by 3 treatments)	1	ha	9,386	10,740
	Inter-row cultivation			2,315	2,640
	Harvest	1	ha	12,135	13,130
	Transportation by an 8-t double-axle trailer	1	hour	1,965	2,030
	The transportation of mineral fertilizer, seeds and water for the spraying equipment			5,300	6,090
	Total			58,322	66,450
Total costs (A+B)			RSD ha <sup>-1</sup>	88,832	147,900
1	Yield	4,500	kg ha <sup>-1</sup>		
2	Kernel price	1	kg	36.5	80.0*
3	Total profit		RSD ha <sup>-1</sup>	164,250	360,000
4	The coverage margin		RSD ha <sup>-1</sup>	75,418	212,100
* Commodity Exchange Novi Sad, May 2022					

\* Commodity Exchange Novi Sad, May 2022

Table 3: The analytical calculation of soybean production in the years 2018 and 2022

The indicators of the economic efficiency of the production of the selected crops in the year 2022 are shown in Table 4. Based upon the obtained results, it can be concluded that the best economic efficiency can be expected in the production of soybean although the production of this crop is burdened by the biggest costs as per unit of measure (RSD 32.9). The indicators of the economic efficiency of corn and wheat are considerably lesser than 1, which makes the production of these crops less cost-effective and less safe even though there has been a drastic increase in the kernel price.

The indicator	Crops		
	Corn	Wheat	Soybean
Total income, RSD ha <sup>-1</sup>	264,000	243,000	360,000
Total costs, RSD ha <sup>-1</sup>	180,436	152,190	147,900
Coverage margin, RSD ha <sup>-1</sup>	83,564	90,801	212,100
Costs as per unit of measure, RSD kg <sup>-1</sup>	22.6	25.4	32.9
Economic efficiency	0.46	0.60	1.43

Table 4: The indicators of the economic efficiency connected with the production of corn, wheat and soybean in the year 2022

#### 4. CONCLUSION

In the paper, an analysis of the economic efficiency of the production of corn, wheat and soybean was carried out so as to establish a fact of changes in the production chain before and after the crisis caused by the Coronavirus and the developments in Ukraine. The research results have revealed that in all three crops there has been a significant growth of the total costs at the level of 63.6% all the way to 74.5% in wheat, and corn, respectively. A change has also been noticed in the structure of the costs with the growth of the direct costs at the expense of reduction in the costs of machine operations. The changes in the agricultural product supply chain have created a drastic rise in the kernel price as per unit of measure, namely by 73.7% in corn, 113.1% in wheat, and 119.2% in the soya kernel. Based on the analysis of the obtained parameters, it was determined that the production of soybean demonstrated the biggest economic efficiency, only to be followed by the economic efficiency of wheat (0.60) and corn (0.46).

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## SIZE PREMIUM – CAN IRRATIONAL EFFECTS PROVIDE ADDITIONAL EXPLANATION?

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### ABSTRACT

*The size premium is a well-documented stock market anomaly since the 1980's. While some authors claim that this anomaly disappears if various factors are controlled for, there is also a vast body of research claiming that this anomaly is well and alive. The purpose of this thesis is to explore the relationship between irrational factors and the size premium. The irrational factors considered are seasonal affective disorder and the well-known Monday effect. We use US data for 1926-2020 that are combined using size as well as book-to-market decile portfolios 10×10. The results partially suggest that the cold season and the Monday effect have a significant effect on the size premium. This effect appears to depend on the type of the company. Inside each book-to-market decile, the SAD variable had smaller absolute coefficients for relatively smaller size companies. The effect FALL variable was close to negligible for smaller companies, across each book-to-market decile. The Monday effect was also associated with coefficients closer to zero (all the coefficients were negative) for growth companies than for value companies. The impact of TAX was significant among larger companies, and for small value stocks, the impact was greater than small growth stocks. However, one may find evidence of the size premium anomaly even after accounting for the irrational factors. We discuss possible explanations and suggest further research approaches.*

*Highlights:*

- *We track the performance of 100 portfolios ranked according to size and book-market ratio*
- *Tax effect is prominent among large firms and those with high B/M ratios*
- *Monday is prominent among small and high B/M firms*

**Keywords:** *Anomaly, Premium, Tax*

### 1. INTRODUCTION

Numerous papers from the early 1980's claim that investing in small firms yield higher premiums than investing in larger firms. This phenomenon has been studied in the U.S. market as well as in other capital markets, and various assessments of its magnitude and characteristics were addressed in the literature. Despite the well-documented size-based findings, this market anomaly has always been related to corporate fundamentals and macro-financial variables. Indeed, many studies claim that this market anomaly compensates for the risk that originates in lower liquidity or illiquidity (DeMoor and Sercu, 2013), higher default risk (e.g., Andrikopoulos et al., 2008) and higher systematic risk of these firms (Wang, 2000). Amihud (2002) proposes a measure of based on the average daily ratio of absolute stock return to dollar volume across stocks. He showed that illiquidity affects more strongly small firm stocks, thus explaining time series variations in their premiums over time. Ibbotson et al. (2013) examined American stocks from 1972 to 2009 and found that the liquidity effect does not fully explain the size effect. However, firm size and liquidity are highly correlated. Kim and Qi (2010) considered another measure, accrual quality, to predict the cost of firms' equity capitals.

They reported that the cost of equity is associated with fundamental risk. Hur et al. (2014) state that the size premium is explained by distress risk only during periods of up market, whereas the relationship between firm size and returns holds during periods of down markets. Their results are robust to different definitions of up and down markets using credit spreads and various estimations of beta. Their findings therefore suggest that the size effect may depend on idiosyncratic risk or it might be associated with behavioral factors, and not on systematic risk. These results are in contrast to those of Fama and French (1993) who claimed that systematic risk explains the size premium. Despite the growing attention to this anomaly in the literature, it seems that the literature has overlooked the role of mood in explaining the size effect. Thus, the need for empirical analyses became crucial, particularly for establishing the validity of irrational factors in explaining the size effect. The current research is an effort to bridge this gap by studying two drivers that reflect the association with variations in mood proposed in the psychology literature. The first driver is Monday, often described in the psychology literature as the worst day in the week (Areni et al., 2011), and the second driver is the seasonal affective disorder (SAD)-recurrent depressions which occur annually at the same time (Rosenthal et al., 1984; Dolvin et al., 2009). In the present research, we investigate comprehensively the contribution of mood fluctuations associated with these factors to the size effect. We utilize U.S. daily data over the last 94 years (July 1926 to June 2020). Finally, as mood of investors is not directly evaluated, we utilize the Twitter Happiness Index. The literature suggests the latter to proxy people's mood (Bollen et al., 2011).

## **2. LITERATURE REVIEW**

### **2.1. Size effect**

Banz (1981) was the first to document the size effect using U.S. firms ranked by deciles from 1926 to 1980. His main finding indicates that risk-adjusted stock returns are a decreasing function of firm size. Stocks of large companies have lower returns than those of small companies. In line with Banz (1981), Reinganum (1981) estimated a monthly premium (excess return) of 1.77% for the SMB (small minus big) deciles. Similarly, Keim (1983) conducted a study of 10 portfolios between 1963 and 1979 ranked on the basis of size and reported a monthly premium of 2.5%. He also noted that the premium was more pronounced in January than in any other month. Berges et al. (1984) examined monthly returns for 391 Canadian stocks from 1950 to 1980. They divided the sample firms into five portfolios ranked by their market value. They documented higher returns in January, particularly for small firms. Fama and French (1993) reported a size premium of 0.63% resulting from the difference between the average return of the smallest and the largest size portfolio. Soon after the first documentation of the size effect, a body of research has depicted a contradictory picture of the size effect. Some authors have demonstrated opposite results, inconsistencies, or lack of adequate support for the size effect anomaly. A study by Brown et al. (1983) examined the behavior of the size effect over time. Using data from 1967 to 1979, they found the risk-adjusted average returns of portfolios are linearly related to size. Handa et al. (1989) used a sample covering 1941-1982 and found the size effect is sensitive to the return measurement interval, as it becomes statistically insignificant when risk is assessed with betas measured using annual returns. Pettengill et al. (2002) argue that the size effect depends on market momentum; it varies in bull and bear markets. Additional studies (Eleswarapu and Reinganum, 1993; Dichev, 1998; Chan et al., 2000; Horowitz et al., 2000; Amihud, 2002) contend that the size effect no longer exists, while others point to the beginning of the 1980s as the turning point at which the size effect vanished (Hirshleifer, 2001; Schwert, 2003). Finally, Goldie (2014) argues that the size effect does not exist anymore. In his study of takeovers, he tests the impact of takeover activity on size and concludes that after controlling for takeovers, the size effect fell by over 40%.

Although this anomaly was under fire in many studies, recent studies still support the existence of the size effect in emerging as well as in developing markets. For example, Sehgal et al. (2012) tested for the existence of the size effect anomaly in the Indian market in addition to other various anomalies (value, momentum, liquidity, accruals, profitability and net stock), and found that the size effect is the most prominent anomaly with a monthly premium of 4.4% for small firms. Fama and French (2012) argue that other than the Japanese market (North America, Europe and Asia Pacific) a value premium exists in average stock returns and decreases with size. In another international study, DeMoor and Sercu (2013) concentrate on the years after the 1980s when presumably the size effect disappeared but failed to find a potential explanation for the broad effect. They try to relate the anomaly to market risk, infrequent trading, risk of financial distress, missing book values, momentum, liquidity risk, changing business conditions, the January effect, exchange risk, time-varying risk loadings and dividend yield effects. Sehgal et al. (2014) provide support for the size anomaly in emerging markets such as India, South Korea, and Brazil. Hur et al. (2014) establish a significant relationship between size and returns in bear market conditions only. However, they do find a consistent size effect in any given market condition, but this effect is limited to January alone. Hilliard and Zhang (2015) document the clear existence of the size effect in the Chinese stock market. They also report that the effect was stronger when China adopted a restrictive monetary policy. Alhenawi (2015) tests the relationship between momentum and size, and finds that the size effect fades during strong up markets, allowing momentum to drive stock prices, and that the momentum effect is more evident across large rather than small size firms. Pandey and Sigal (2016) examine the size effect in the Indian stock market between 2003 and 2015. They confirm that the anomaly does exist and that it is more pronounced when they control for penny stocks. Their results are robust to different measures for size (which is generally proxied by market capitalization) such as total assets, net fixed assets, and enterprise value. Copeland and Copeland (2016) maintain that the size effect exists but only for negative changes in the fear (VIX) index (i.e., market indices rise). They suggest that the benefit of owning a small-cap stock depends on the distribution of the change in the VIX in any given period rather than on size alone. Finally, the vanishing or the absence of the size effect claim has been challenged by recent studies. For example, Gandhi and Lustig (2015) found evidence of the size effect in U.S. bank shares. Asness et al. (2018) provide a corrected and robust measure for the size-effect and show that it is present in 30 different industries and in 24 international equity markets. Hou and Van Dijk (2019) suggest adjusting the prices of stocks for profitability shocks, thereby exposing the size effect. Given the mixed evidence about the size effect anomaly, the aim of this study is to re-examine this issue using data that are more recent and to detect the possible role of irrational factors in explaining even partially the existence of this effect.

## **2.2. Seasonal Affective Disorder**

Seasonal affective disorder (SAD) is a syndrome characterized by recurrent depressions that occur annually at the same time each year (Rosenthal et al., 1984; Dolvin et al., 2009). SAD had been shown to produce heightened pessimism and risk aversion during the fall and winter months. Research has shown that stock analysts exhibit both optimistic and pessimistic biases in their earnings forecasts, and subsequent works linked SAD and stock market analysts' estimates (Dolvin et al., 2009). These results suggest that analysts are generally optimistic in their forecasts but significantly less so during SAD months. They also find this relation is more pronounced for analysts located in northern US states, who should be the ones most impacted by SAD. Dowling and Lucey (2008) showed that SAD was the most robust of seven mood proxies, and best explains variations in equity returns and variance. Further evidence of this effect of SAD was provided by Kliger and Kudryatsev (2014) who reported augmentation of stock price reactions to recommendation downgrades during periods of high SAD.

Recently, Hirshleifer et al. (2020) developed a model with “mood-betas” for individual stocks and showed that high “mood-beta” stocks are more affected by aggregate mood. Another well-known psychological effect stems from the day-of-week, with Monday bearing some of the strongest effects.

### 2.3. Monday Effect

Substantial evidence for mood fluctuations across weekdays is reported in psychology literature. The most consistent finding is the “Monday effect” which has been documented by numerous authors (for example, Cross, 1973; Chiah and Zhong, 2019). Many authors attempt to explain the Monday effect using the mood channel. Pettengill (1993) conducted an investment-simulation experiment, where investors divide their wealth among seven securities, over a few investment rounds. Paired portfolio choices on Monday and Friday were compared for similar investors, and the results were consistent with the so-called “Blue Monday” hypothesis: participants invested lower proportions of their wealth in securities with the highest risks on Mondays. Gondhalekar and Mehdian (2003) examined NASDAQ stock returns and demonstrated that the Monday pattern in stock returns is positively correlated within different industries and that for many industries the Monday effect is related to proxies for pessimism among investors, such as changes in the discounts and returns of small stocks. Abu Bakar et al. (2014) examined its relationship with mood. They used Facebook mood data from countries across the world and showed that when controlling for mood the Monday effect disappears. Ülkü (2017) found that asset-pricing factors are strongly affected by the Monday effect. He showed that the Fama-French's RMW profitability factor captures the value in the miss pricings created by the Monday effect. This section attempted to provide a brief literature review relating to the marginal effects of SAD and Monday and size premium in stock market returns, and whether these effects exist. Overall, there seems to be some evidence in favor of these effects. However, previous studies have not considered these irrational factors as possible explanations for the size premium. In this study, we aim at rectifying this gap. The following section describes the procedures and methods of this study.

### 3. METHOD

To assess the effects of the irrational factors (SAD, fall, Monday, taxation) on the daily returns, a time-series regression model (AR(p)) had been fitted to the data:

$$R_{i,t} = \alpha_0 + \alpha_{SAD}SAD_t + \alpha_{FALL}FALL_t + \alpha_{MON}MON_t + \alpha_{TAX}TAX_t + \sum_{j=1}^p d_j R_{i,t-j} + u_{i,t} \quad (1)$$

where  $R_{i,t}$  is the daily returns for decile  $i$ ;  $\alpha_0$  is an intercept; and  $SAD_t$  is defined by Equation (2):

$$SAD_t = \begin{cases} H_t - 12 & \text{for trading days in the fall and winter} \\ 0 & \text{Otherwise} \end{cases} \quad (2)$$

$H_t$  denotes the amount of time between sunset and sunrise, and  $(H_t - 12)$  denotes the length of the night relative to the annual average length of the night.  $FALL_t$  is an interactive dummy variable that receives “ $SAD_t$ ” for days of the year in the fall season (September 21 to December 20 in the northern hemisphere), and zero otherwise.  $MON_t$  is a dummy variable that receives the value of 1 on Mondays (or the first trading day following a long weekend) and 0 otherwise.  $TAX_t$  is a tax-loss selling dummy variable that takes the value of 1 for the day prior to and the four days following the start of a tax year and 0 otherwise. To control for autocorrelation in  $u_{i,t}$ , we include lag values of the dependent variable  $\sum_{j=1}^p c_j R_{i,t-j}$ .

#### 4. DATA

The sample consists of the daily rates of return of portfolios constructed from U.S. stocks traded on the NYSE, AMEX, and NASDAQ. The data come from Kenneth French's website and cover the period of July 1926 through June 2020. The website provides unique information about portfolios categorized according to several factors. For example, the database includes data on 10 decile portfolios that mirror the entire range of traded stocks sorted according to firm size. These portfolios are rebalanced once a year in June using the June NYSE market equity value as breakpoints. In addition, we extract the average return on the three small-cap portfolios minus the average return on the three large-cap portfolios, sometimes known as the Small-Minus-Big (SMB) portfolio. The SMB portfolio is generally used in the literature as a proxy for sensitivity to common risk factors in stock returns (e.g., Fama and French, 1993). More importantly, many prior works utilize this variable to capture the premium of the size effect (e.g., Ferson and Harvey, 1999; Zakamulin, 2013). Table 1 reports the descriptive statistics for the variables in utilized in this study. The sample mean, median, maximum, minimum, standard deviation, skewness, and kurtosis are given for the entire scope of the study.

*Table 1: Descriptive statistics of the variables*

**Panel A: Full Sample (01/07/1926-30/06/20)**

	<b>SMB</b>	<b>Daylight</b>	<b>H</b>	<b>TAX</b>	<b>SAD</b>	<b>FALL</b>
<b>Mean</b>	0.005	12.257	11.743	0.011	-0.763	0.384
<b>Med</b>	0.020	12.280	11.720	0.000	0.000	0.000
<b>Max</b>	8.210	15.231	14.750	1.000	1.640	2.750
<b>Min</b>	-11.62	9.250	8.770	0.000	-2.750	-1.180
<b>S.D</b>	0.586	1.999	1.999	0.103	1.007	0.809
<b>Skew</b>	-0.722	-0.031	0.030	9.457	-0.833	1.908
<b>Kurt</b>	25.711	1.567	1.566	90.429	2.450	5.077
<b>#Obs</b>	24768	24768	24768	24768	24768	24768

Notes: The table report the descriptive statistics of variables of the key variables used in the study. The variables are daily-based. Panel A addresses the entire sample period, while Panels B, C, D and E (See Appendix PAGE 31-32) address 6,192 observations each, from July 01, 1926 to June 30, 2020. For each variable, we report the mean, median, standard deviation, Skewness, Kurtosis and the number of observations.

The high values of kurtosis for SMB indicate heavy tailed distributions of these variables. The timespan of the current study is 94 years, and to verify the robustness of the proposed model, we split the data into four equal sequential periods, and considered them as well: July 1926-April 1947, May 1947 – May 1971, June 1971 – November 1995, December 1995 – June 2020. Descriptive statistics for these data are given in Appendix (Page 31-32).

#### 5. RESULTS

The aim of our research was to assess whether and to what extent irrational factors, namely SAD and Monday, influence the size effect premium, measured by returns of the SMB portfolio. The model resulting from the theory discussed above is:

$$R_{i,t} = \alpha_0 + \alpha_{SAD}SAD_t + \alpha_{FALL}FALL_t + \alpha_{MON}MON_t + \alpha_{TAX}TAX_t + \sum_{j=1}^p d_j R_{i,t-j} + u_{i,t} \quad (1)$$



where  $R_{i,t}$  is the daily returns for decile  $i$ ;  $\alpha_0$  is an intercept; and  $SAD_t$  is defined by Equation:

$$SAD_t = \begin{cases} H_t - 12 & \text{for trading days in the fall and winter} \\ 0 & \text{Otherwise} \end{cases} \quad (2)$$

### 5.1. Estimation Results of Equation (1)

We fit the regression model (1) with  $p = 1$  to account for autocorrelation. The model was fitted to the entire dataset of 94 years, as well as to each of the four subsets of the data. Table 2 presents the least squares parameter estimates as obtained from the E-views software package.

Table 2: least squares parameter estimates as obtained from the E-views software

	07/26 – 06/20	07/26-04/47	04/47 – 05/71	05/71 - 11/95	11/95 - 06/20
Intercept	0.0030 (0.530)	0.0000 (0.032)	-0.0030 (-0.594)	0.0120 (1.513)	0.0080 (0.728)
SAD	-0.026a (-5.298)	-0.0160 (-1.166)	-0.020a (-4.275)	-0.040a (-4.898)	-0.017c (-1.647)
FALL	-0.031a (-5.190)	-0.0270 (-1.633)	-0.019a (-3.284)	-0.055a (-5.522)	-0.0130 (-1.022)
MON	-0.046a (-4.762)	0.0150 (-0.534)	-0.025a (-2.764)	-0.117a (-7.604)	-0.061a (-3.034)
Tax	0.252a (6.734)	0.591a (5.781)	0.204a (5.548)	0.231a (3.763)	-0.0140 (-0.172)
BMS(-1)	-0.051a (-8.083)	-0.151a (-12.024)	0.208a (16.762)	0.0100 (0.804)	0.027b (2.130)
Adj-R <sup>2</sup>	0.008	0.027	0.057	0.019	0.002

Notes: The table reports the estimation results for Equation (1), which reads as follows.

(1)  $R_{i,t} = \alpha_0 + \alpha_{SAD}SAD_t + \alpha_{FALL}FALL_t + \alpha_{MON}MON_t + \alpha_{TAX}TAX_t + \sum_{j=1}^p d_j R_{i,t-j} + u_{i,t}$ .  $R_{i,t}$  is the daily return for the D1-D10 portfolio on day  $t$ ;  $\alpha_0$  is an intercept; and  $SAD_t$  equals  $(H_t - 12)$  for trading days in the fall and winter, and zero otherwise.  $H_t$  is the amount of time between sunset and sunrise. Hence,  $SAD$  denotes the length of the night relative to the average length of the night annually.  $FALL_t$  is an interactive dummy variable that takes the value of  $SAD_t$  starting from September 21 to December 20 in the northern hemisphere.  $MON_t$  is a dummy variable for Mondays (or the first trading day following a long weekend) and zero otherwise.  $Tax_t$  is a tax-loss selling dummy variable that takes the value of 1 for the day prior to and the four days following the start of a tax year and zero otherwise.  $R_{i,t-j}$  is a lagged value of the dependent variable that we included to control for autocorrelation. "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively.

The statistical significance of the coefficients in the model M1 (the entire sample) indicates that all the research variables are correlated with the outcome, and reasonably explain its variance. However, when examining the subsets individually, there are some indications of irrational factors' effect on the size premium. The coefficients of  $SAD$  and Monday were statistically significant in sub periods M3, M4, M5, implying that these variables affect the size premium. Monday has a negative effect on the SMB portfolio returns, where according to the data, on average, Mondays yielded 4.9% less return, on average.  $SAD$  also exhibited a consistent pattern in sub periods M3, M4, M5, and had a negative influence on the returns between July 1926 and June 2020. Somewhat unexpectedly, in the entire sample period M1,  $SAD$  had a significantly positive coefficient. However, in all five models, the variable Fall had a comparable or bigger influence on the SMB returns than  $SAD$ , so the effect of the cold season may be captured in this variable. In the following section, we report the results of the analysis of the date.

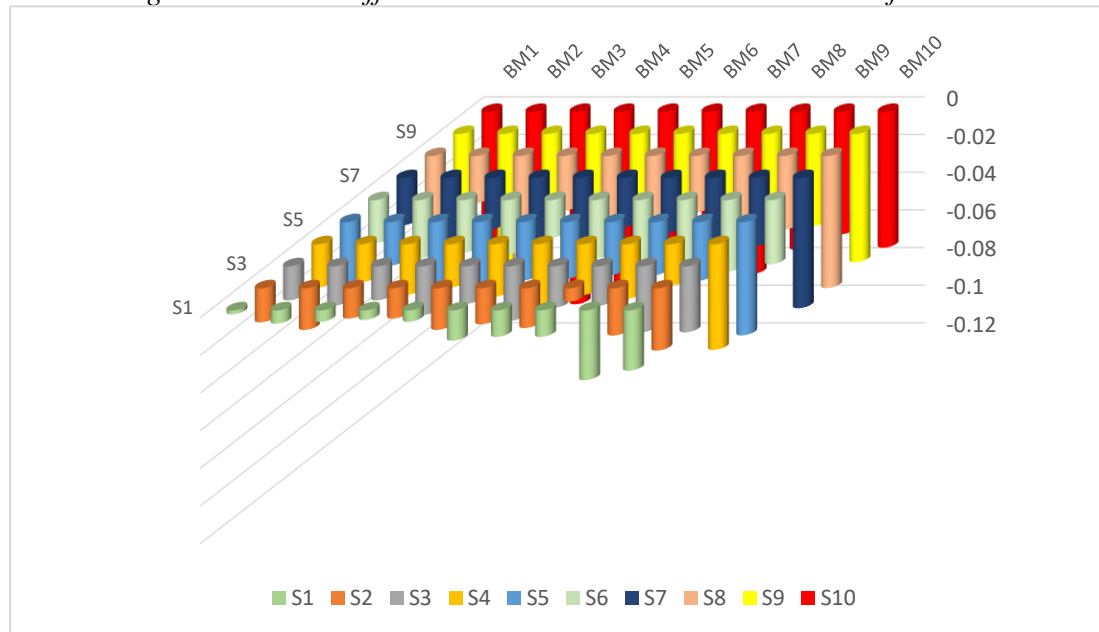
Table 3 below present the SAD coefficients across the one hundred portfolios for the entire sample. The classes BM1 through to BM10 refer to the shares deciles ranging from the lowest book to market value to the top decile of the highest book to market ratio shares. The portfolios across the vertical direction, denoted S1 through to S10 refer to the portfolios from the highest to the lowest size (total market value).

*Table 3: The SAD coefficients across the 100 portfolios: Value-Weighted daily Returns  
 Created Based on Size and Book-to-Market Ratios (10×10)*

**Panel A: Full sample (1926:07-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.032	-0.037	-0.014	-0.014	-0.016	-0.006	-0.005	-0.006	-0.007	-0.002
S2	-0.033	-0.025	-0.007	-0.021	-0.019	-0.022	-0.016	-0.016	-0.022	-0.018
S3	-0.035	-0.035	-0.021	-0.022	-0.029	-0.020	-0.026	-0.018	-0.021	-0.018
S4	-0.056	-0.022	-0.029	-0.027	-0.032	-0.028	-0.023	-0.027	-0.020	-0.023
S5	-0.060	-0.031	-0.028	-0.028	-0.030	-0.031	-0.033	-0.037	-0.023	-0.041
S6	-0.034	-0.038	-0.033	-0.033	-0.031	-0.020	-0.029	-0.028	-0.031	-0.023
S7	-0.069	-0.036	-0.032	-0.029	-0.026	-0.034	-0.035	-0.027	-0.033	-0.025
S8	-0.070	-0.039	-0.035	-0.030	-0.050	-0.042	-0.029	-0.056	-0.025	-0.049
S9	-0.068	-0.049	-0.044	-0.040	-0.045	-0.048	-0.058	-0.045	-0.076	-0.051
S10	-0.072	-0.065	-0.073	-0.086	-0.068	-0.081	-0.093	-0.102	-0.084	-0.097

*Figure 1: SAD Coefficients across 100 Cross-sectional Portfolios*

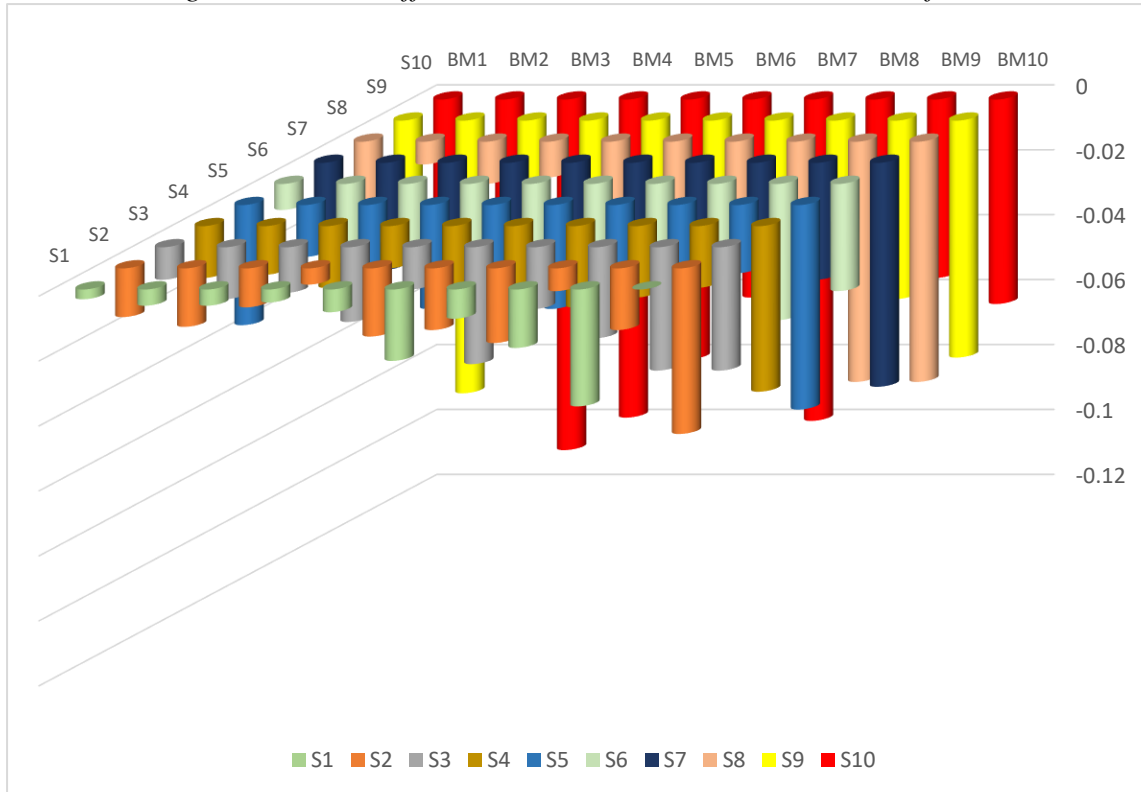


Notes: The figure depicts the SAD coefficients across value-weighted excess return of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from July 1926 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients (except for S10) compared with those with low book-to-market ratios (growth companies). Evidently, in all book-to-market groups, the higher the size of the companies, the stronger the SAD coefficient, that is, the effect of the mood of investors, that appears regularly each year at the same season on the desire to invest. We examine whether the same also applies throughout the entire period or are there differences in this effect during different sub periods. The following tables present the SAD coefficients for the one hundred portfolios estimated for two sub-periods: 1926 to 1973; 1974 to 2020.

**Panel B: subsample (1926:07-1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	0.000	-0.036	-0.018	-0.009	-0.022	-0.007	-0.004	-0.005	-0.005	-0.003
S2	-0.051	-0.019	-0.007	-0.023	-0.019	-0.021	-0.005	-0.012	-0.018	-0.015
S3	-0.038	-0.038	-0.028	-0.019	-0.036	-0.013	-0.023	-0.014	-0.016	-0.010
S4	-0.051	-0.019	-0.022	-0.025	-0.029	-0.022	-0.013	-0.019	-0.015	-0.016
S5	-0.063	-0.021	-0.030	-0.025	-0.032	-0.022	-0.032	-0.031	-0.016	-0.037
S6	-0.033	-0.042	-0.031	-0.030	-0.040	-0.018	-0.020	-0.025	-0.021	-0.008
S7	-0.069	-0.036	-0.032	-0.029	-0.026	-0.034	-0.035	-0.027	-0.033	-0.025
S8	-0.074	-0.074	-0.033	-0.023	-0.056	-0.041	-0.011	-0.013	-0.007	-0.041
S9	-0.073	-0.055	-0.042	-0.037	-0.047	-0.037	-0.062	-0.032	-0.084	-0.040
S10	-0.063	-0.055	-0.069	-0.099	-0.061	-0.080	-0.098	-0.108	-0.056	-0.066

*Figure 2: SAD Coefficients across 100 Cross-sectional Portfolios*

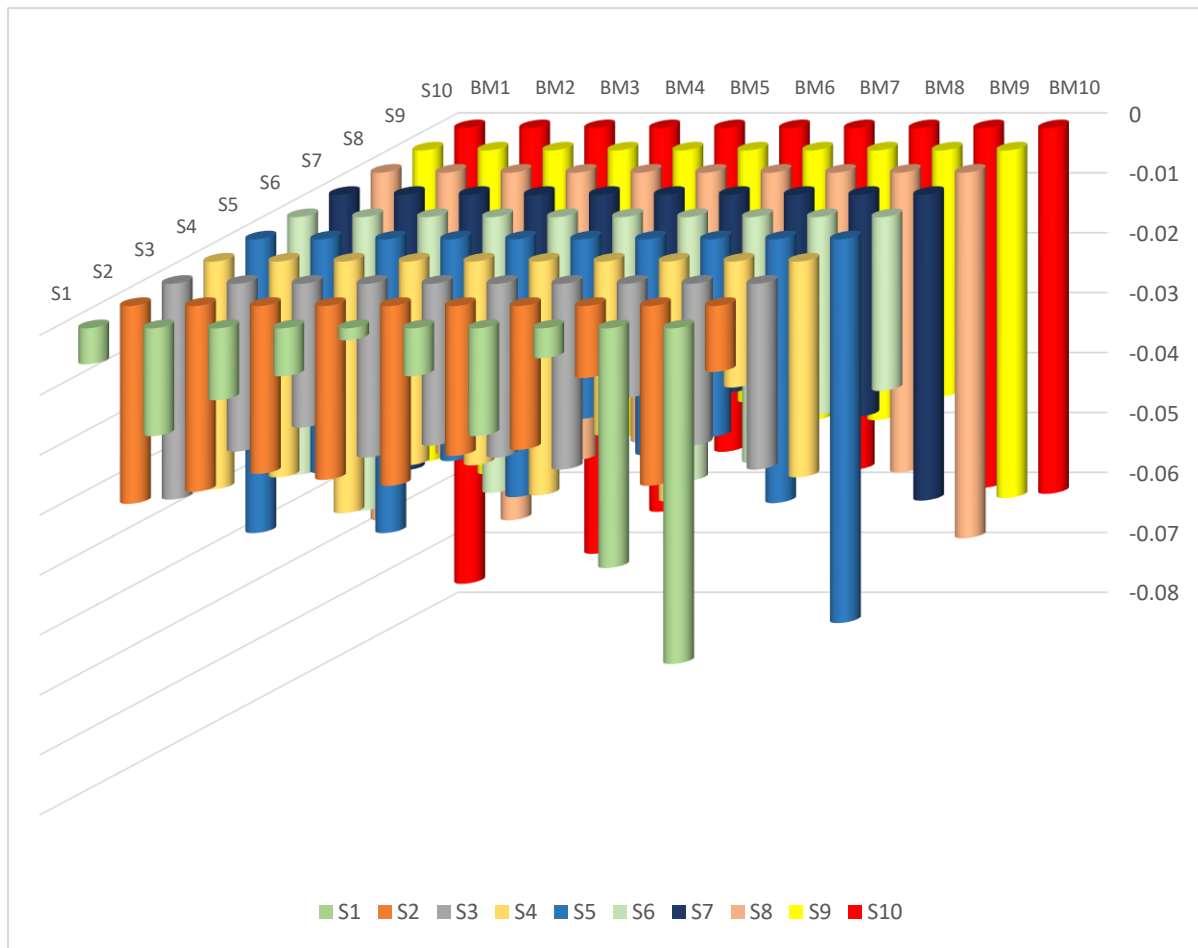


Notes: The figure depicts the SAD coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from July 1926 to December 1973. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients (except for S1) compared with those with low book-to-market ratios (growth companies).

**Panel C: subsample (1974:01-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.056	-0.040	-0.005	-0.018	-0.008	-0.002	-0.008	-0.012	-0.018	-0.006
S2	-0.011	-0.030	-0.012	-0.024	-0.025	-0.030	-0.029	-0.028	-0.031	-0.033
S3	-0.031	-0.027	-0.019	-0.031	-0.029	-0.027	-0.029	-0.024	-0.028	-0.036
S4	-0.036	-0.021	-0.04	-0.029	-0.039	-0.034	-0.034	-0.042	-0.036	-0.038
S5	-0.064	-0.044	-0.033	-0.036	-0.030	-0.043	-0.037	-0.049	-0.039	-0.049
S6	-0.029	-0.033	-0.041	-0.044	-0.026	-0.029	-0.046	-0.038	-0.049	-0.043
S7	-0.051	-0.037	-0.042	-0.033	-0.022	-0.034	-0.040	-0.040	-0.046	-0.040
S8	-0.061	-0.050	-0.040	-0.044	-0.043	-0.045	-0.048	-0.058	-0.047	-0.058
S9	-0.058	-0.041	-0.045	-0.045	-0.042	-0.050	-0.048	-0.051	-0.054	-0.052
S10	-0.061	-0.060	-0.057	-0.057	-0.054	-0.054	-0.064	-0.071	-0.060	-0.076

Figure 3: SAD Coefficients across 100 Cross-sectional Portfolios



Notes: The figure depicts the SAD coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from January 1974 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients compared with those with low book-to-market ratios (growth companies).

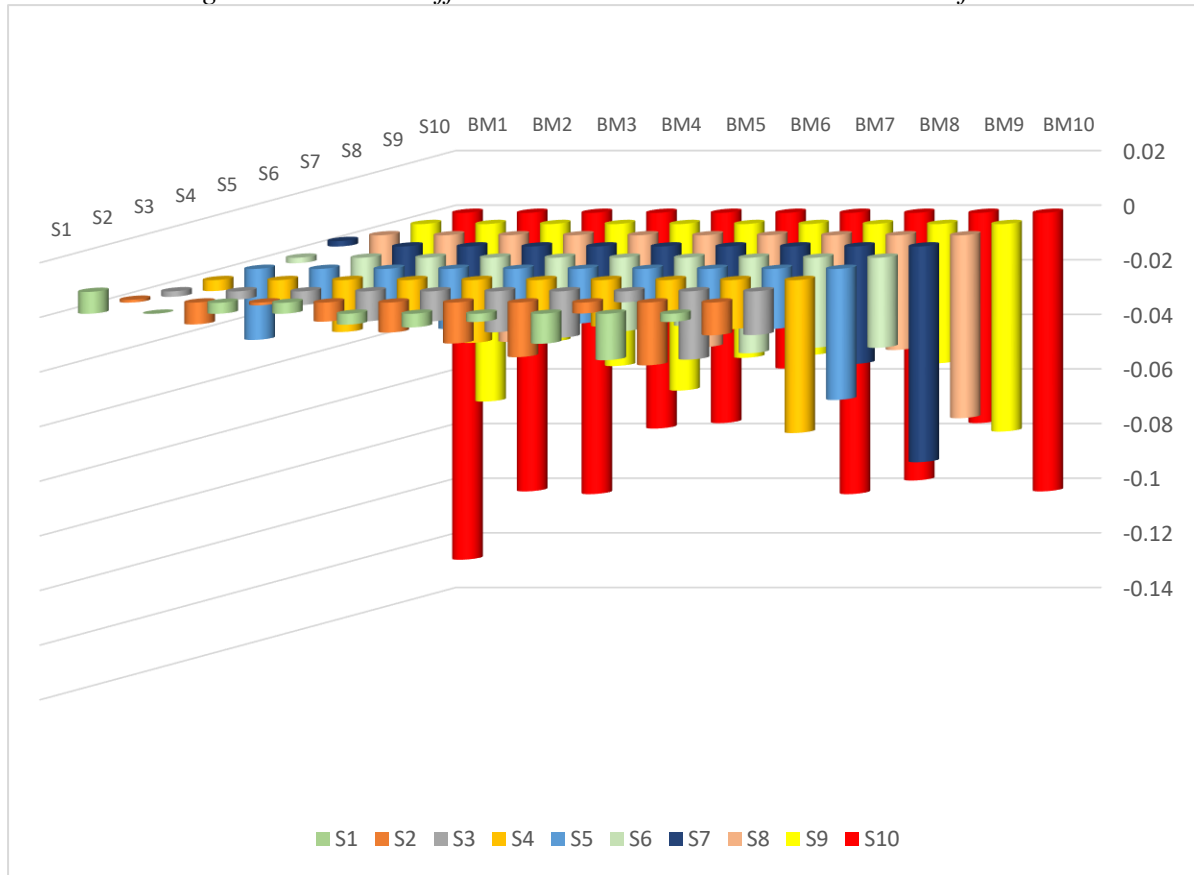
In a similar manner, the following tables present the FALL coefficients for the one hundred portfolios estimated for two sub-periods: 1926 to 1973; 1974 to 2020.

Table 4: The FALL coefficients across the 100 portfolios: Value-Weighted daily Returns  
 Created Based on Size and Book-to-Market Ratios (10×10)

Panel A: Full sample (1926:07-2020:06)

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.003	-0.017	-0.011	-0.003	-0.005	-0.004	0.004	0.004	0.000	0.008
S2	-0.012	-0.023	-0.004	-0.020	-0.015	-0.011	-0.007	-0.001	-0.008	0.001
S3	-0.016	-0.025	-0.004	-0.017	-0.015	-0.011	-0.011	-0.005	-0.003	-0.002
S4	-0.056	-0.018	-0.013	-0.017	-0.019	-0.023	-0.012	-0.019	-0.008	-0.004
S5	-0.048	-0.022	-0.022	-0.012	-0.020	-0.018	-0.022	-0.018	-0.012	-0.026
S6	-0.033	-0.033	-0.035	-0.025	-0.027	-0.013	-0.015	-0.017	-0.015	-0.002
S7	-0.079	-0.043	-0.023	-0.022	-0.023	-0.027	-0.028	-0.015	-0.023	0.002
S8	-0.067	-0.042	-0.028	-0.027	-0.041	-0.032	-0.030	-0.039	-0.017	-0.027
S9	-0.076	-0.051	-0.043	-0.048	-0.049	-0.061	-0.052	-0.043	-0.065	-0.020
S10	-0.102	-0.077	-0.098	-0.103	-0.057	-0.077	-0.079	-0.103	-0.102	-0.127

Figure 4: FALL Coefficients across 100 Cross-sectional Portfolios



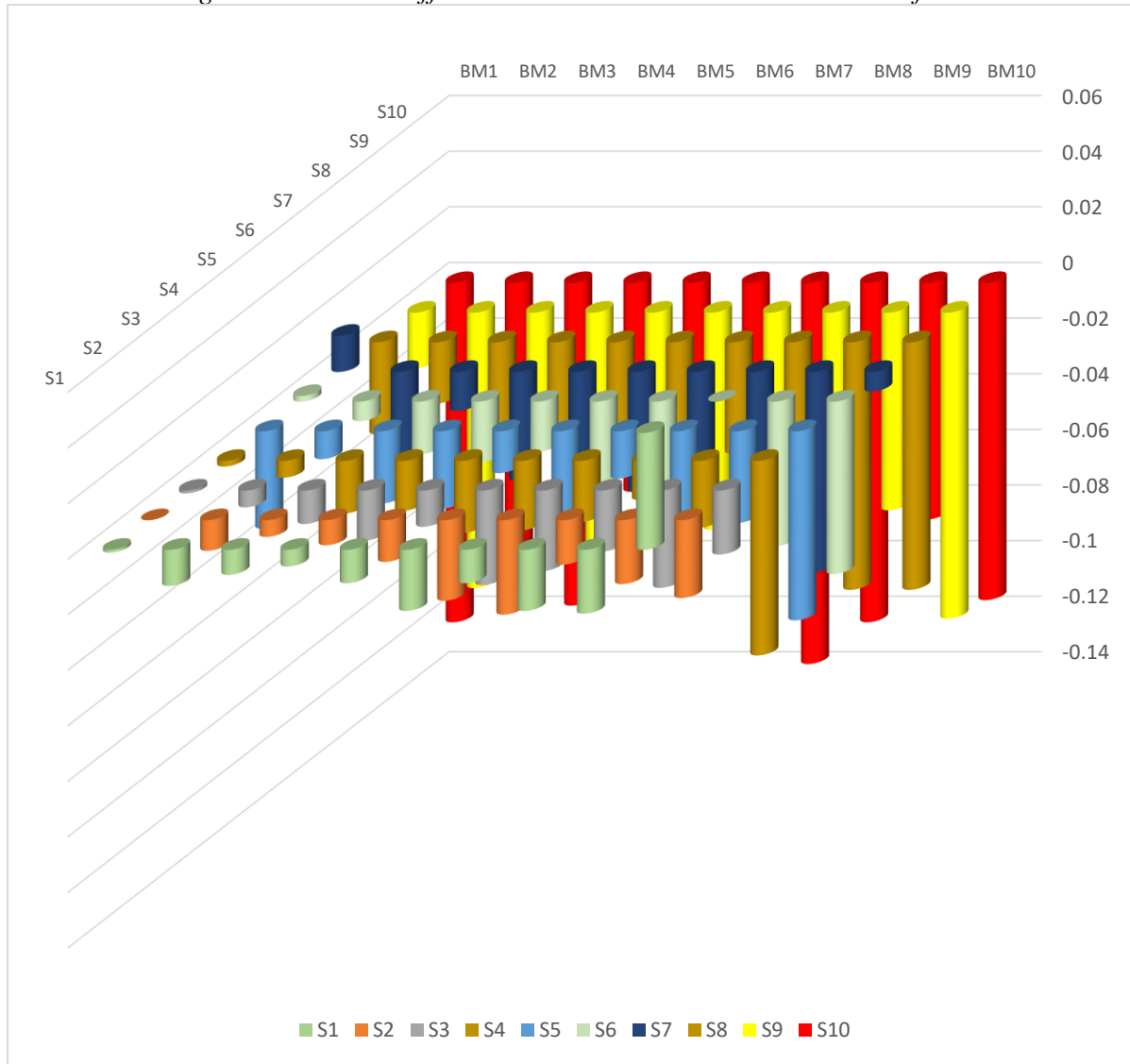
Notes: The figure depicts the FALL coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from July 1926 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients compared with those with low book-to-market ratios (growth companies).

Evidently, in all book-to-market groups, the higher the size of the companies, the stronger the FALL coefficient, that is, the effect of the mood of investors, that appears regularly each year at the same season on the desire to invest. We examine whether the same also applies throughout the entire period or are there differences in this effect during different sub periods. The following tables present the FALL coefficients for the one hundred portfolios estimated for two sub-periods: 1926 to 1973; 1974 to 2020.

**Panel B: Subsample (1926:07-1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	0.042	-0.023	-0.022	-0.012	-0.022	-0.012	-0.006	-0.009	-0.013	-0.001
S2	-0.028	-0.023	-0.016	-0.034	-0.029	-0.015	-0.009	-0.006	-0.011	0.000
S3	-0.023	-0.035	-0.022	-0.029	-0.034	-0.013	-0.018	-0.012	-0.006	-0.001
S4	-0.070	-0.024	-0.014	-0.022	-0.025	-0.026	-0.018	-0.019	-0.006	-0.002
S5	-0.068	-0.033	-0.036	-0.017	-0.031	-0.015	-0.028	-0.026	-0.010	-0.035
S6	-0.062	-0.052	-0.05b	-0.029	-0.036	-0.018	-0.022	-0.019	-0.007	0.002
S7	-0.007	-0.072	-0.033	-0.031	-0.043	-0.038	-0.039	-0.014	-0.031	0.013
S8	-0.089	-0.089	-0.037	-0.040	-0.063	-0.045	-0.035	-0.037	-0.022	-0.033
S9	-0.110	-0.071	-0.057	-0.066	-0.078	-0.080	-0.086	-0.041	-0.099	-0.020
S10	-0.114	-0.085	-0.122	-0.137	-0.048	-0.075	-0.075	-0.116	-0.108	-0.122

*Figure 5: FALL Coefficients across 100 Cross-sectional Portfolios*

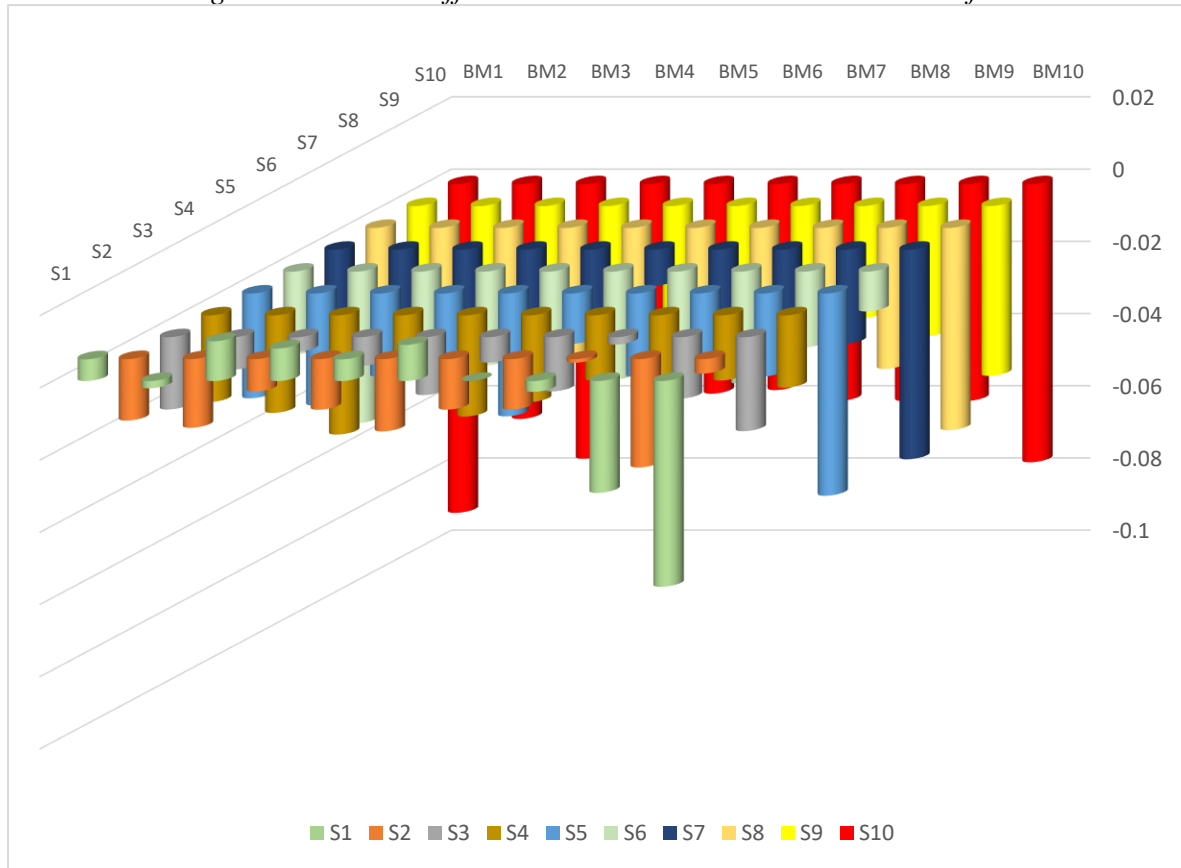


Notes: The figure depicts the FALL coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from July 1926 to December 1973. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients (except for S1, S10) compared with those with low book-to-market ratios (growth companies).

**Panel C: subsample (1974:01-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.057	-0.031	-0.003	0.000	0.010	0.006	0.009	0.011	-0.002	0.006
S2	-0.004	-0.030	-0.001	-0.014	-0.014	-0.020	-0.014	-0.009	-0.019	-0.017
S3	-0.026	-0.017	-0.002	-0.015	-0.007	-0.016	-0.008	-0.004	-0.009	-0.020
S4	-0.020	-0.018	-0.027	-0.018	-0.024	-0.028	-0.013	-0.033	-0.027	-0.024
S5	-0.056	-0.023	-0.019	-0.023	-0.014	-0.034	-0.027	-0.023	-0.031	-0.029
S6	-0.011	-0.021	-0.031	-0.034	-0.030	-0.022	-0.026	-0.030	-0.042	-0.023
S7	-0.058	-0.026	-0.029	-0.023	-0.010	-0.021	-0.027	-0.025	-0.035	-0.025
S8	-0.056	-0.039	-0.028	-0.021	-0.028	-0.029	-0.037	-0.036	-0.027	-0.037
S9	-0.047	-0.036	-0.031	-0.036	-0.022	-0.039	-0.021	-0.049	-0.033	-0.030
S10	-0.077	-0.060	-0.060	-0.060	-0.057	-0.058	-0.072	-0.076	-0.065	-0.091

*Figure 6: FALL Coefficients across 100 Cross-sectional Portfolios*



Notes: The figure depicts the FALL coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from January 1974 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients (except for S2, S4, S6, S10) compared with those with low book-to-market ratios (growth companies).

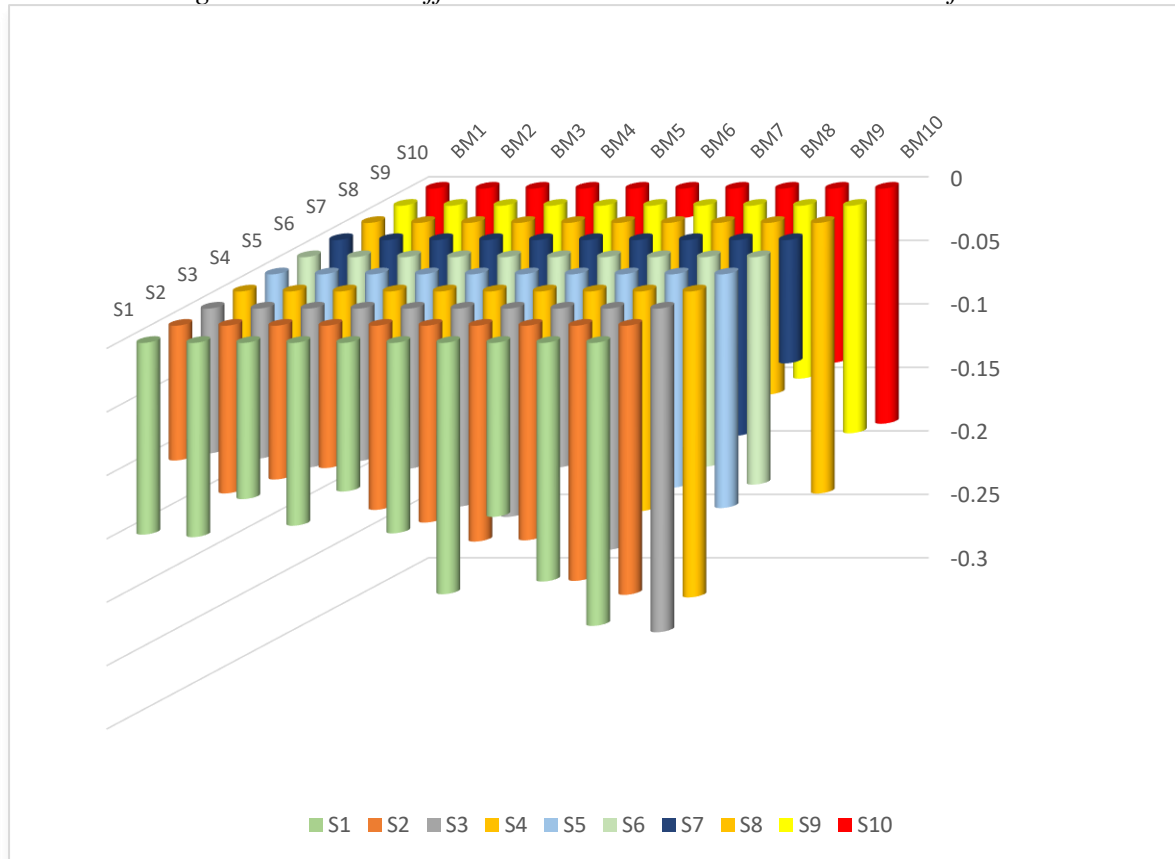
The following tables present the MON coefficients for the one hundred portfolios estimated for two sum-periods: 1926 to 1973; 1974 to 2020.

*Table 5: The MON coefficients across the 100 portfolios: Value-Weighted daily Returns  
 Created Based on Size and Book-to-Market Ratios (10×10)*

**Panel A: Full sample (1926:07-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.223	-0.188	-0.137	-0.198	-0.150	-0.117	-0.144	-0.123	-0.153	-0.151
S2	-0.212	-0.201	-0.169	-0.170	-0.155	-0.145	-0.112	-0.121	-0.132	-0.106
S3	-0.255	-0.190	-0.125	-0.164	-0.156	-0.126	-0.120	-0.125	-0.118	-0.114
S4	-0.241	-0.173	-0.176	-0.148	-0.136	-0.120	-0.124	-0.118	-0.127	-0.107
S5	-0.184	-0.168	-0.145	-0.102	-0.112	-0.095	-0.139	-0.103	-0.100	-0.085
S6	-0.179	-0.165	-0.118	-0.140	-0.128	-0.125	-0.135	-0.123	-0.141	-0.089
S7	-0.097	-0.154	-0.132	-0.137	-0.126	-0.116	-0.115	-0.118	-0.137	-0.071
S8	-0.213	-0.135	-0.109	-0.117	-0.111	-0.146	-0.122	-0.106	-0.082	-0.093
S9	-0.179	-0.136	-0.093	-0.131	-0.121	-0.094	-0.075	-0.150	-0.104	-0.144
S10	-0.185	-0.137	-0.092	-0.091	-0.023	-0.118	-0.105	-0.039	-0.090	-0.161

Figure 7: MON Coefficients across 100 Cross-sectional Portfolios



Notes: The figure depicts the MON coefficients across value-weighted excess returns of 100 portfolios Ranked according to their size, and then according to their book-to-market ratios from July 1926 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients compared with those with low book-to-market ratios (growth companies).

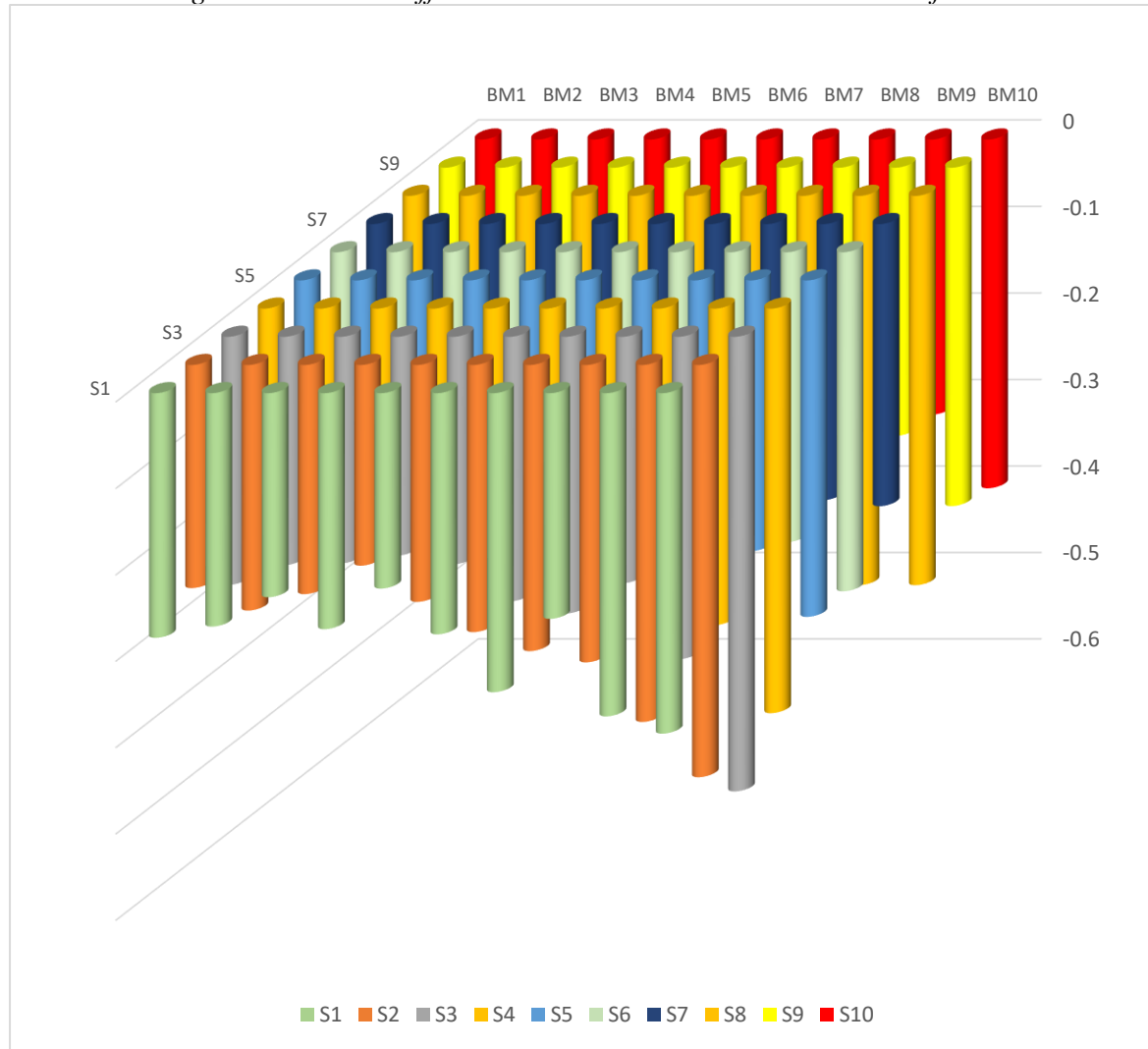
Evidently, in all book-to-market groups, the higher size of the companies, the stronger the MON coefficient, that is, the effect of the mood of investors, that appears regularly each year at the same season on the desire to invest. We examine whether the same also applies throughout the entire period or are there differences in this effect during different sub periods. The following tables present the MON coefficients for the one hundred portfolios estimated for two sub-periods: 1926 to 1973; 1974 to 2020.

**Panel B: Subsample (1926:07-1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.394	-0.374	-0.261	-0.346	-0.279	-0.226	-0.273	-0.236	-0.270	-0.283
S2	-0.477	-0.413	-0.344	-0.331	-0.309	-0.274	-0.232	-0.265	-0.284	-0.258
S3	-0.526	-0.373	-0.285	-0.320	-0.306	-0.263	-0.253	-0.262	-0.264	-0.287
S4	-0.468	-0.366	-0.338	-0.307	-0.297	-0.265	-0.277	-0.247	-0.280	-0.279
S5	-0.389	-0.313	-0.330	-0.230	-0.240	-0.227	-0.315	-0.247	-0.236	-0.245
S6	-0.392	-0.335	-0.261	-0.313	-0.284	-0.281	-0.305	-0.285	-0.326	-0.268
S7	-0.326	-0.319	-0.291	-0.314	-0.273	-0.278	-0.253	-0.287	-0.311	-0.227
S8	-0.450	-0.450	-0.248	-0.273	-0.244	-0.307	-0.261	-0.270	-0.214	-0.290
S9	-0.391	-0.310	-0.230	-0.296	-0.280	-0.245	-0.199	-0.372	-0.286	-0.443
S10	-0.403	-0.318	-0.227	-0.230	-0.104	-0.292	-0.287	-0.189	-0.287	-0.521



Figure 8: MON Coefficients across 100 Cross-sectional Portfolios

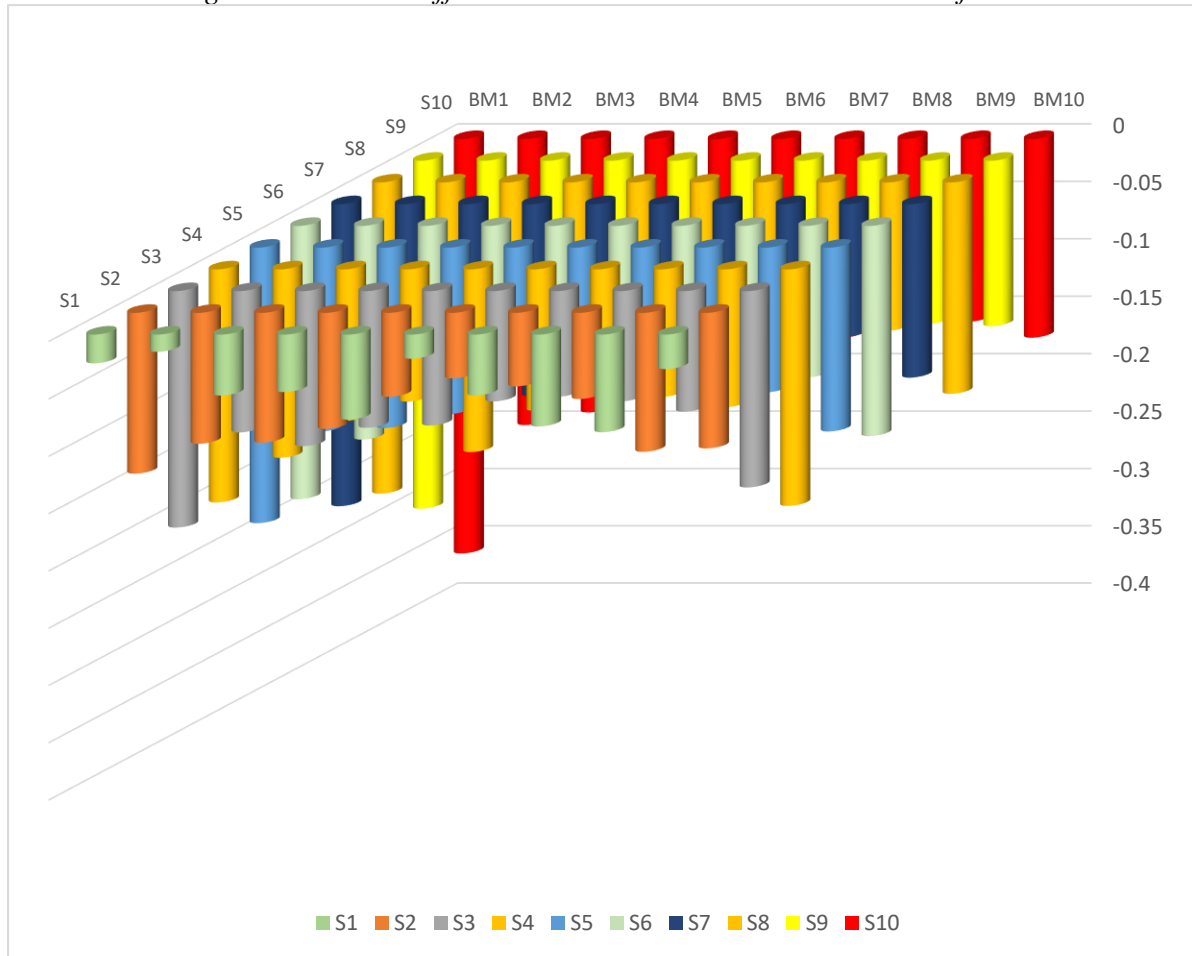


Notes: The figure depicts the MON coefficients across value-weighted excess returns of 100 portfolios Ranked according to their size, and then according to their book-to-market ratios from July 1926 to December 1973. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively very low coefficients (except for S9, S10) compared with those with low book-to-market ratios (growth companies).

Panel C: subsample (1974:01-2020:06)

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	-0.030	-0.085	-0.080	-0.053	-0.021	-0.074	-0.050	-0.053	-0.015	-0.025
S2	-0.118	-0.121	-0.075	-0.064	-0.057	-0.073	-0.101	-0.113	-0.114	-0.140
S3	-0.171	-0.105	-0.096	-0.092	-0.096	-0.117	-0.119	-0.135	-0.123	-0.206
S4	-0.206	-0.120	-0.111	-0.102	-0.123	-0.159	-0.115	-0.132	-0.164	-0.203
S5	-0.160	-0.126	-0.113	-0.124	-0.107	-0.107	-0.145	-0.157	-0.160	-0.240
S6	-0.183	-0.132	-0.098	-0.106	-0.126	-0.120	-0.133	-0.151	-0.186	-0.238
S7	-0.151	-0.115	-0.126	-0.119	-0.108	-0.124	-0.167	-0.180	-0.169	-0.263
S8	-0.184	-0.129	-0.119	-0.128	-0.130	-0.145	-0.144	-0.171	-0.199	-0.271
S9	-0.144	-0.142	-0.136	-0.121	-0.157	-0.164	-0.190	-0.190	-0.204	-0.303
S10	-0.173	-0.159	-0.152	-0.173	-0.169	-0.191	-0.177	-0.238	-0.249	-0.361

Figure 9: MON Coefficients across 100 Cross-sectional Portfolios



Notes: The figure depicts the MON coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from January 1974 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively high coefficients compared with those with low book-to-market ratios (growth companies).

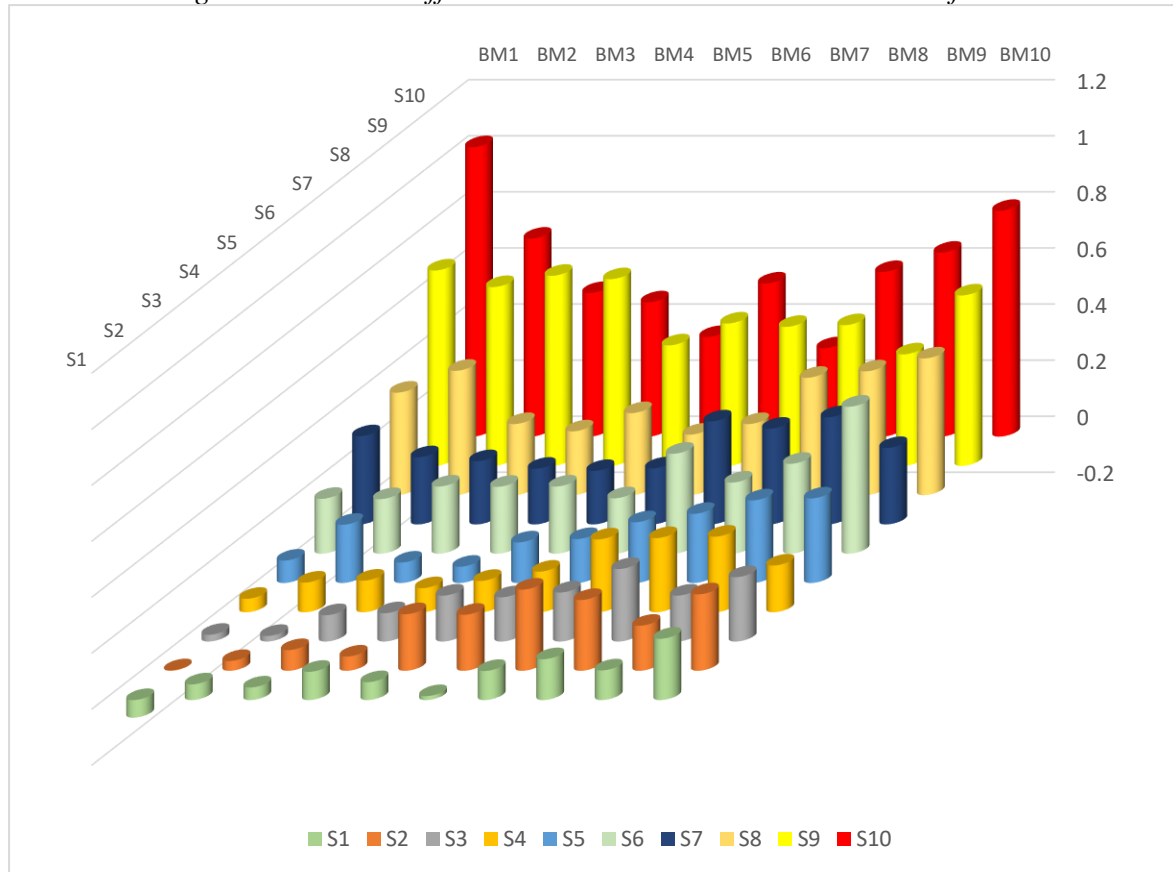
Finally, the following tables present the TAX coefficients for the one hundred portfolios estimated for two sum-periods: 1926 to 1973; 1974 to 2020.

Table 6: The TAX coefficients across the 100 portfolios: Value-Weighted daily Returns  
 Created Based on Size and Book-to-Market Ratios (10×10)

**Panel A: Full sample (1926:07-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	0.219	0.106	0.146	0.104	0.014	0.064	0.101	0.045	0.056	-0.063
S2	0.273	0.161	0.253	0.290	0.200	0.202	0.051	0.074	0.035	0.002
S3	0.230	0.164	0.259	0.175	0.158	0.164	0.101	0.094	0.020	0.024
S4	0.167	0.270	0.265	0.260	0.145	0.112	0.086	0.113	0.106	0.048
S5	0.302	0.295	0.247	0.217	0.157	0.145	0.058	0.073	0.208	0.080
S6	0.525	0.321	0.254	0.357	0.198	0.240	0.239	0.240	0.195	0.196
S7	0.273	0.383	0.342	0.368	0.200	0.191	0.199	0.226	0.240	0.315
S8	0.488	0.442	0.419	0.254	0.216	0.293	0.228	0.254	0.444	0.366
S9	0.608	0.398	0.502	0.496	0.508	0.430	0.666	0.678	0.638	0.697
S10	0.805	0.656	0.587	0.315	0.546	0.355	0.479	0.512	0.706	1.032

*Figure 10: TAX Coefficients across 100 Cross-sectional Portfolios*



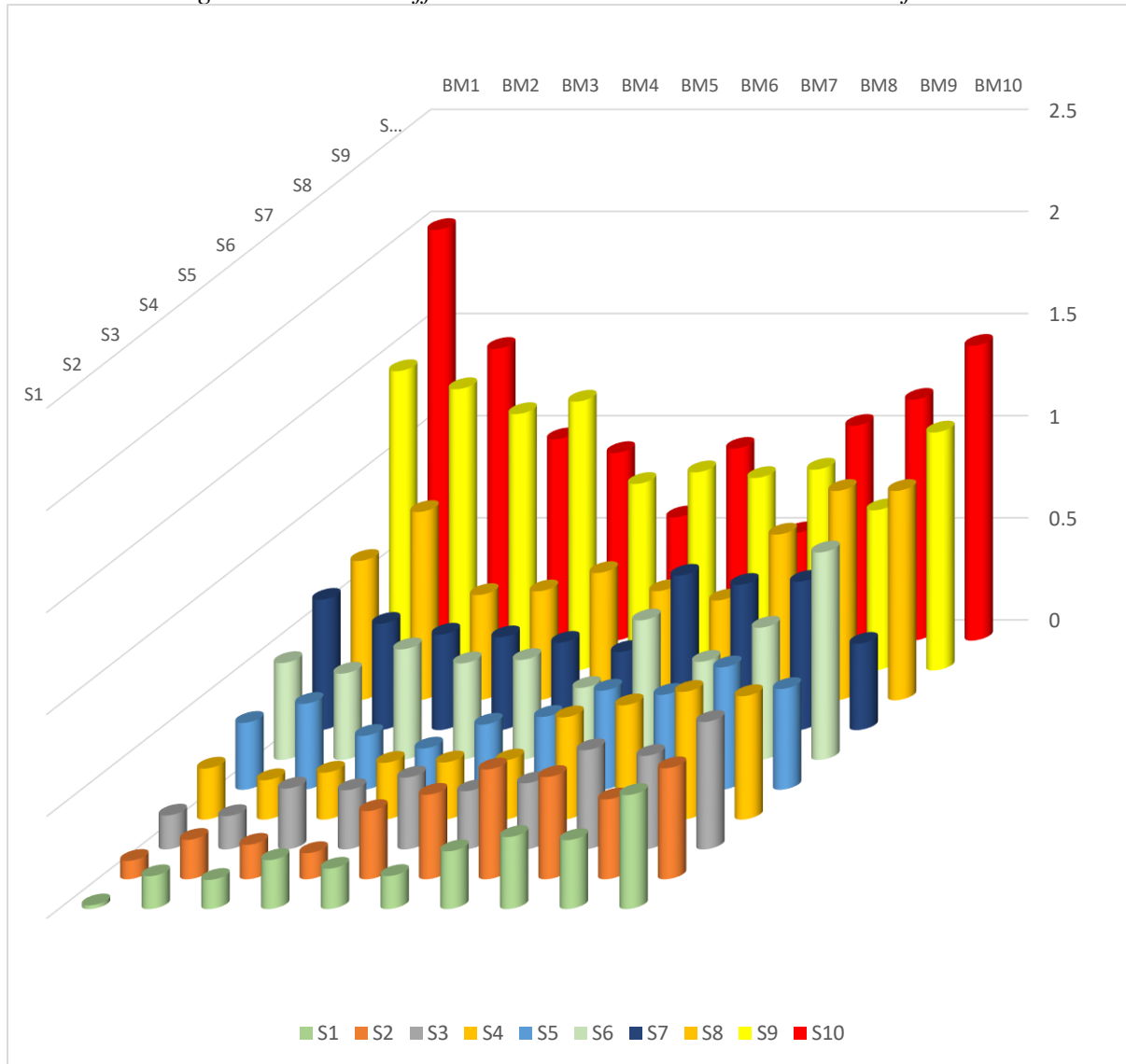
Notes: The figure depicts the TAX coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from July 1926 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively high coefficients (except for S7, S9, S10) compared with those with low book-to-market ratios (growth companies).

Evidently, in all book-to-market groups, the higher size of the companies, the stronger the TAX coefficient, that is, the effect of the mood of investors, that appears regularly each year at the same season on the desire to invest. We examine whether the same also applies throughout the entire period or are there differences in this effect during different sub periods. The following tables present the TAX coefficients for the one hundred portfolios estimated for two sub-periods: 1926 to 1973; 1974 to 2020.

**Panel B: Subsample (1926:07-1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	0.559	0.338	0.353	0.283	0.162	0.198	0.240	0.143	0.161	0.018
S2	0.544	0.391	0.501	0.538	0.414	0.334	0.128	0.169	0.193	0.09
S3	0.625	0.458	0.486	0.324	0.285	0.352	0.290	0.298	0.163	0.166
S4	0.605	0.626	0.560	0.501	0.290	0.280	0.278	0.230	0.193	0.250
S5	0.494	0.600	0.465	0.486	0.357	0.319	0.202	0.264	0.421	0.328
S6	1.017	0.648	0.481	0.684	0.353	0.490	0.473	0.542	0.423	0.475
S7	0.423	0.727	0.712	0.757	0.383	0.428	0.455	0.468	0.521	0.639
S8	1.026	1.026	0.812	0.489	0.535	0.624	0.534	0.516	0.923	0.683
S9	1.166	0.785	0.984	0.943	0.971	0.914	1.317	1.256	1.378	1.466
S10	1.444	1.180	1.052	0.526	0.940	0.604	0.919	0.986	1.429	2.011

Figure 11: TAX Coefficients across 100 Cross-sectional Portfolios

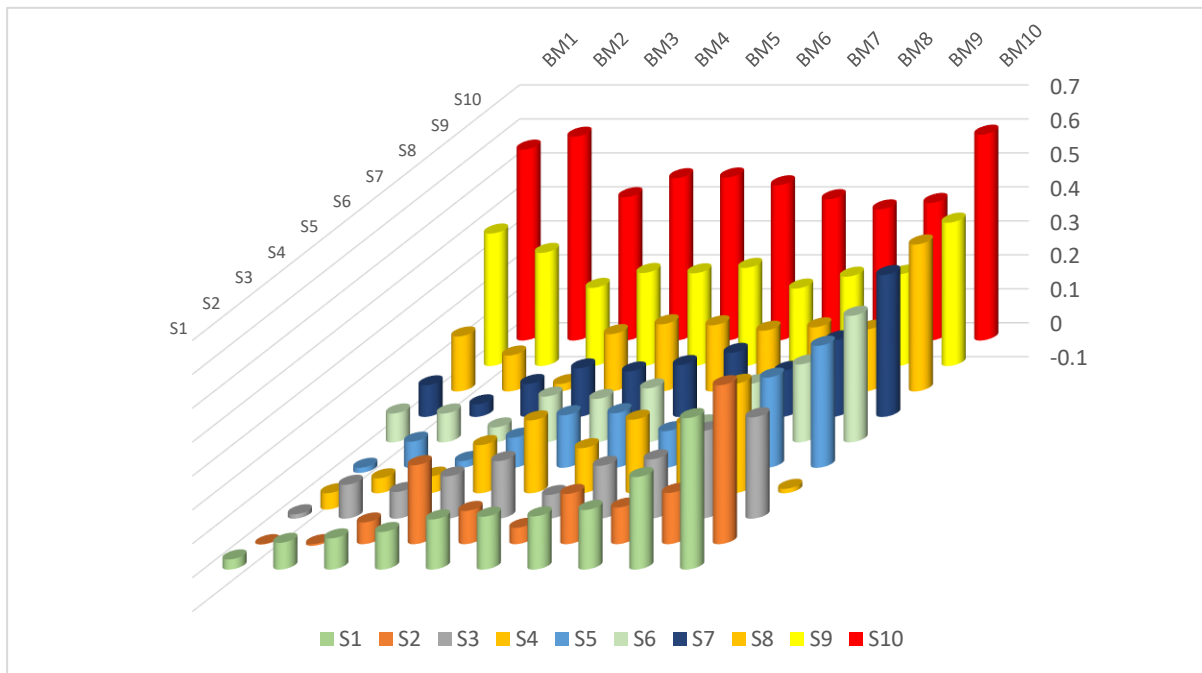


Notes: The figure depicts the TAX coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from July 1926 to December 1973. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively high coefficients (except for S7, S9, S10) compared with those with low book-to-market ratios (growth companies).

Panel C: subsample (1974:01-2020:06)

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
S1	0.447	0.273	0.176	0.157	0.156	0.148	0.111	0.092	0.079	0.030
S2	0.469	0.151	0.108	0.148	0.048	0.098	0.233	0.064	-0.005	-0.001
S3	0.299	0.258	0.175	0.156	0.070	0.170	0.125	0.079	0.100	0.013
S4	0.013	0.323	0.207	0.217	0.133	0.215	0.142	0.049	0.044	-0.048
S5	0.360	0.266	0.096	0.108	0.161	0.155	0.089	0.020	0.077	-0.015
S6	0.373	0.230	0.172	0.053	0.159	0.128	0.135	0.044	0.085	0.085
S7	0.418	0.226	0.136	0.189	0.153	0.134	0.143	0.097	0.037	0.093
S8	0.433	0.182	0.189	0.179	0.195	0.198	0.169	0.022	0.106	0.162
S9	0.422	0.269	0.263	0.228	0.289	0.273	0.274	0.230	0.333	0.390
S10	0.606	0.405	0.386	0.416	0.457	0.480	0.478	0.422	0.600	0.562

*Figure 12: TAX Coefficients across 100 Cross-sectional Portfolios*



Notes: The figure depicts the TAX coefficients across value-weighted excess returns of 100 portfolios ranked according to their size, and then according to their book-to-market ratios from January 1974 to June 2020. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks). The figure indicates that small firms with high book-to-market ratios (value companies) are associated with relatively high coefficients compared with those with low book-to-market ratios (growth companies).

## 6. CONCLUSIONS

This paper aimed at investigating the effect of the irrational factors Monday and seasonal affective disorder (SAD) on the size premium in stock returns. The investigation was rather exploratory, and the results imply certain effects of the irrational factors on the returns of the SMB portfolio exist. The effect of Monday on the SMB returns is statistically significant, but does not explain much of the returns' variance. The interesting findings appear when we sort the 100 portfolios by book-to-market ratio and size. The inconsistency of the negative Monday effect was most pronounced in the last sub-period (1974-2020). The coefficients the 100 portfolios in this period suggest that large size is associated with a more negative excess return on Monday. We found that Seasonal Affective Disorder is significantly negatively correlated with SMB returns during the entire periods and all sub-period except 1926-1947. When the 100 portfolios were examined detail, we found that the strongest effect of SAD was on larger size portfolios, almost regardless of their book-to-market value. The effect of Fall on the was dramatic for the largest market size companies, and almost negligible for smaller companies. This result suggests that the irrational behavior observed among investors during the cold season affects larger size portfolios more. The effect of taxation tends to grow with the company size in the cross-sectional portfolios. In general, the results of this thesis suggest that the size effect is indeed affected by irrational factors. Moreover, this effect of the irrational factors seems to depend on size. This opens a new and interesting direction in portfolio construction which exploits the irrational factors' effect on the size-premium, especially of value stocks. However, the explanatory power of the results presented in this thesis is small and further work is required.

A more intricate model which considers the type of assets in the portfolio may clarify the relationship between the irrational factors and size effect, in a statistically sound procedure. Another limitation is the focus on US stocks. Research on the effects of irrational factors on the size premium can be done in emerging markets, where investor sentiment may differ due to cultural and geographical differences. Future studies can also consider these effects on specific segments of the investor population. In particular, it would be interesting and valuable to examine whether this effect is present among the many non-professional “retail” investors who joined the market in masses during the writing of this thesis.

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**APPENDIX:**

*Table A1: Descriptive statistics of the variables for sub-periods of the data*

**Panel B: Subsample I – July 1926 – April 1947**

	<b>SMB</b>	<b>Daylight</b>	<b>H</b>	<b>TAX</b>	<b>SAD</b>	<b>FALL</b>
<b>Mean</b>	0.010	12.199	11.801	0.011	-0.791	0.395
<b>Med</b>	0.030	12.220	11.780	0.000	0.000	0.000
<b>Max</b>	8.210	15.100	14.750	1.000	2.700	2.750
<b>Min</b>	-7.250	9.250	8.900	0.000	-2.750	-0.160
<b>S.D</b>	0.822	1.999	1.999	0.106	1.027	0.827
<b>Skew</b>	-0.464	-0.023	0.023	9.245	-0.811	1.891
<b>Kurt</b>	15.798	1.567	1.567	86.469	1.984	4.993
<b>#Obs</b>	6192	6192	6192	6192	6192	6192

Notes: The table report the descriptive statistics of the key variables used in the study. The sample in this panel consists of 6,192 observations covering July 1926 to April 28, 1947. For each variable, we report the mean, median, standard deviation, Skewness, Kurtosis and the number of observations.

**Panel C: Subsample II – April 1947 – May 1971**

	<b>SMB</b>	<b>Daylight</b>	<b>H</b>	<b>TAX</b>	<b>SAD</b>	<b>FALL</b>
<b>Mean</b>	0.010	12.229	11.771	0.010	-0.778	0.385
<b>Med</b>	2.370	12.240	11.760	0.000	0.000	0.000
<b>Max</b>	-3.870	15.228	14.750	1.00	0.270	2.750
<b>Min</b>	0.290	9.250	8.770	0.000	-2.750	-0.270
<b>S.D</b>	-0.518	1.998	1.998	0.101	1.015	0.813
<b>Skew</b>	10.66	-0.028	0.028	9.683	-0.826	1.917
<b>Kurt</b>	10.66	1.564	1.564	94.76	2.018	5.111
<b>#Obs</b>	6192	6192	6192	6192	6192	6192

Notes: The table report the descriptive statistics of the key variables used in the study. The sample in this panel consists of 6,192 observations covering April 29, 1947 to May 25, 1971. For each variable, we report the mean, median, standard deviation, Skewness, Kurtosis and the number of observations.

**Panel D: Subsample III – May 1971 – November 1995**

	<b>SMB</b>	<b>Daylight</b>	<b>H</b>	<b>TAX</b>	<b>SAD</b>	<b>FALL</b>
<b>Mean</b>	0.001	12.305	11.697	0.011	-0.742	0.377
<b>Med</b>	0.020	12.325	11.680	0.000	0.000	0.000
<b>Max</b>	6.200	15.228	14.730	1.000	0.270	2.730
<b>Min</b>	-11.62	9.267	8.770	0.000	-2.730	-0.260
<b>S.D</b>	0.478	1.997	1.998	0.103	0.988	0.793
<b>Skew</b>	-2.592	-0.034	0.034	9.530	-0.861	1.909
<b>Kurt</b>	68.396	1.568	1.567	91.829	2.085	5.096
<b>#Obs</b>	6192	6192	6192	6192	6192	6192

Notes: The table report the descriptive statistics of the key variables used in the study. The sample in this panel consists of 6,192 observations covering May 27, 1971 to November 22, 1995. For each variable, we report the mean, median, standard deviation, Skewness, Kurtosis and the number of observations.

**Panel E: Subsample IV – November 1995 – June 2020**

	<b>SMB</b>	<b>Daylight</b>	<b>H</b>	<b>TAX</b>	<b>SAD</b>	<b>FALL</b>
<b>Mean</b>	0.004	12.295	11.706	0.011	-0.744	0.378
<b>Med</b>	0.010	12.327	11.675	0.000	0.000	0.000
<b>Max</b>	5.600	15.231	14.740	1.000	1.640	2.740
<b>Min</b>	-5.090	9.256	8.770	0.000	-2.740	-1.180
<b>S.D</b>	0.620	2.000	2.000	0.104	0.988	0.801
<b>Skew</b>	-0.143	-0.036	0.036	9.385	-0.831	1.908
<b>Kurt</b>	7.814	1.565	1.565	89.07	2.084	5.079
<b>#Obs</b>	6192	6192	6192	6192	6192	6192

Notes: The table report the descriptive statistics of the key variables used in the study. The sample in this panel consists of 6,192 observations covering November 24, 1995 to June 30, 2020. For each variable, we report the mean, median, standard deviation, Skewness, Kurtosis and the number of observations.

*Table A2: Ten Size Portfolios with the highest B/M ratio*

**Panel A: Full sample (1926:07-2020:06)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
<b>C<sub>0</sub></b>	0.065a	0.067a	0.071a	0.056a	0.062a	0.057a	0.059a	0.056a	0.069a	0.064a
	(4.299)	(4.859)	(5.946)	(4.552)	(5.572)	(5.829)	(5.536)	(6.072)	(7.313)	(6.516)
<b>SAD</b>	-0.032b	-0.037b	-0.0140	-0.0140	-0.0160	-0.0060	-0.0050	-0.0060	-0.0070	-0.0020
	(-2.071)	(-2.403)	(-1.154)	(-1.218)	(-1.447)	(-0.706)	(-0.506)	(-0.751)	(-0.809)	(-0.194)
<b>FALL</b>	-0.003	-0.0170	-0.0110	-0.0030	-0.0050	-0.0040	0.0040	0.0040	0.0000	0.0080
	(-0.135)	(-0.973)	(-0.780)	(-0.254)	(-0.391)	(-0.324)	(-0.336)	(-0.397)	(-0.011)	(-0.710)
<b>MON</b>	-0.223a	-0.188a	-0.137a	-0.198a	-0.150a	-0.117a	-0.144a	-0.123a	-0.153a	-0.151a
	(-7.194)	(-6.506)	(-5.351)	(-7.950)	(-6.726)	(-5.694)	(-6.667)	(-6.243)	(-7.544)	(-7.308)
<b>Tax</b>	0.2190	0.1060	0.146 c	0.1040	0.0140	0.0640	0.1010	0.0450	0.0560	-0.0630
	(-1.427)	(-1.086)	(-1.668)	(-1.003)	(-0.167)	(-0.849)	(-1.134)	(-0.669)	(-0.726)	(-0.768)
<b>R(-1)</b>	-0.007	-0.0170	-0.004	0.0070	0.0100	0.025c	0.0220	0.03b0	0.0160	0.0220
	(-0.363)	(-0.965)	(-0.286)	(-0.396)	(-0.743)	(-1.685)	(-1.191)	(-2.157)	(-1.139)	(-1.581)
<b>Adj-R<sup>2</sup></b>	0.003	0.002	0.001	0.003	0.002	0.002	0.002	0.002	0.003	0.003

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel B: Subsample (1926:07 -1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
$C_0$	0.094a (4.420)	0.104a (5.093)	0.092a (5.379)	0.084a (4.450)	0.078a (4.545)	0.070a (4.806)	0.072a (4.520)	0.073a (5.611)	0.088a (6.580)	0.083a (5.995)
SAD	0.000 (0.017)	-0.036c (-1.783)	-0.0180 (-1.26)	-0.0090 (-0.574)	-0.0220 (-1.360)	-0.0070 (-0.582)	-0.0040 (-0.316)	-0.0050 (-0.477)	-0.0050 (-0.452)	-0.0030 (-0.278)
FALL	0.042c (1.666)	-0.0230 (-1.004)	-0.0220 (-1.274)	-0.0120 (-0.627)	-0.0220 (-1.125)	-0.0120 (-0.737)	-0.0060 (-0.349)	-0.0090 (-0.613)	-0.0130 (-0.911)	-0.0010 (-0.045)
MON	-0.394a (-8.905)	-0.374a (-9.138)	-0.261a (-7.008)	-0.346a (-9.449)	-0.279a (-8.371)	-0.226a (-7.795)	-0.273a (-8.717)	-0.236a (-8.335)	-0.270a (-9.355)	-0.283a (-9.710)
Tax	0.559a (3.462)	0.338a (2.700)	0.353a (2.906)	0.283b (1.899)	0.1620 (1.561)	0.198b (2.054)	0.240b (2.074)	0.143c (1.741)	0.161c (1.730)	0.0180 (0.158)
$R(-1)$	0.0030 (0.119)	-0.0190 (-1.106)	0.0130 (0.814)	0.027a (1.151)	0.0140 (0.741)	0.065a (3.565)	0.062a (2.858)	0.069a (4.983)	0.058a (3.654)	0.056a (3.843)
Adj- $R^2$	0.012	0.009	0.005	0.008	0.006	0.009	0.010	0.011	0.011	0.011

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:01- 2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
$C_0$	0.036c (1.727)	0.046b (2.411)	0.063a (3.646)	0.029c (1.814)	0.045a (3.197)	0.058a (4.390)	0.053a (3.780)	0.046a (3.478)	0.044a (3.364)	0.044a (3.206)
SAD	-0.056b (-2.564)	-0.040c (-1.779)	-0.0050 (-0.296)	-0.0180 (-1.178)	-0.0080 (-0.530)	-0.0020 (-0.120)	-0.0080 (-0.565)	-0.0120 (-0.941)	-0.0180 (-1.367)	-0.0060 (-0.398)
FALL	-0.057b (-2.136)	-0.0310 (-1.125)	-0.0030 (-0.113)	0.0000 (0.005)	0.0100 (0.598)	0.0060 (0.379)	0.0090 (0.520)	0.0110 (0.687)	-0.0020 (-0.104)	0.0060 (0.328)
MON	-0.0300 (-0.616)	-0.085c (-1.874)	-0.080c (-2.027)	-0.0530 (-1.533)	-0.0210 (-0.671)	-0.074b (-2.310)	-0.050c (-1.501)	-0.053c (-1.740)	-0.0150 (-0.490)	-0.0250 (-0.774)
Tax	0.447c (1.705)	0.273c (1.912)	0.1760 (0.981)	0.1570 (1.114)	0.1560 (1.009)	0.1480 (1.136)	0.1110 (0.732)	0.0920 (0.757)	0.0790 (0.693)	0.0300 (0.255)
$R(-1)$	-0.0120 (-0.480)	-0.0130 (-0.462)	-0.0210 (-0.798)	-0.0210 (-0.915)	0.0060 (0.311)	-0.0200 (-0.947)	-0.0310 (-1.203)	-0.0120 (-0.560)	-0.0280 (-1.306)	-0.0140 (-0.629)
Adj- $R^2$	0.001	0.001	0.001	0.001	0.000	0.001	0.001	0.000	0.001	00.000

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks)

*Table A3: Ten Size Portfolios with the 9th highest B/M ratio*

<b>Panel A: Full sample (1926:07-2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
C0	0.071a	0.085a	0.072a	0.073a	0.062a	0.060a	0.056a	0.049a	0.048a	0.042a
	(4.417)	(5.508)	(5.295)	(5.512)	(4.899)	(5.614)	(5.322)	(4.897)	(4.837)	(4.236)
SAD	-0.033c	-0.025c	-0.0070	-0.021c	-0.0190	-0.022b	-0.016b	-0.016b	-0.022b	-0.018b
	(-1.877)	(-1.759)	(-0.549)	(-1.778)	(-1.632)	(-2.202)	(-1.669)	(-1.861)	(-2.441)	(-2.062)
FALL	-0.0120	-0.0230	-0.0040	-0.0200	-0.0150	-0.0110	-0.0070	-0.0010	-0.0080	0.0010
	(-0.602)	(-1.356)	(-0.265)	(-1.380)	(-1.067)	(-0.831)	(-0.603)	(-0.060)	(-0.698)	(0.088)
MON	-0.212a	-0.201a	-0.169a	-0.170a	-0.155a	-0.145a	-0.112a	-0.121a	-0.132a	-0.106a
	(-6.497)	(-6.317)	(-6.351)	(-6.398)	(-6.549)	(-6.636)	(-5.532)	(-6.079)	(-6.298)	(-4.999)
Tax	0.273b	0.1610	0.253b	0.290b	0.200b	0.202b	0.0510	0.0740	0.0350	0.0020
	(2.166)	(1.286)	(2.332)	(2.561)	(2.396)	(2.419)	(0.601)	(1.089)	(0.452)	(0.025)
R(-1)	-0.0180	-0.0030	-0.0040	-0.0200	0.0150	0.0070	0.043a	0.053a	0.064a	0.078a
	(-1.310)	(-0.229)	(-0.192)	(-1.107)	(0.701)	(0.492)	(2.942)	(3.76)	(4.723)	(5.826)
Adj-R <sup>2</sup>	0.003	0.002	0.002	0.003	0.002	0.002	0.003	0.004	0.006	0.007

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

<b>Panel B: Subsample (1926:07-1973:12)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
C <sub>0</sub>	0.113a	0.129a	0.106a	0.100a	0.085a	0.076a	0.081a	0.067a	0.065a	0.066a
	(4.594)	(4.991)	(4.628)	(4.570)	(3.988)	(4.641)	(5.121)	(4.603)	(4.674)	(5.103)
SAD	-0.051b	-0.0190	-0.0070	-0.0230	-0.0190	-0.0210	-0.0050	-0.0120	-0.018	-0.0150
	(-2.189)	(-0.768)	(-0.335)	(-1.227)	(-0.992)	(-1.406)	(-0.399)	(-1.013)	(-1.578)	(-1.374)
FALL	-0.0280	-0.0230	-0.0160	-0.0340	-0.0290	-0.0150	-0.0090	-0.0060	-0.0110	0.0000
	(-1.026)	(-0.806)	(-0.681)	(-1.514)	(-1.296)	(-0.794)	(-0.563)	(-0.345)	(-0.689)	(-0.012)
MON	-0.477a	-0.413a	-0.344a	-0.331a	-0.309a	-0.274a	-0.232a	-0.265a	-0.284a	-0.258a
	(-10.046)	(-7.882)	(-7.796)	(-7.711)	(-8.094)	(-8.342)	(-7.855)	(-9.169)	(-9.785)	(-9.408)
Tax	0.544a	0.391c	0.501a	0.538a	0.414a	0.334a	0.1280	0.169c	0.193b	0.0900
	(3.337)	(1.852)	(2.882)	(2.785)	(3.340)	(2.897)	(1.046)	(1.896)	(2.055)	(1.031)
R(-1)	-0.026c	-0.009	0.0020	-0.0270	0.0140	-0.0020	0.055a	0.083a	0.101a	0.113a
	(-1.707)	(-0.528)	(0.085)	(-1.206)	(0.507)	(-0.119)	(3.134)	(4.792)	(5.756)	(7.907)
Adj-R <sup>2</sup>	0.011	0.005	0.006	0.007	0.006	0.006	0.007	0.013	0.018	0.020

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

<b>Panel C: Subsample (1974: 2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.060a	0.064a	0.052a	0.054a	0.049a	0.054a	0.051a	0.056a	0.056a	0.052a
	(2.700)	(4.147)	(3.775)	(3.879)	(3.817)	(3.978)	(3.733)	(4.247)	(4.047)	(3.395)
SAD	-0.0110	-0.030b	-0.0120	-0.024c	-0.025b	-0.030b	-0.029b	-0.028b	-0.031b	-0.033b
	(-0.429)	(-2.001)	(-0.881)	(-1.74)	(-1.971)	(-2.297)	(-2.089)	(-2.156)	(-2.256)	(-2.136)
FALL	-0.0040	-0.0300	-0.0010	-0.0140	-0.0140	-0.0200	-0.0140	-0.0090	-0.0190	-0.0170
	(-0.141)	(-1.600)	(-0.070)	(-0.865)	(-0.934)	(-1.161)	(-0.826)	(-0.566)	(-1.078)	(-0.892)
MON	-0.118b	-0.121a	-0.075b	-0.064b	-0.057c	-0.073b	-0.101a	-0.113a	-0.114a	-0.140a
	(-2.447)	(-3.636)	(-2.429)	(-2.041)	(-1.921)	(-2.374)	(-3.347)	(-3.770)	(-3.571)	(-4.112)
Tax	0.469a	0.1510	0.1080	0.1480	0.0480	0.0980	0.233c	0.0640	-0.0050	-0.0010
	(2.595)	(0.978)	(0.718)	(1.110)	(0.352)	(0.660)	(1.866)	(0.565)	(-0.038)	(-0.009)
R(-1)	-0.0070	0.0160	-0.0160	0.0000	0.0180	0.0230	0.030	0.0160	0.0280	0.052a
	(-0.318)	(0.738)	(-0.531)	(0.007)	(0.735)	(0.966)	(1.227)	(0.712)	(1.477)	(2.647)
Adj-R <sup>2</sup>	0.001	0.002	0.001	0.001	0.001	0.001	0.003	0.002	0.002	0.004

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A4: Ten Size Portfolios with the 8th highest B/M ratio*

<b>Panel A: Full sample (1926:07-2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.078a	0.072a	0.059a	0.065a	0.053a	0.061a	0.046a	0.054a	0.046a	0.048a
	(4.961)	(5.192)	(4.456)	(5.354)	(4.694)	(5.702)	(4.521)	(5.214)	(4.625)	(4.437)
SAD	-0.035b	-0.035a	-0.021c	-0.022b	-0.029a	-0.020b	-0.026a	-0.018c	-0.021b	-0.018c
	(-2.246)	(-2.779)	(-1.757)	(-2.004)	(-2.892)	(-2.121)	(-2.941)	(-1.959)	(-2.305)	(-1.881)
FALL	-0.0160	-0.0250	-0.0040	-0.0170	-0.0150	-0.0110	-0.0110	-0.0050	-0.0030	-0.0020
	(-0.805)	(-1.610)	(-0.294)	(-1.257)	(-1.184)	(-0.971)	(-0.950)	(-0.408)	(-0.275)	(-0.169)
MON	-0.255a	-0.190a	-0.125a	-0.164a	-0.156a	-0.126a	-0.120a	-0.125a	-0.118a	-0.114a
	(-7.877)	(-6.613)	(-4.895)	(-7.177)	(-7.143)	(-5.888)	(-5.674)	(-5.954)	(-5.678)	(-4.919)
Tax	0.230c	0.1640	0.259b	0.175b	0.1580c	0.164b	0.1010	0.0940	0.0200	0.0240
	(1.789)	(1.530)	(2.510)	(2.163)	(1.934)	(2.145)	(1.230)	(1.042)	(0.268)	(0.278)
R(-1)	0.0100	0.0120	0.0010	0.0190	0.0540a	0.048a	0.081a	0.063a	0.081a	0.079a
	(0.717)	(0.916)	(0.061)	(1.488)	(3.436)	(3.003)	(6.044)	(4.417)	(6.255)	(6.903)
Adj-R <sup>2</sup>	0.003	0.002	0.001	0.003	0.005	0.004	0.008	0.005	0.008	0.007

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel B: Subsample (1926:07-1973:12)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.115a (4.792)	0.102a (4.526)	0.085a (3.950)	0.093a (4.809)	0.082a (4.742)	0.084a (5.221)	0.066a (4.516)	0.075a (4.902)	0.065a (4.842)	0.077a (5.386)
SAD	-0.038c (-1.678)	-0.038c (-1.957)	-0.0280 (-1.575)	-0.0190 (-1.127)	-0.036b (-2.529)	-0.0130 (-1.007)	-0.023c (-1.887)	-0.0140 (-1.122)	-0.0160 (-1.404)	-0.0100 (-0.875)
FALL	-0.0230 (-0.754)	-0.0350 (-1.451)	-0.0220 (-0.976)	-0.0290 (-1.427)	-0.034c (-1.843)	-0.0130 (-0.759)	-0.0180 (-1.158)	-0.0120 (-0.732)	-0.0060 (-0.338)	-0.0010 (-0.080)
MON	-0.526a (-10.664)	-0.373a (-8.131)	-0.285a (-6.912)	-0.320a (-8.868)	-0.306a (-9.462)	-0.263a (-8.450)	-0.253a (-8.075)	-0.262a (-8.521)	-0.264a (-9.003)	-0.287a (-9.280)
Tax	0.625a (3.807)	0.458a (2.811)	0.486a (3.091)	0.324a (2.680)	0.285a (2.606)	0.352a (3.490)	0.290a (2.956)	0.298b (2.394)	0.163c (1.956)	0.166c (1.808)
$R(-1)$	0.0050 (0.283)	0.0180 (1.159)	0.0030 (0.164)	0.0110 (0.653)	0.063a (3.184)	0.045b (2.115)	0.099a (6.064)	0.066a (3.245)	0.103a (6.461)	0.090a (5.643)
Adj- $R^2$	0.010	0.006	0.004	0.007	0.011	0.008	0.016	0.01	0.018	0.015

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:12-2020:06)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.074a (3.826)	0.062a (3.940)	0.058a (3.9300)	0.050a (3.655)	0.039a (2.765)	0.063a (4.534)	0.050a (3.726)	0.060a (4.479)	0.054a (3.858)	0.068a (4.146)
SAD	-0.0310 (-1.473)	-0.027c (-1.673)	-0.0190 (-1.2520)	-0.031b (-2.332)	-0.029b (-2.059)	-0.027b (-1.986)	-0.029b (-2.185)	-0.024b (-1.777)	-0.028b (-1.966)	-0.036b (-2.177)
FALL	-0.0260 (-0.985)	-0.0170 (-0.907)	-0.0020 (-0.1150)	-0.015 (-0.910)	-0.0070 (-0.426)	-0.0160 (-0.974)	-0.0080 (-0.460)	-0.0040 (-0.263)	-0.0090 (-0.501)	-0.0200 (-0.917)
MON	-0.171a (-3.427)	-0.105a (-3.081)	-0.096a (-3.0680)	-0.092a (-3.025)	-0.096a (-3.057)	-0.117a (-3.954)	-0.119a (-4.087)	-0.135a (-4.406)	-0.123a (-3.965)	-0.206a (-5.578)
Tax	0.2990 (1.512)	0.258c (1.690)	0.1750 (1.2660)	0.156 (0.930)	0.0700 (0.498)	0.1700 (1.288)	0.1250 (0.994)	0.0790 (0.629)	0.1000 (0.856)	0.0130 (0.094)
$R(-1)$	0.0200 (0.791)	0.0020 (0.064)	-0.0010 (-0.0350)	0.038c (1.908)	0.042c (1.652)	0.054b (2.324)	0.058a (2.756)	0.061a (3.152)	0.059a (3.108)	0.072a (4.473)
Adj- $R^2$	0.002	0.001	0.001	0.003	0.003	0.005	0.005	0.006	0.005	0.008

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A5: Ten Size Portfolios with the 7th highest B/M ratio*

<b>Panel A: Full sample (1926:07-2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
<b>C<sub>0</sub></b>	0.083a (4.407)	0.079a (4.392)	0.063a (4.917)	0.065a (4.721)	0.048a (4.144)	0.050a (4.535)	0.051a (4.859)	0.044a (4.325)	0.050a (4.659)	0.047a (4.033)
<b>SAD</b>	-0.056a (-3.322)	-0.0220 (-1.448)	-0.029b (-2.519)	-0.027b (-2.314)	-0.032a (-3.003)	-0.028a (-2.916)	-0.023b (-2.363)	-0.027a (-2.954)	-0.020b (-2.134)	-0.023b (-2.203)
<b>FALL</b>	-0.056a (-2.820)	-0.0180 (-0.975)	-0.0130 (-0.951)	-0.0170 (-1.226)	-0.0190 (-1.424)	-0.023b (-1.929)	-0.0120 (-1.059)	-0.0190 (-1.603)	-0.0080 (-0.695)	-0.0040 (-0.318)
<b>MON</b>	-0.241a (-6.597)	-0.173a (-5.156)	-0.176a (-7.030)	-0.148a (-5.951)	-0.136a (-6.127)	-0.120a (-5.387)	-0.124a (-5.975)	-0.118a (-5.928)	-0.127a (-5.688)	-0.107a (-4.513)
<b>Tax</b>	0.1670 (1.123)	0.270c (1.725)	0.265b (2.544)	0.260a (2.639)	0.145c (1.938)	0.1120 (1.464)	0.0860 (1.044)	0.1130 (1.455)	0.1060 (1.394)	0.0480 (0.471)
<b>R(-1)</b>	0.0130 (0.926)	-0.0200 (-0.860)	0.055a (4.550)	0.0260 (1.312)	0.065a (4.083)	0.069a (4.862)	0.089a (6.183)	0.067a (3.674)	0.078a (5.601)	0.082a (6.661)
<b>Adj-R<sup>2</sup></b>	0.003	0.002	0.006	0.003	0.006	0.006	0.009	0.006	0.008	0.008

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

<b>Panel B: Subsample (1926:07-1973:12)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
<b>C<sub>0</sub></b>	0.139a (4.378)	0.115a (3.752)	0.093a (4.570)	0.088a (3.911)	0.070a (3.934)	0.076a (4.562)	0.080a (5.185)	0.059a (3.933)	0.068a (4.362)	0.073a (4.495)
<b>SAD</b>	-0.051c (-1.860)	-0.0190 (-0.768)	-0.0220 (-1.218)	-0.0250 (-1.399)	-0.029c (-1.915)	-0.0220 (-1.577)	-0.0130 (-1.028)	-0.0190 (-1.544)	-0.0150 (-1.186)	-0.0160 (-1.142)
<b>FALL</b>	-0.070b (-2.176)	-0.0240 (-0.785)	-0.0140 (-0.624)	-0.0220 (-1.045)	-0.0250 (-1.351)	-0.0260 (-1.516)	-0.0180 (-1.142)	-0.0190 (-1.095)	-0.006 (-0.407)	-0.0020 (-0.081)
<b>MON</b>	-0.468a (-7.599)	-0.366a (-6.329)	-0.338a (-8.520)	-0.307a (-7.636)	-0.297a (-8.943)	-0.265a (-7.908)	-0.277a (-9.264)	-0.247a (-8.475)	-0.280a (-8.507)	-0.279a (-8.376)
<b>Tax</b>	0.605a (2.742)	0.626a (2.268)	0.560a (3.581)	0.501a (3.236)	0.290a (2.729)	0.280a (2.841)	0.278a (2.785)	0.230b (2.317)	0.193b (2.133)	0.250c (1.914)
<b>R(-1)</b>	0.0080 (0.409)	-0.034a (-1.248)	0.064a (4.335)	0.0190 (0.744)	0.087a (4.876)	0.078a (4.418)	0.103a (6.583)	0.069a (2.580)	0.091a (5.244)	0.072a (4.272)
<b>Adj-R<sup>2</sup></b>	0.006	0.005	0.011	0.006	0.014	0.012	0.017	0.01	0.015	0.011

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:12-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.068a (4.146)	0.066a (4.236)	0.050a (3.575)	0.061a (4.293)	0.055a (3.894)	0.060a (4.306)	0.048a (3.497)	0.056a (4.294)	0.066a (4.720)	0.069a (4.393)
SAD	-0.036b (-2.177)	-0.0210 (-1.389)	-0.040a (-2.851)	-0.029b (-2.213)	-0.039a (-2.791)	-0.034a (-2.606)	-0.034b (-2.453)	-0.042a (-3.107)	-0.036b (-2.521)	-0.038b (-2.393)
FALL	-0.0200 (-0.917)	-0.0180 (-0.959)	-0.0270 (-1.597)	-0.0180 (-1.100)	-0.0240 (-1.381)	-0.028c (-1.661)	-0.0130 (-0.746)	-0.033c (-1.887)	-0.0270 (-1.488)	-0.0240 (-1.183)
MON	-0.206a (-5.578)	-0.120a (-3.549)	-0.111a (-3.637)	-0.102a (-3.315)	-0.123a (-3.930)	-0.159a (-5.167)	-0.115a (-3.766)	-0.132a (-4.579)	-0.164a (-5.344)	-0.203a (-5.784)
Tax	0.0130 (0.094)	0.323b (2.012)	0.2070 (1.356)	0.2170 (1.471)	0.1330 (0.960)	0.2150 (1.406)	0.1420 (1.020)	0.0490 (0.406)	0.0440 (0.344)	-0.0480 (-0.369)
R(-1)	0.072a (4.473)	0.039b (2.004)	0.038c (1.829)	0.043c (1.765)	0.0320 (1.157)	0.057b (2.483)	0.072a (2.895)	0.066a (2.975)	0.062a (2.906)	0.095a (5.284)
Adj-R <sup>2</sup>	0.008	0.003	0.004	0.004	0.003	0.007	0.007	0.007	0.007	0.012

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A6: Ten Size Portfolios with the 6th highest B/M ratio*

**Panel A: Full sample (1926:07-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.083a (4.598)	0.069a (4.516)	0.062a (4.918)	0.055a (4.801)	0.050a (4.592)	0.052a (4.368)	0.054a (4.992)	0.045a (3.885)	0.047a (3.815)	0.027b (2.067)
SAD	-0.060a (-3.364)	-0.031b (-2.307)	-0.028b (-2.445)	-0.028a (-2.594)	-0.030a (-2.995)	-0.031a (-2.848)	-0.033a (-3.184)	-0.037a (-3.548)	-0.023b (-2.196)	-0.041a (-2.963)
FALL	-0.048b (-2.275)	-0.0220 (-1.424)	-0.0220 (-1.530)	-0.0120 (-0.911)	-0.020c (-1.667)	-0.0180 (-1.383)	-0.022c (-1.772)	-0.0180 (-1.416)	-0.0120 (-0.911)	-0.0260 (-1.575)
MON	-0.184a (-5.021)	-0.168a (-6.333)	-0.145a (-5.646)	-0.102a (-4.483)	-0.112a (-5.115)	-0.095a (-3.298)	-0.139a (-6.297)	-0.103a (-4.712)	-0.100a (-4.307)	-0.085a (-3.143)
Tax	0.302b (2.181)	0.295a (2.794)	0.247b (2.508)	0.217b (2.373)	0.157c (1.835)	0.145c (1.829)	0.0580 (0.727)	0.0730 (0.821)	0.208b (2.381)	0.0800 (0.779)
R(-1)	-0.0200 (-1.533)	0.0150 (1.040)	0.064a (3.813)	0.037c (1.929)	0.055a (3.332)	0.0070 (0.146)	0.087a (5.995)	0.045a (2.691)	0.035c (1.702)	0.042a (2.751)
Adj-R <sup>2</sup>	0.002	0.002	0.006	0.003	0.005	0.001	0.01	0.003	0.002	0.002

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).



**Panel B: Subsample (1926:07-1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.122a (4.129)	0.098a (3.886)	0.094a (4.753)	0.076a (4.276)	0.069a (4.268)	0.078a (4.145)	0.082a (5.002)	0.067a (3.881)	0.066a (3.565)	0.053a (2.735)
SAD	-0.063b (-2.182)	-0.0210 (-0.995)	-0.030c (-1.740)	-0.0250 (-1.562)	-0.032b (-2.180)	-0.0220 (-1.406)	-0.032b (-2.139)	-0.031b (-2.113)	-0.0160 (-1.136)	-0.037c (-1.800)
FALL	-0.068b (-1.966)	-0.0330 (-1.371)	-0.036 (-1.634)	-0.0170 (-0.815)	-0.031c (-1.839)	-0.0150 (-0.812)	-0.0280 (-1.540)	-0.0260 (-1.444)	-0.0100 (-0.566)	-0.0350 (-1.416)
MON	-0.389a (-6.403)	-0.313a (-7.528)	-0.330a (-8.192)	-0.230a (-6.480)	-0.240a (-7.165)	-0.227a (-4.476)	-0.315a (-9.541)	-0.247a (-7.584)	-0.236a (-6.847)	-0.245a (-5.988)
Tax	0.494b (2.369)	0.600a (3.820)	0.465a (3.031)	0.486a (3.408)	0.357a (3.123)	0.319a (2.895)	0.202c (1.830)	0.264b (2.202)	0.421a (3.640)	0.328b (2.543)
R(-1)	-0.0270 (-1.603)	0.0180 (1.125)	0.090a (5.180)	0.0350 (1.360)	0.084a (4.987)	-0.0010 (-0.020)	0.1090 (8.055)	0.039c (1.711)	0.0200 (0.684)	0.0060 (0.256)
Adj-R <sup>2</sup>	0.005	0.005	0.015	0.006	0.013	0.004	0.020	0.007	0.005	0.004

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:01-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.077a (3.920)	0.059a (3.767)	0.057a (3.888)	0.062a (4.574)	0.054a (3.921)	0.052a (3.867)	0.061a (4.522)	0.059a (4.100)	0.064a (4.211)	0.059a (3.548)
SAD	-0.064a (-3.268)	-0.044a (-2.735)	-0.033b (-2.264)	-0.036a (-2.608)	-0.030b (-2.126)	-0.043a (-3.113)	-0.037a (-2.710)	-0.049a (-3.282)	-0.039b (-2.547)	-0.049a (-2.803)
FALL	-0.056b (-2.287)	-0.0230 (-1.157)	-0.0190 (-1.052)	-0.0230 (-1.364)	-0.0140 (-0.861)	-0.034b (-2.004)	-0.027 (-1.635)	-0.0230 (-1.27)	-0.0310 (-1.601)	-0.0290 (-1.263)
MON	-0.160a (-3.984)	-0.126a (-3.880)	-0.113a (-4.033)	-0.124a (-4.245)	-0.107a (-3.676)	-0.107a (-3.768)	-0.145a (-5.214)	-0.157a (-5.059)	-0.160a (-4.940)	-0.240a (-6.525)
Tax	0.360b (2.005)	0.266c (1.789)	0.0960 (0.865)	0.1080 (0.843)	0.1610 (1.311)	0.1550 (1.169)	0.0890 (0.706)	0.0200 (0.144)	0.0770 (0.586)	-0.0150 (-0.096)
R(-1)	0.0000 (-0.026)	0.0110 (0.355)	0.0100 (1.091)	0.0440 (1.537)	0.0130 (0.446)	0.0260 (0.875)	0.055c (1.958)	0.054b (2.366)	0.057b (2.198)	0.097a (5.596)
Adj-R <sup>2</sup>	0.003	0.003	0.002	0.004	0.002	0.003	0.006	0.006	0.006	0.013

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A7: Ten Size Portfolios with the 5th highest B/M ratio*

**Panel A: Full sample (1926:07-2020:06)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.072a (3.535)	0.073a (4.843)	0.059a (4.853)	0.059a (4.926)	0.060a (5.255)	0.056a (4.762)	0.065a (5.388)	0.049a (4.163)	0.051a (4.106)	0.035b (2.315)
SAD	-0.034c (-1.870)	-0.038a (-2.853)	-0.033a (-3.048)	-0.033a (-3.223)	-0.031a (-2.797)	-0.02c (-1.891)	-0.029a (-2.713)	-0.028a (-2.727)	-0.031a (-2.766)	-0.023c (-1.649)
FALL	-0.033 (-1.541)	-0.033c (-1.942)	-0.035a (-2.650)	-0.025c (-1.927)	-0.027b (-2.016)	-0.0130 (-1.046)	-0.0150 (-1.166)	-0.0170 (-1.257)	-0.0150 (-1.122)	-0.0020 (-0.136)
MON	-0.179a (-4.187)	-0.165a (-5.865)	-0.118a (-4.925)	-0.140a (-5.992)	-0.128a (-5.424)	-0.125a (-5.667)	-0.135a (-5.775)	-0.123a (-5.425)	-0.141a (-5.742)	-0.089a (-3.045)
Tax	0.525a (3.000)	0.321a (2.663)	0.254a (2.996)	0.357a (3.953)	0.198b (2.183)	0.240a (2.600)	0.239a (2.648)	0.240a (2.606)	0.195c (1.826)	0.1960 (1.414)
$R(-1)$	-0.0090 (-0.377)	-0.0050 (-0.288)	0.039b (2.221)	0.047b (2.104)	0.0180 (1.156)	0.043a (2.653)	0.059a (4.081)	0.046a (3.177)	0.057a (3.643)	0.0020 (0.084)
Adj- $R^2$	0.002	0.002	0.003	0.005	0.002	0.004	0.006	0.004	0.005	0.001

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel B: Subsample (1926:07-1973:12)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.114a (3.292)	0.102a (4.090)	0.082a (4.342)	0.077a (4.248)	0.074a (4.165)	0.078a (4.382)	0.094a (5.244)	0.069a (4.031)	0.081a (4.391)	0.073a (3.131)
SAD	-0.0330 (-1.149)	-0.042b (-2.042)	-0.031c (-1.953)	-0.030b (-2.084)	-0.040b (-2.385)	-0.0180 (-1.217)	-0.0200 (-1.327)	-0.025c (-1.702)	-0.0210 (-1.354)	-0.0080 (-0.368)
FALL	-0.062c (-1.851)	-0.052c (-1.951)	-0.050b (-2.567)	-0.0290 (-1.529)	-0.036c (-1.828)	-0.0180 (-1.023)	-0.0220 (-1.127)	-0.0190 (-0.969)	-0.0070 (-0.393)	0.0020 (0.060)
MON	-0.392a (-5.337)	-0.335a (-7.270)	-0.261a (-6.947)	-0.313a (-8.823)	-0.284a (-7.582)	-0.281a (-8.408)	-0.305a (-8.727)	-0.285a (-8.585)	-0.326a (-9.101)	-0.268a (-5.933)
Tax	1.017a (3.425)	0.648a (3.293)	0.481a (3.936)	0.684a (5.318)	0.353b (2.571)	0.490a (3.705)	0.473a (3.584)	0.542a (4.282)	0.423a (2.864)	0.475a (2.723)
$R(-1)$	-0.0210 (-0.730)	-0.0140 (-0.636)	0.057a (2.720)	0.073b (2.342)	0.030c (1.686)	0.057a (3.130)	0.070a (4.165)	0.054a (3.160)	0.064a (3.174)	-0.045a (-5.126)
Adj- $R^2$	0.005	0.006	0.009	0.014	0.007	0.010	0.012	0.011	0.011	0.005

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:01-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
$C_0$	0.072a (3.747)	0.069a (4.519)	0.059a (4.003)	0.067a (4.685)	0.077a (5.552)	0.062a (4.230)	0.066a (4.510)	0.064a (4.348)	0.065a (4.206)	0.057a (3.331)
SAD	-0.0290 (-1.463)	-0.033b (-2.161)	-0.041a (-2.852)	-0.044a (-3.148)	-0.026c (-1.885)	-0.029c (-1.942)	-0.046a (-3.030)	-0.038b (-2.499)	-0.049a (-3.015)	-0.043b (-2.347)
FALL	-0.0110 (-0.449)	-0.0210 (-1.073)	-0.0310 (-1.744)	-0.034b (-2.015)	-0.030c (-1.800)	-0.0220 (-1.204)	-0.0260 (-1.371)	-0.0300 (-1.547)	-0.042b (-2.070)	-0.0230 (-0.986)
MON	-0.183a (-4.573)	-0.132a (-4.008)	-0.098a (-3.216)	-0.106a (-3.604)	-0.126a (-4.508)	-0.120a (-4.217)	-0.133a (-4.251)	-0.151a (-4.854)	-0.186a (-5.551)	-0.238a (-6.468)
Tax	0.373b (2.143)	0.230b (1.548)	0.1720 (1.388)	0.0530 (0.370)	0.1590 (1.142)	0.1280 (0.926)	0.1350 (1.006)	0.0440 (0.316)	0.0850 (0.614)	0.0850 (0.591)
$R(-1)$	0.0330 (1.485)	0.021b (0.801)	0.0070 (0.249)	0.0030 (0.126)	-0.0020 (-0.074)	0.0240 (0.824)	0.045c (1.809)	0.0370 (1.540)	0.051b (2.144)	0.090a (5.152)
Adj- $R^2$	0.004	0.003	0.002	0.002	0.002	0.002	0.005	0.004	0.006	0.012

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A8: Ten Size Portfolios with the 4th highest B/M ratio*

**Panel A: Full sample (1926:07-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
$C_0$	0.057a (2.674)	0.081a (5.784)	0.056a (4.364)	0.064a (5.060)	0.061a (5.021)	0.055a (4.094)	0.054a (4.178)	0.054a (4.123)	0.057a (3.765)	0.033c (1.914)
SAD	-0.069a (-3.372)	-0.036a (-2.68)	-0.032a (-2.820)	-0.029b (-2.653)	-0.026b (-2.309)	-0.034a (-2.836)	-0.035a (-3.102)	-0.027b (-2.331)	-0.033b (-2.422)	-0.025c (-1.676)
FALL	-0.079a (-3.302)	-0.043a (-2.681)	-0.023c (-1.679)	-0.0220 (-1.643)	-0.023c (-1.711)	-0.027c (-1.893)	-0.028b (-2.035)	-0.0150 (-1.047)	-0.0230 (-1.418)	0.0020 (0.125)
MON	-0.097b (-2.572)	-0.154a (-5.687)	-0.132a (-5.333)	-0.137a (-5.788)	-0.126a (-5.184)	-0.116a (-4.547)	-0.115a (-4.894)	-0.118a (-4.95)	-0.137a (-4.477)	-0.071c (-1.956)
Tax	0.273b (2.198)	0.383a (3.394)	0.342a (3.200)	0.368a (3.566)	0.200b (2.355)	0.191c (1.879)	0.199b (2.226)	0.226a (2.712)	0.240b (2.305)	0.315a (2.598)
$R(-1)$	-0.0740 (-2.835)	0.042a (2.869)	0.049a (2.983)	0.0190 (0.777)	0.044a (2.601)	0.0150 (0.892)	0.030b (2.020)	0.0020 (0.104)	-0.0040 (-0.071)	-0.087a (-3.618)
Adj- $R^2$	0.006	0.004	0.005	0.003	0.003	0.002	0.002	0.001	0.001	0.008

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

<b>Panel B: Subsample (1926:07-1973:12)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.081a (4.391)	0.113a (5.148)	0.079a (4.022)	0.091a (4.661)	0.085a (4.462)	0.081a (3.793)	0.075a (3.842)	0.086a 4.2450	0.093a (3.744)	0.061b (2.135)
SAD	-0.0210 (-1.354)	-0.040c (-1.916)	-0.028c (-1.699)	-0.0280 (-1.488)	-0.031c (-1.864)	-0.033c (-1.831)	-0.032c (-1.943)	-0.0180 -1.0510	-0.0280 (-1.336)	-0.0150 (-0.641)
FALL	-0.0070 (-0.393)	-0.072a (-2.903)	-0.0330 (-1.631)	-0.0310 (-1.357)	-0.043b (-2.125)	-0.038c (-1.762)	-0.039c (-1.947)	-0.0140 -0.6480	-0.0310 (-1.264)	0.0130 (0.447)
MON	-0.326a (-9.101)	-0.319a (-7.416)	-0.291a (-7.663)	-0.314a (-8.318)	-0.273a (-7.103)	-0.278a (-6.803)	-0.253a (-7.042)	-0.287a -8.0230	-0.311a (-6.010)	-0.227a (-3.600)
Tax	0.423a (2.864)	0.727a (4.002)	0.712a (4.493)	0.757a (5.179)	0.383a (3.164)	0.428a (2.666)	0.455a (3.584)	0.468a 4.2830	0.521a (3.290)	0.639a (4.179)
R(-1)	0.064a (3.174)	0.055a (3.237)	0.078a (4.607)	0.035a (3.972)	0.068a (3.451)	0.0170 (0.858)	0.045b (2.577)	-0.0210 -0.694	-0.0270 (-0.389)	-0.144a (-5.166)
Adj- R <sup>2</sup>	0.011	0.010	0.013	0.009	0.010	0.005	0.00	0.006	0.004	0.023

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NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

<b>Panel C: Subsample (1974:01-2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.050b (2.538)	0.071a (4.597)	0.062a (4.152)	0.068a (4.688)	0.062a (4.462)	0.060a (4.217)	0.069a (4.458)	0.064a (4.288)	0.057a (3.592)	0.068a (4.016)
SAD	-0.051b (-2.443)	-0.037b (-2.424)	-0.042a (-2.784)	-0.033b (-2.332)	-0.0220 (-1.554)	-0.034b (-2.399)	-0.040a (-2.692)	-0.040a (-2.638)	-0.046a (-2.886)	-0.040b (-2.262)
FALL	-0.058b (-2.227)	-0.0260 (-1.374)	-0.0290 (-1.541)	-0.0230 (-1.295)	-0.0100 (-0.573)	-0.0210 (-1.203)	-0.0270 (-1.434)	-0.0250 (-1.296)	-0.035c (-1.711)	-0.0250 (-1.100)
MON	-0.151a (-3.521)	-0.115a (-3.545)	-0.126a (-4.027)	-0.119a (-4.195)	-0.108a (-3.841)	-0.124a (-4.288)	-0.167a (-5.384)	-0.18a (-5.824)	-0.169a (-5.156)	-0.263a (-7.384)
Tax	0.418b (2.440)	0.2260 (1.538)	0.1360 (0.978)	0.1890 (1.429)	0.1530 (1.151)	0.1340 (0.940)	0.1430 (0.995)	0.0970 (0.680)	0.0370 (0.255)	0.0930 (0.688)
R(-1)	0.040c (1.663)	0.0120 (0.477)	-0.0040 (-0.136)	-0.0140 (-0.524)	-0.0030 (-0.096)	0.0110 (0.437)	0.0080 (0.307)	0.047a (1.974)	0.072a (3.489)	0.090a (4.010)
Adj- R <sup>2</sup>	0.004	0.002	0.002	0.002	0.001	0.002	0.003	0.006	0.008	0.013

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A9: Ten Size Portfolios with the 3th highest B/M ratio*

**Panel A: Full sample (1926:07-2020:06)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.064a (3.724)	0.072a (5.249)	0.049a (3.787)	0.060a (4.497)	0.054a (3.963)	0.054a (4.287)	0.067a (4.548)	0.030b (2.318)	0.053a (2.949)	0.0310 (1.519)
SAD	-0.070a (-4.379)	-0.039a (-3.157)	-0.035a (-2.828)	-0.030b (-2.543)	-0.050a (-4.000)	-0.042a (-3.522)	-0.029b (-2.129)	-0.056a (-4.418)	-0.0250 (-1.481)	-0.049b (-2.379)
FALL	-0.067a (-3.517)	-0.042a (-2.815)	-0.028c (-1.857)	-0.027c (-1.945)	-0.041a (-2.737)	-0.032b (-2.043)	-0.030c (-1.851)	-0.039b (-2.466)	-0.0170 (-0.812)	-0.0270 (-1.182)
MON	-0.213a (-6.171)	-0.135a (-4.730)	-0.109a (-4.340)	-0.117a (-4.524)	-0.111a (-4.224)	-0.146a (-6.003)	-0.122a (-4.194)	-0.106a (-4.060)	-0.082b (-2.162)	-0.093b (-2.449)
Tax	0.488a (3.443)	0.442a (4.473)	0.419a (3.441)	0.254a (2.855)	0.216c (1.900)	0.293b (2.270)	0.228b (2.336)	0.254a (2.632)	0.444a (2.643)	0.366b (2.130)
R(-1)	0.032b (2.043)	0.033b (2.220)	0.0190 (1.089)	0.051b (2.366)	-0.0160 (-0.741)	-0.0090 (-0.452)	-0.0070 (-0.303)	0.0070 (0.429)	-0.0450 (-1.622)	-0.095a (-3.486)
Adj-R <sup>2</sup>	0.005	0.004	0.002	0.004	0.002	0.003	0.001	0.002	0.003	0.010

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel B: Subsample (1926:07-1973:12)**

	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.102a (3.700)	0.102a (3.700)	0.068a (3.315)	0.087a (4.101)	0.068a (3.166)	0.077a (3.927)	0.106a (4.326)	0.108a (4.319)	0.081a (2.695)	0.084b (2.444)
SAD	-0.074a (-2.948)	-0.074a (-2.948)	-0.033c (-1.771)	-0.0230 (-1.276)	-0.056a (-2.855)	-0.041b (-2.316)	-0.0110 (-0.532)	-0.0130 (-0.617)	-0.0070 (-0.247)	-0.0410 (-1.157)
FALL	-0.089a (-2.969)	-0.089a (-2.969)	-0.0370 (-1.605)	-0.040c (-1.953)	-0.063a (-2.637)	-0.045c (-1.892)	-0.0350 (-1.395)	-0.0370 (-1.456)	-0.0220 (-0.661)	-0.0330 (-0.864)
MON	-0.450a (-8.073)	-0.450a (-8.073)	-0.248a (-6.256)	-0.273a (-6.641)	-0.244a (-5.575)	-0.307a (-8.140)	-0.261a (-5.300)	-0.270a (-5.406)	-0.214a (-3.190)	-0.290a (-4.434)
Tax	1.026a (4.774)	1.026a (4.774)	0.812a (4.161)	0.489a (3.826)	0.535a (2.929)	0.624a (2.940)	0.534a (3.831)	0.516a (3.647)	0.923a (3.303)	0.683b (2.308)
R(-1)	0.039b (2.182)	0.039b (2.182)	0.036c (1.737)	0.083a (3.172)	-0.0190 (-0.740)	-0.0140 (-0.500)	-0.0120 (-0.405)	-0.0120 (-0.400)	-0.075b (-2.228)	-0.141a (-4.448)
Adj-R <sup>2</sup>	0.010	0.010	0.007	0.011	0.005	0.007	0.003	0.003	0.007	0.022

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:01-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.066a (3.633)	0.066a (4.313)	0.060a (4.090)	0.064a (4.455)	0.068a (4.658)	0.062a (4.153)	0.060b (3.985)	0.064a (4.055)	0.068a (4.113)	0.049a (2.699)
SAD	-0.061a (-3.348)	-0.050a (-3.335)	-0.040a (-2.701)	-0.044a (-2.921)	-0.043a (-3.008)	-0.045a (-3.083)	-0.048a (-3.235)	-0.058a (-3.579)	-0.047a (-2.653)	-0.058a (-3.017)
FALL	-0.056b (-2.474)	-0.039b (-2.099)	-0.0280 (-1.499)	-0.0210 (-1.119)	-0.0280 (-1.548)	-0.0290 (-1.565)	-0.037b (-1.907)	-0.036c (-1.706)	-0.0270 (-1.213)	-0.0370 (-1.553)
MON	-0.184a (-5.083)	-0.129a (-4.132)	-0.119a (-4.136)	-0.128a (-4.416)	-0.13a (-4.563)	-0.145a (-4.84)	-0.144 (-4.658)	-0.171a (-5.130)	-0.199a (-5.629)	-0.271a (-7.004)
Tax	0.433a (2.635)	0.1820 (1.353)	0.1890 (1.312)	0.1790 (1.364)	0.1950 (1.366)	0.1980 (1.309)	0.1690 (1.059)	0.0220 (0.155)	0.1060 (0.727)	0.1620 (1.012)
R(-1)	0.0170 (0.573)	0.0050 (0.215)	-0.0150 (-0.489)	-0.0200 (-0.749)	-0.0040 (-0.129)	0.0020 (0.068)	0.0080 (0.341)	0.049b (2.167)	0.068a (3.097)	0.080a (4.427)
Adj-R <sup>2</sup>	0.005	0.003	0.002	0.003	0.003	0.003	0.003	0.006	0.008	0.012

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A10: Ten Size Portfolios with the 2th highest B/M ratio*

**Panel A: Full sample (1926:07-2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.068a (4.297)	0.066a (4.815)	0.055a (3.894)	0.067a (4.585)	0.054a (3.257)	0.079a (3.895)	0.036c (1.834)	0.074a (2.839)	0.042b (2.086)	0.0340 (1.543)
SAD	-0.068a (-4.374)	-0.049a (-3.829)	-0.044a (-3.411)	-0.040a (-2.739)	-0.045a (-3.085)	-0.048b (-2.340)	-0.058a (-3.060)	-0.045c (-1.931)	-0.076a (-3.656)	-0.051b (-2.529)
FALL	-0.076a (-4.008)	-0.051a (-3.251)	-0.043a (-2.645)	-0.048a (-2.691)	-0.049a (-2.729)	-0.061b (-2.492)	-0.052b (-2.478)	-0.043 (-1.415)	-0.065b (-2.453)	-0.020 (-0.815)
MON	-0.179a (-6.133)	-0.136a (-5.406)	-0.093a (-3.781)	-0.131a (-4.688)	-0.121a (-4.105)	-0.094a (-2.827)	-0.075c (-1.851)	-0.15a (-2.856)	-0.104b (-2.479)	-0.144a (-3.685)
Tax	0.608a (4.369)	0.398a (3.229)	0.502a (3.379)	0.496a (3.722)	0.508a (4.055)	0.430b (2.564)	0.666b (2.459)	0.678a (3.106)	0.638b (2.512)	0.697a (3.086)
R(-1)	0.0140 (0.823)	0.0270 (1.516)	0.0010 (0.053)	-0.074c (-1.724)	-0.0320 (-1.643)	-0.125a (-2.678)	-0.104a (-4.304)	-0.189a (-6.597)	-0.174a (-6.991)	-0.056a (-3.434)
Adj-R <sup>2</sup>	0.005	0.004	0.002	0.008	0.003	0.017	0.012	0.037	0.032	0.005

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel B: Subsample (1926:07-1973:12)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.109a (4.345)	0.093a (4.356)	0.073a (3.300)	0.095a (3.965)	0.086a (3.099)	0.125a (3.473)	0.050 (1.467)	0.122b (2.537)	0.079a (2.298)	0.112a (2.704)
SAD	-0.073a (-3.044)	-0.055a (-2.912)	-0.042b (-2.194)	-0.0370 (-1.615)	-0.047c (-1.990)	-0.0370 (-1.083)	-0.062b (-1.976)	-0.0320 (-0.812)	-0.084b (-2.367)	-0.0400 (-1.133)
FALL	-0.110a (-3.771)	-0.071a (-3.033)	-0.057b (-2.311)	-0.066b (-2.330)	-0.078a (-2.700)	-0.08b0 (-1.930)	-0.086b (-2.545)	-0.0410 (-0.770)	-0.099b (-2.165)	-0.0200 (-0.452)
MON	-0.391a (-8.44)	-0.310a (-7.955)	-0.230a (-5.919)	-0.296a (-6.213)	-0.280a (-5.621)	-0.245a (-4.175)	-0.199a (-2.768)	-0.372a (-3.676)	-0.286a (-3.547)	-0.443a (-5.958)
Tax	1.166a (5.592)	0.785a (4.140)	0.984a (4.069)	0.943a (4.218)	0.971a (4.921)	0.914a (3.096)	1.317a (2.651)	1.256a (3.227)	1.378a (2.900)	1.466a (3.391)
R(-1)	0.0160 (0.765)	0.048b (2.196)	0.0230 (0.870)	-0.0810 (-1.511)	-0.0340 (-1.479)	-0.145a (-2.739)	-0.128a (-4.502)	-0.210a (-7.350)	-0.220a (-8.282)	-0.092a (-4.627)
Adj-R <sup>2</sup>	0.011	0.011	0.007	0.012	0.006	0.023	0.019	0.046	0.051	0.014

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

**Panel C: Subsample (1974:01- 2020:06)**

	BM10	BM9	BM8	BM7	BM6	BM5	BM4	BM3	BM2	BM1
C <sub>0</sub>	0.061a (3.569)	0.073a (4.802)	0.071a (4.564)	0.067a (4.444)	0.058a (3.832)	0.070a (4.530)	0.065a (3.975)	0.070a (4.322)	0.055a (3.091)	0.049a (2.676)
SAD	-0.058a (-3.210)	-0.041a (-2.533)	-0.045a (-2.844)	-0.045a (-2.827)	-0.042a (-2.791)	-0.050a (-3.261)	-0.048a (-2.744)	-0.051a (-2.933)	-0.054a (-3.062)	-0.052a (-2.803)
FALL	-0.047b (-2.156)	-0.036c (-1.828)	-0.0310 (-1.620)	-0.036c (-1.884)	-0.0220 (-1.168)	-0.039b (-2.074)	-0.0210 (-0.967)	-0.049b (-2.232)	-0.0330 (-1.525)	-0.0300 (-1.219)
MON	-0.144a (-4.216)	-0.142a (-4.822)	-0.136a (-4.561)	-0.121a (-4.286)	-0.157a (-5.313)	-0.164a (-5.428)	-0.190a (-5.848)	-0.190a (-5.617)	-0.204a (-5.768)	-0.303a (-8.195)
Tax	0.422a (2.596)	0.269b (1.988)	0.263c (1.765)	0.2280 (1.631)	0.289c (1.940)	0.273c (1.945)	0.274c (1.707)	0.2300 (1.548)	0.333b (2.069)	0.390b (2.431)
R(-1)	0.0100 (0.377)	-0.0140 (-0.491)	-0.0450 (-1.389)	-0.0490 (-1.425)	-0.023b (-0.707)	-0.0100 (-0.324)	0.0250 (0.837)	0.0340 (1.607)	0.062a (2.735)	0.076a (3.604)
Adj-R <sup>2</sup>	0.004	0.003	0.005	0.005	0.004	0.004	0.005	0.005	0.008	0.013

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

*Table A11: Ten Size Portfolios with the lowest B/M ratio*

<b>Panel A: Full sample (1926:07-2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.069a (4.633)	0.074a (4.705)	0.077a (3.824)	0.062a (3.269)	0.043b (2.228)	0.056b (2.273)	0.045b (2.359)	0.0320 (1.443)	0.101a (2.714)	0.060c (1.879)
SAD	-0.072a (-4.87)	-0.065a (-4.676)	-0.073a (-4.161)	-0.086a (-3.978)	-0.068a (-3.656)	-0.081a (-3.702)	-0.093a (-4.097)	-0.102a (-4.035)	-0.084a (-2.946)	-0.097a (-3.145)
FALL	-0.102a (-5.772)	-0.077a (-4.528)	-0.098a (-4.494)	-0.103a (-4.159)	-0.057b (-2.397)	-0.077a (-2.927)	-0.079a (-2.886)	-0.103a (-3.410)	-0.102a (-3.028)	-0.127a (-3.586)
MON	-0.185a (-6.870)	-0.137a (-5.136)	-0.092b (-2.500)	-0.091b (-2.566)	-0.0230 (-0.661)	-0.118a (-2.853)	-0.105a (-2.646)	-0.0390 (-0.811)	-0.0900 (-1.576)	-0.161a (-2.655)
Tax	0.805a (4.743)	0.656a (4.307)	0.587a (3.788)	0.315b (2.438)	0.546a (4.421)	0.355a (2.947)	0.479b (2.250)	0.512a (3.032)	0.706c (1.770)	1.032a (3.872)
$R(-1)$	0.055a (2.674)	-0.0320 (-1.427)	-0.142a (-3.886)	-0.094a (-3.149)	-0.123a (-4.338)	-0.166a (-3.185)	-0.124a (-4.282)	-0.137a (-4.763)	-0.243a (-7.617)	-0.176a (-4.769)
Adj- $R^2$	0.011	0.005	0.022	0.010	0.016	0.028	0.017	0.020	0.059	0.032

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

<b>Panel B: Subsample (1926:07-1973:12)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.111a (4.386)	0.117a (4.328)	0.124a (3.433)	0.096a (2.820)	0.064c (1.837)	0.094b (2.035)	0.083b (2.320)	0.069 (1.615)	0.239a (3.137)	0.196a (3.088)
SAD	-0.063a (-2.611)	-0.055b (-2.430)	-0.069b (-2.364)	-0.099a (-2.683)	-0.061c (-1.926)	-0.080b (-2.111)	-0.098b (-2.277)	-0.108b (-2.230)	-0.056 (-0.995)	-0.066 (-1.110)
FALL	-0.114a (-3.980)	-0.085a (-3.049)	-0.122a (-3.348)	-0.137a (-3.241)	-0.0480 (-1.159)	-0.0750 (-1.645)	-0.0750 (-1.470)	-0.116b (-2.057)	-0.108c (-1.659)	-0.122c (-1.827)
MON	-0.403a (-8.579)	-0.318a (-6.718)	-0.227a (-3.314)	-0.230a (-3.560)	-0.104 (-1.584)	-0.292a (-3.630)	-0.287a (-3.659)	-0.189b (-1.918)	-0.287b (-2.344)	-0.521a (-4.094)
Tax	1.444a (5.062)	1.180a (4.539)	1.052a (3.937)	0.526b (2.303)	0.940a (4.555)	0.604a (2.901)	0.919b (2.230)	0.986a (2.947)	1.429c (1.678)	2.011a (3.971)
$R(-1)$	0.042c (1.715)	-0.048c (-1.945)	-0.158a (-3.953)	-0.107a (-3.222)	-0.138a (-4.558)	-0.183a (-3.34)	-0.147a (-4.823)	-0.172a (-5.458)	-0.265a (-8.148)	-0.196a (-4.868)
Adj- $R^2$	0.016	0.010	0.028	0.014	0.020	0.034	0.024	0.031	0.071	0.041

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).



<b>Panel C: Subsample (1974:01-2020:06)</b>										
	<b>BM10</b>	<b>BM9</b>	<b>BM8</b>	<b>BM7</b>	<b>BM6</b>	<b>BM5</b>	<b>BM4</b>	<b>BM3</b>	<b>BM2</b>	<b>BM1</b>
$C_0$	0.066a (5.394)	0.066a (5.708)	0.062a (5.136)	0.069a (5.289)	0.063a (5.035)	0.062a (4.562)	0.057a (3.900)	0.061a (4.006)	0.052a (3.353)	0.051a (3.248)
SAD	-0.061a (-4.637)	-0.060a (-4.792)	-0.057a (-4.500)	-0.057a (-4.030)	-0.054a (-3.961)	-0.054a (-3.906)	-0.064a (-4.211)	-0.071a (-4.375)	-0.060a (-3.837)	-0.076a (-4.463)
FALL	-0.077a (-4.716)	-0.060a (-3.959)	-0.060a (-3.825)	-0.060a (-3.486)	-0.057a (-3.320)	-0.058a (-3.335)	-0.072a (-3.759)	-0.076a (-3.717)	-0.065a (-3.223)	-0.091a (-4.158)
MON	-0.173a (-7.212)	-0.159a (-7.389)	-0.152a (-6.595)	-0.173a (-7.018)	-0.169a (-6.991)	-0.191a (-7.244)	-0.177a (-6.312)	-0.238a (-7.524)	-0.249a (-7.891)	-0.361a (-11.19)
Tax	0.606a (5.074)	0.405a (3.565)	0.386a (3.362)	0.416a (3.451)	0.457a (3.710)	0.480a (3.684)	0.478a (3.514)	0.422a (3.072)	0.600a (4.457)	0.562a (3.736)
$R(-1)$	0.123a (4.112)	0.074c (1.957)	0.0250 (0.567)	0.0170 (0.366)	0.0470 (1.304)	0.071b (2.355)	0.068a (2.167)	0.115a (5.134)	0.125a (5.512)	0.145a (5.508)
Adj- $R^2$	0.030	0.017	0.010	0.009	0.012	0.014	0.013	0.023	0.026	0.037

NOTE: "a," "b" and "c" indicate statistical significance at the levels 1%, 5% and 10%, respectively. BM1 denotes the lowest decile group of portfolios with the lowest book-to-market ratio (i.e., growth stocks), while BM10 is highest decile portfolios with the highest book to-market ratio (i.e., value stocks).

