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Volume 31, Issue 6, 2022

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Publication of this issue 6/2022 of Economic Studies journal is supported by the Bulgarian National Science Fund at Ministry of Education and Science.

ECONOMIC RESEARCH INSTITUTE AT BULGARIAN ACADEMY OF SCIENCES

ECONOMIC STUDIES

Volume 31(6), 2022

To be cited as Economic Studies (Ikonomicheski Izsledvania), 31(6), 2022.

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ISSN 0205-3292

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Mariella Nenova¹

Volume 31(6), 2022

HOUSEHOLDS' CONSUMPTION PATTERN AND SAVING – EVIDENCE FOR THE FIRST YEAR OF THE COVID-19 PANDEMIC IN BULGARIA²

Households' saving jumped up in 2020 as a response to the outburst of the Covid-19 pandemic. The objective of the paper is to analyse the mechanism behind the hike in households' saving through the changes in their consumption pattern. The analysis makes use of the households' budget survey annual data for the period 2008-2020 for Bulgaria. Households' downward adjustment in spending in 2020 followed the pattern of 2009-2010, but the reduction was more pronounced in expenditures on recreation, culture, and education (related both to the Covid-19 restrictive government measures and self-restrain from consumption caused by enhanced health risk) and spending on health (self-restraint). A supposition may be drawn that the enhanced health risk perception and self-restraint might contribute to a relatively elevated saving rate. Subdued consumption of services, most affected by Covid-19 restrictive measures, might sustain at least in the near future and slow down the overall growth rate. Policy measures to boost consumption, particularly of services, may be ineffective. Keywords: Covid-19; disposable income; consumption; saving; income elasticity of demand

JEL: E21; E44; E52; I12; I18

1. Introduction

Disasters are part of the human being. They disrupt economic activity and the accustomed pattern of everyday life and induce resource reallocation. The unique nature of the Covid-19 disaster is that, contrary to most other catastrophes, it spread all around the world in a short time. The World Health Organization (WHO) received the first information about Covid-19 on December 31, 2019. On January 30, 2020, WHO declared the Covid-19 outbreak a Public

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² The presented results are part of a research project funded by the Sofia University "St. Kliment Ohridski", Sofia, Bulgaria, under Grant Agreement No 80-10-107/25.03.2021, project "The Bulgarian Economy in the first Year of the Covid-19 Pandemic – sectoral analyses and macroeconomic impact". This paper should be cited as: *Nenova*, *M.* (2022). *Households' Consumption Pattern and Saving – Evidence for the First Year of the Covid-19 Pandemic in Bulgaria. – Economic Studies (Ikonomicheski Izsledvania)*, 31(6), pp. 3-22.

Health Emergency of International Concern and invited authorities around the world to take notice and act immediately. And they did.

The restrictive measures undertaken by many governments to contain the spread of the disease caused a severe negative shock on the economy. The ups and downs in the Covid-19 progression and the corresponding tightening and softening of government measures to slow down the speed of infection transmission can be interpreted as a multi-period shock on the world economy (Ludvigson, 2021). The longer the Covid-19 pandemic lasts, the higher the accumulated costs (Ludvigson, 2021) and the short-term effects on the economy may have long-term consequences. To study the perceptions about the long-term effects of Covid-19 the European Central Bank (ECB) conducted an ad-hoc survey of leading euro area corporations. According to the summary of the results (Maqui, 2020), a significant share of respondents presumed persistent lower demand in the future. Data confirmed those expectations as household consumption shrank at the beginning of the pandemic and if the persistic expectations of the leading companies are realised, the high saving rate will persist.

The objective of the study is to outline the mechanism behind the hike in household saving through the changes in their consumption pattern. For that purpose, the empirical analysis utilises annual data on household consumption by the reported in the household budget survey for Bulgaria's ten expenditure groups. To judge about the specific impact of Covid-19 on saving and consumption pattern a comparison is made between changes in household consumption behaviour during the global economic crisis of 2008-2009 and the global health crisis in 2020. Recent academic literature distinguishes three layers embracing a hike in saving – precautionary saving due to growing job and income uncertainty present in every economic crisis period, and two Covid-19 pandemic specific layers, namely forced saving caused by restrictive government measures to contain the spread of infection and saving related to health risk-avoiding behaviour by consumers. The first task of the study is to relate changes in consumption by expenditure groups to any of the three layers of saving. The second task is to reveal changes in consumption pattern by income groups and to try to confirm a finding in the literature that it is higher-income households that increase their savings in the event of a negative shock by curtailing non-essential expenditures. The applied methodology is constrained by the time span of the available household budget survey data.

The next section of the paper presents a brief overview of recent publications on Covid-19 saving and consumption household behaviour. Section three provides a description of the household budget survey data for Bulgaria. Section four depicts the methodology applied in the study. Section five contains the core of the study – the estimation of a counterfactual consumption growth rate by each expenditure group. The empirical analysis of the differences between the reported and the counterfactual expenditure growth rates exposes in what if terms of the structural changes in consumption pattern in 2009-2010 and in 2020. Section six combines data by decile income groups and by expenditures to provide an aggregate portrayal of changes in consumption patterns by income groups in the two crisis periods. The last section summarises the findings and contemplates on possible policy implications.

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2. Household Saving and the Covid-19 Pandemic – Overview of Recent Literature

Studies of saving behaviour determinants in the period after the global financial and economic crisis of 2008-2009 and before the outbreak of the Covid-19 pandemic revealed a wide set of factors affecting saving (Loayza, 2000a; Loyaza, 2000b; Carroll, 2009; Caroll, 2019; Mody, 2012). Two of those factors are persistently present in most papers – the saving inertia and uncertainty.

The behaviour of households in the wake of the Great Recession exemplifies the strength of saving inertia. The jump in the household saving rate, triggered by the global economic and financial crisis of 2008-2009, was a response to the rise in job and income uncertainty augmented by the financial losses after the collapse of financial markets (Mody, 2012). Data confirms that the unemployment rate, usually taken as an indication of job uncertainty, increased substantially in 2009, enforcing the households' pessimism. In the European Union (EU), the unemployment rate soared from 7.2% in 2008 to 9.1% in 2009 and 9.8% in 2010. The reaction of monetary and fiscal authorities to the economic and financial crisis was targeted at stimulating demand by generous social transfers and loosening to extremity the financial conditions. In the wake of the 2008-2009 crisis and up to now, the financial conditions have remained lax and interest rates on deposits have fallen to the lower zero bound or even more - to negative numbers. From a theoretical point of view, the abundant liquidity and low deposit interest rates should have driven the saving rate down. However, the decline of the saving rate was quite moderate, in the EU from 13.5% in 2009 to 12.2% in 2019, being 12.2% in 2008. The interest rates in 2008 were higher by a multitude compared to their level in 2019. The weak downward trend in household saving was discontinued by the Covid-19 pandemic and in 2020 saving rate reached an unprecedented level of 18.6%.³ It is arguable whether saving inertia might cause a persistence of an enhanced saving rate long after the end of the Covid-19 pandemic whenever it happens.

Income and job uncertainty, activated especially in times of disasters and economic crisis, has been considered an important cause for precautionary saving. Mody, Ohnsborge and Sandri (2012) provide a brief but quite comprehensive overview of the theoretical literature on precautionary saving, observed in the event of rising uncertainty about future economic activity and household future income. The concept of uncertainty is quite an ambiguous one, subjected to interpretation. Different measures of uncertainty are introduced in models of precautionary saving. In their study Loayza, Schmidt-Hebbel and Luis Serven (2002b) use inflation as a measure of uncertainty. Studies during and after the Great Recession relate uncertainty to unemployment growth, deterioration in unemployment expectations and volatility of financial markets (Mody, 2012). The interest in the concept and measures of uncertainty swelled in the wake of the global crisis of 2008-2009 (Bloom, 2014). In the first year and a half of the Covid-19 pandemic research papers also focused on the concept of uncertainty and precautionary saving (Coibion, 2021).

Bloom (2014) summarises four mechanisms through which recessions might increase uncertainty. All four can be traced in the first year of the Covid-19 pandemic, although the rationale behind them differs compared to the rationale in Bloom. The first mechanism is

³ Eurostat data on household saving rate in EU.

through the slowdown in economic activity and the related reduction in the stream of information to producers, which increases the uncertainty about future economic developments. In the case of the Covid-19 pandemics, it was the government's restrictive measures and lockdowns that disrupted the normal stream of products and market information and pushed up uncertainty. Firms operating in sectors like tourism, restaurants and bars, recreational and sport facilities, air transport and other contact industries suffered an abrupt closure of business with a negative impact on all other dependent sectors. Second, forecasters face high forecast uncertainty in recessions. In 2020 forecasters at macro and micro levels were absolutely perplexed about what might happen in the future based on the limited knowledge about the Covid-19 disease, the unclear path of government measures, the unpreparedness of the health systems to absorb a rising number of infected people and the unanswered question about when a vaccine or medicine can be invented and applied. Third, ambiguous public policy, which is hyperactive in recessions, also increases uncertainty. In 2020 government policy fuelled uncertainty because it was hesitant, based on trials and errors, badly explained to the public, and surrounded by controversial opinions of medical experts. Fourth, recessions motivate research and prepare the ground for the reallocation of resources through innovations. Covid-19 introduced a delineation between essential and nonessential businesses. A fight for survival on the side of non-essential businesses might induce innovations in services and other contact industries accompanied by reallocation of resources and rising uncertainty about the future of the sectors.

The hesitant government policy and inadequate communication with the public contributed to the enhanced job, income, and health uncertainty in 2020. A paper by Dave, Sabia and Safford (2021) elaborates on the government measures applied in the USA to contain the spread of the disease. Similar measures with a different degree of severity were applied in the EU, too – stay-at-home orders, non-essential businesses closures, limits on in-person gatherings and capacity constraints at business venues. Most of the measures resulted in severe restrictions on citizens' mobility. Periodically the access to sectors like tourism, restaurants, sport facilities, and recreational facilities was absolutely forbidden.

The negative impact of government restrictions on economic activity was augmented by the enhanced sensitivity to health risk and self-restraining behaviour. In their study Dave, Sabia and Safford (2021) conclude that the relief of Covid-19 government restrictive measures in Texas in March 2021 did not change the cautious and self-restraining behaviour of people – a situation which hints at a longer-term subdued consumption growth rate and weaker than expected impact on the economic activity of the abolition of the restrictive government measures. The study of Goolsbee and Syverson (2021), based on cellular phone records data on customer visits in the USA, concludes that only 7% of the contraction in consumer traffic was explained by the legal restrictions, while fear of infection explains the rest. In their study on the macroeconomic effects of Covid-19, Fernandes-Villaverde and Jones (2020) comment that self-protecting measures and voluntary changes and restrain from consumption played a crucial role in the slowdown of economic activity. However, a study by Dossche and Zlatanos (2020) concludes that forced saving due to the lockdown was the main driver in the household jump in savings in the second quarter of 2020, but they also expect that households will preserve the higher saving rate in the near future.

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The enhanced health anxiety was caused by the confusion about how contagious and lethal the Covid-19 is. There was a spontaneous outburst of controversial theories and misguiding advice to the population. The heterogeneity in the response of people to Covid-19 is studied by Papageorge (2021). He provides brief information of research on other epidemic diseases (Mad cow, AIDS), stressing on the importance of susceptibility to the disease. People with low and high susceptibility do not change their behaviour, while people with medium susceptibility become more cautious and try to avoid the risk of infection. I would interpret those results in terms of the Covid-19 pandemic in the following way: people with low susceptibility to health risk (usually young, healthy people) may ignore warnings about the potential negative consequences of the disease on their own health. Those people do not want to change their usual way of living, they protest the government measures or do not obey them. People with high susceptibility to health risks are always cautious and accustomed to self-protection measures. The change in their behaviour will not be substantial. People with medium susceptibility to health risk may increase their self-protection measures against Covid-19 infection and start avoiding the consumption of goods and services, which may endanger their health safety. On overall, consumers might become more cautious and change their consumption pattern.

In summary, the hike in saving in 2020 can be decomposed into three layers – pure precautionary saving due to job, income, and wealth uncertainty (Levine, 2021), forced saving due to government measures to contain the spread of the infection (Dosshe, 2020), and health risk-avoiding behaviour (Goolsbee, 2021; Fernandez-Villaverde, 2020). All these determinants of saving in 2020 led to changes in the household consumption pattern.

3. Data

The household budget survey for Bulgaria is conducted by the National Statistical Institute (NSI) on a quarterly and annual basis, following the methodology applied in the EU member states⁴. The unit of observation is every randomly chosen ordinary household irrespective of the number of members and their material and personal status. Since 2010 the sample has consisted of 3060 households each quarter out of a population of around 2 million households.

The survey provides data about the income and expenditures of households. On the side of income, the survey presents the overall household regular income and its main sources – labour, entrepreneurship, property, social transfers (pensions, social benefits), regular interhousehold transfers, as well as the sale of property and other irregular receipts. The expenditures are categorised according to the harmonised classification of individual consumption by purpose (COICOP). Consumption expenditures are presented in ten groups: foods and non-alcoholic beverages (excluding catering); alcoholic beverages and tobacco; clothing and footwear; housing, water, electricity, gas and other fuels; furnishing and maintenance of the house; health (excluding products and services covered by the state

⁴ Household Budget Surveys in EU Methodology, https://ec.europa.eu/eurostat/documents/3859598/ 5875361/KS-BF-03-003-EN.PDF.pdf/42a95cc0-cb48-48c7-8d3a-dfc5fa265eff?t=1414781029000.

health-insurance system); transport (includes car purchases); communication; recreation, culture and education; miscellaneous goods and services. The annual data provides additional information about different breakdowns of income and expenditures, e.g., by decile income groups, size of the household, occupation of the reference person, socio-economic status of the reference person, number of employed members, number of children.

Although the household budget survey has been conducted in Bulgaria on a regular basis since 1953, there was a series of methodological changes and breaks in the data, the latest being undertaken in 2008. For that reason, the study is constrained to analyse the annual data for the period 2008-2020.

Since the NSI does not publish data about household disposable income and saving the two indicators are calculated here in the following way: disposable income equals total income minus expenditures on taxes, social insurance contributions, regular transfers to other households and other non-consumption expenditures; saving is calculated by subtracting from disposable income consumption expenditures. The calculations are based on annual data per member of the household, published by the NSI.⁵

The focus of the study is on data for 2009-2010 (the two years after the outbreak of the global financial crisis) and in 2020 (the first year of the Covid-19 pandemic) to identify similarities and differences in changes in consumption pattern in the two crisis periods.

A sketch of the key macroeconomic indicators for 2009-2010 and 2020 may shed light on the macroeconomic underpinning of changes in household saving and consumption. In both periods, the economy was hit by unexpected and extremely strong negative shocks.

The global collapse of financial markets liquidity after the financial corporation Lehman Brothers' failure in September 2008 triggered: a downfall in the global economic activity and trade; a fast decline in international commodity prices and a rise in the unemployment rate in most countries. In Bulgaria, the decline of real GDP was by 3.3% in 2009, followed by meagre growth of 1.5% in 2010; inflation decelerated from 12.0% in 2008 to 2.5% and 3.1% in 2009 and 2010, respectively. The unemployment rate soared from 5.6% in 2008 up to 6.8% in 2009 and 10.3% in 2010.

In 2020 the negative economic shock was generated by the Covid-19 restrictive measures of governments all over the world. The impact of those measures on economic activity, inflation and unemployment rate was alike to the shock of the global financial crisis of 2008 – 2009. Yotzov, Bobeva, Loukanova, Nestorov (2020) provide a thorough elaboration of the types of measures imposed by governments, the Bulgarian government included, to contain the spread of the Covid-19 pandemic. The authors assessed the possible decline of real GDP in Bulgaria in 2020 at between 2.4% and 5.7%. According to recent preliminary NSI data, the real GDP of Bulgaria declined by 4.4% in 2020 and despite the increase by 4.2% in 2021, it remained in 2021 at 99.6% of its pre-crisis level. Annual inflation remained low at 2.5% in 2020 and 1.2% in 2021, notwithstanding the acceleration of the inflation rate at the end of 2021. Contrary to 2009-2010, the unemployment rate increased modestly – from 4.2% in 2019 to 5.1% in 2020 and 5.3% in 2021.

⁵ https://infostat.nsi.bg/infostat/pages/module.jsf?x_2=27.

In the background of adverse macroeconomic developments data reveals that in 2009-2010 both disposable income and consumption expenditures in nominal terms plummeted, while in 2020 at the background of a continuing significant positive growth rate of disposable income, expenditures remained at the level of the previous year with a close to zero annual growth rate. An overview of disposable income, consumption expenditure and saving dynamics is provided in Figure 1 and Figure 2.

Figure 1

Figure 2





Source: NSI (Bulgaria), Household Budget Survey Data. Author's calculations.





Source: NSI, Household Budget Survey Data. Author's calculations.

The different dynamics of household income and expenditure between the two periods of the analysis is obvious: in the Great Recession, the downward adjustment of consumption expenditure paralleled the slowdown in the growth rate of disposable income, both going negative in 2010. As the focus of the study is saving and changes in consumption pattern, data reveals that a substantial decrease in expenditures took place in both years 2009 and 2010, maintaining high saving rate despite the economic recovery, observable since the middle of 2009. A decline in the saving rate started in 2011. Because of those findings, household data for 2009 and 2010 are averaged and treated as one year, named 2009-2010.

In 2020 there was a mild deceleration of the disposable income growth rate while consumption remained frozen at the level of 2019. The hike in the saving rate in 2020 reached 13.4% from 7% in 2019.

For the purpose of the analysis, the average data for the period 2011-2019, considered a period undisturbed by a severe crisis, is used as a benchmark in the study. The average saving to disposable income ratio for the period 2011-2019 is 9.5%.

The structure of consumption expenditures hints at common trends in the change of consumption pattern during the two crisis periods in comparison to the previous year, namely a slight loss in the share of clothing and footwear and transport (Table 1).

Table 1

	2008	2009-2010	2019	2020
Consumption expenditure	100.0	100.0	100.0	100.0
Food and non-alcoholic beverages	42.9	42.9	36.2	37.0
Alcoholic beverages and tobacco	5.1	5.4	5.2	5.2
Clothing and footwear	4.1	3.4	4.0	3.7
Housing, water, electricity, gas and other fuels	15.9	16.8	16.5	17.0
Furnishing and maintenance of the house	4.4	4.1	4.6	5.1
Health	5.6	6.3	7.6	7.7
Transport	8.2	7.1	9.2	8.2
Communication	5.2	5.3	5.2	5.6
Recreation, culture and education	4.3	4.3	6.4	4.9
Miscellaneous goods and services	4.3	4.3	5.2	5.3

Bulgaria: Structure of Household Consumption Expenditure (%)

Source: NSI (Bulgaria), Household Budget Survey Data. Author's calculations.

What is not observed for 2009-2010 but is discernible in 2020 is the increase in the share of furnishing and maintenance of housing and a substantial decline in the share of recreation, culture, and education (Table 1). Although the latter might be related to the government measures against the spread of the Covid-19 infection and self-restraint, the conclusions made on the basis only of the structure might be superficial and misleading.

4. Methodological Notes

As the objective of the research is to analyse the mechanism behind the hike in household saving through the changes in their consumption pattern, a counterfactual estimation of households' consumption of goods and services is constructed based on estimated income elasticities of demand by expenditure groups and the reported growth rate of disposable income. The analysis is complemented by an evaluation of changes in consumption pattern by income groups. Data on decile income groups is aggregated into three broader income groups, while the ten expenditures groups are categorised into three groups based on the elasticities of demand.

Theoretical and empirical models of consumption include as explanatory variables income, inflation, relative prices, wealth, and interest rates. In the academic literature, income is recognised as the main factor determining consumption. Empirical studies for Bulgaria (Georgiev, 1997; Chukalev, 2010; Peykov, 2021) have confirmed that income is the most significant explanatory factor in the consumption function, overwhelming the importance of other variables like inflation, relative prices, wealth, and interest rates. The very low inflation rates in the two crisis periods under study allow for ignoring the price elasticity of demand in our regression.⁶ Based on these findings, we have applied a simple OLS regression to calculate the income elasticities of demand.

So, the first step in the analysis was to calculate the income elasticities of consumption β_i by the ten expenditure groups (E_i). The elasticities β_i are calculated from annual data for the period 2011-2019, which is used as a benchmark period characterised by relatively smooth economic development. An OLS regression is applied following Gudjarati (1995, pp. 165-166).

$$ln(E_i) = \alpha_i + \beta_i . ln(Y disp)$$

where:

 E_i is expenditures by groups *i*, i=1,2,3...,10;

Ydisp – disposable income.

The calculated income elasticities represent the degree of each expenditure group importance (Table 2). It should be expected that very important expenditure groups have the smallest elasticity (below 1), they should be less sensitive to income fluctuations and will stay stable during downward consumption adjustment periods. Expenditure groups with a high degree of elasticity (above 1) should be the first to shrink in a crisis period.

As might be expected, the demand for food and non-alcoholic beverages is inelastic to changes in disposable income (the income elasticity is less than 1). If disposable income goes down, the consumption of inelastic products might also go down but at a lower rate than the income rate of change. While the income elasticity of expenditures on communication may surprise being close to but below 1, most probably it is due to the fact that the wide distribution of internet and individual electronic devices makes communication an essential service needed by households. The unit elasticity of alcoholic beverages and housing, water, gas and fuels means that households are able to adjust the corresponding consumption expenditures in line with the changes in disposable income.

(1)

⁶ The gradual soar of international fuel prices since the middle of 2021 was further exacerbated in February 2022. Most likely inflation would continue accelerating in 2022. If inflation acceleration is perceived by households as a long-term trend, it might trigger new expenditure restructuring. That might blur the potential long-term impact of Covid-19 on the consumption pattern of households.

Table 2

Bulgaria: Disposable Income Elasticity of Demand by the Ten Consumption Expenditure Groups (ordered from inelastic to most elastic groups)

	2011 2010
	2011-2019
Food and non-alcoholic beverages	0.71
Communication	0.97
Alcoholic beverages and tobacco	1.00
Housing, water, electricity, gas and other fuels	1.00
Health	1.29
Clothing and footwear	1.29
Miscellaneous goods and services	1.39
Transport	1.51
Recreation, culture and education	1.77
Furnishing and maintenance of the house	1.78

Source: NSI, Households' Budget Survey Data. Author's calculations. The income elasticities b are calculated according to the OLS regression log (consumption expenditure by group) = a + b . log (disposable income). (See Gujarati, D., Basic Econometrics, 3rd edition, 1995, McGraw Hill, 1995, pp 165-166).

The income elasticity of the remaining six expenditure groups is greater than 1 (see Table 2Table 2

Bulgaria: Disposable Income Elasticity of Demand by the Ten Consumption Expenditure Groups (ordered from inelastic to most elastic groups). Elastic products are subjected to a higher rate of change compared to the disposable income rate of change. In the case of a reduction in disposable income, households reduce disproportionately more consumption of those expenditure groups.

However, the elasticity of 1.5 for expenditures on transport might be confusing. Transport is as vital for the modern household as communication and its elasticity of demand should be expected to be close to one. The reason behind the higher than 1 elasticity of transport expenditure can be explained by the fact that this group includes a diversified set of goods and services, the most volatile of which is the purchase of automobiles, which usually drops considerably in the event of a recession. The purchase of cars might be easily postponed (Bloom, 2014). In April 2020, the real annual drop in car purchases was by 44.8%. At the end of 2020, the real decline in car purchases was partially recovered and amounted to 23%. The drop in car purchases in 2020 was so prominent that the weight of this group in the consumption basket, applied in calculating the harmonised index of consumer prices (HICP), fell from 19.52‰ to 15.62‰.⁷ In 2021 there were huge fluctuations in car purchases in real terms.

Two expenditure groups are characterised by the highest income elasticity of demand – the complex group called recreation, culture and education and the group covering furnishing and maintenance of the house. Those groups exhibit an interesting dynamic during the two crisis periods. We will elaborate more in the analysis below.

⁷ Eurostat. Data on weights by products in the consumption basket, applied for the calculation of HICP.

The next step in the empirical analysis is the calculation of a counterfactual consumption for each expenditure group answering the following question – what would have been the growth rate of consumption of each of the ten expenditure groups if the disposable income changed at the reported rate and there was no economic or health crisis? For that purpose, we multiply the estimated income elasticities of demand to the reported disposable income growth rate in 2009-2010 and correspondingly in 2020.

$$\frac{\Delta E_i^c}{E_i^c} = \beta_i \cdot \frac{\Delta Y disp}{Y disp}$$
(2)

where:

 $\frac{\Delta E_i^c}{E_i^c}$ is the estimated (counterfactual) expenditure growth rate;

 β_i – the income elasticities of consumption by each expenditure group for 2001-2019 period;

$$\frac{\Delta Y disp}{Y disp}$$
 – the reported growth rate of disposable income.

The estimated and the reported growth rates of consumption by the ten consumption expenditure groups are presented in Table 3.

Table 3

	2009-201	0 to 2008	2020 t	o 2019		
	Estimated	Reported	Estimated	Reported		
	growth rates of	growth rates of	growth rates of	growth rates of		
	demand (%)	demand (%)	demand (%)	demand (%)		
Consumption expenditure	6.2	1.9	7.5	-0.2		
Food and non-alcoholic beverages	4.2	2.0	5.1	2.1		
Alcoholic beverages and tobacco	5.9	8.1	7.2	1.5		
Clothing and footwear	7.6	-13.3	9.2	-6.9		
Housing, water, electricity, gas and other fuels	5.9	7.7	7.2	3.0		
Furnishing and maintenance of house	10.5	-4.1	12.7	12.6		
Health	7.6	15.5	9.2	0.5		
Transport	8.9	-12.1	10.8	-11.1		
Communication	5.7	4.5	6.9	8.4		
Recreation, culture and education	10.4	1.3	12.7	-22.4		
Miscellaneous goods and services	8.2	0.4	9.9	2.3		

Bulgaria: Estimated (counterfactual) and Reported Annual Growth Rates of Consumption by the Ten Household Consumption Expenditure Groups (%)

Source: Author's calculations.

The magnitude of the adjustment is more pronounced when we make the difference between the reported and the estimated annual growth rate of consumption. It reveals those expenditure groups that have been curtailed the most by the households in their effort to respond to the uncertainty generated by both crises.

$$\frac{\Delta E_i}{E_i} - \frac{\Delta E_i^c}{E_i^c} < 0 \text{ or } \frac{\Delta E_i}{E_i} - \frac{\Delta E_i^c}{E_i^c} \ge 0$$
(3)

Nenova, M. (2022). Households' Consumption Pattern and Saving – Evidence for the First Year of the Covid-19 Pandemic in Bulgaria.

where:

 $\frac{\Delta E_i}{E_i}$ is the reported growth rate by expenditure groups; $\frac{\Delta E_i^c}{E_i^c} - \text{estimated (counterfactual) growth rate by expenditure groups.}$

To assess the changes in consumption pattern by income groups, data by decile income groups and the corresponding expenditures on the ten expenditure groups can be employed. To gain better visibility of the results, income deciles data are aggregated into three income groups. The applied criterion is the average saving to disposable income ratio for the period 2011-2019, which is 9.5%. The first income group, low-income households, consists of the first three decile groups, which in the 2011-2019 period are characterised by dissaving or zero saving. The second income group, mid-income households, combines deciles from 4 to 7, characterised by a positive but below the average of 9.5% saving rate for the period 2011-2019. The third income group, high-income households, includes the last three deciles with a saving rate above the average of 9.5%.

5. Counterfactual and Reported Consumption of Goods and Services by Ten Expenditure Groups

The difference between the reported and the counterfactual (estimated) annual growth rate of consumption by expenditure groups is presented in Table 4. The shock generated by the Covid-19 pandemic in 2020 initiated a stronger downward adjustment in household consumption expenditure compared to the shock of September 2008 and the Great Recession. Hence, the downward adjustment of consumption expenditures is more pronounced in 2020 compared to the average for 2009-2010 (Table 4).

Table 4

Bulgaria: Difference between Reported and Estimated (counterfactual) Consumption Expenditures Growth Rate (percentage points), sorted by the similarity of magnitude of adjustment

	2009-2010 to 2008	2020 to 2019
Consumption expenditure	-4.3	-7.7
Similar or close to similar magnitude of adjustment		
Transport	-21.0	-21.9
Clothing and footwear	-20.9	-16.2
Miscellaneous goods and services	-7.7	-7.7
Food and non-alcoholic beverages	-2.2	-2.9
Significant difference in the magnitude of adjustment		
Furnishing and maintenance of the house	-14.6	-0.2
Recreation, culture and education	-9.2	-35.0
Communication	-1.2	1.4
Housing, water, electricity, gas and other fuels	1.8	-4.2
Alcoholic beverages and tobacco	2.2	-5.6
Health	7.9	-8.7

Source: Author's calculations.

Based on the difference between the reported and the estimated growth rate of consumption expenditures, two sets of expenditures can be distinguished. The first set contains those expenditure items which underwent a similar magnitude of change in the two crisis periods, namely transport (in particular the drop in automobile purchases), clothing and footwear, miscellaneous goods and services, and the smallest adjustment was in the group of food and non-alcoholic beverages. It is assumed that the adjustment of these expenditure groups is related to job and income uncertainty. A similar pattern of consumption adjustments might be observed in any economic and financial crisis and can be related to the precautionary motive for saving.

The second set consists of expenditure groups that exhibit significant divergence in the magnitude of adjustment between the two crisis periods. Two expenditure groups within the second set underwent significant downward adjustment in 2020, namely recreation, culture and education and health. The changes in their consumption can be explained almost entirely by the specific impact of the Covid-19 pandemic on household behaviour.

Household spending on recreation, culture and education includes audio-visual, photographic and information processing equipment; other major durables for recreation and culture; other recreational items and equipment, gardens, and pets; recreational and cultural services; newspapers, books, and stationery; package holidays. Consumption of goods included in this group can easily be postponed for better times, while the consumption of services can just be cancelled, which explains the reduction of spending in 2009-2010. As Bloom (2014) states, it is more difficult to postpone the consumption of entertainment, but in 2020 the group suffered the deepest recession because of the Covid-19 government restrictive measures. To magnify the impact of government measures, some households gave up the consumption of items included in this expenditure group because of enhanced health anxiety and self-imposed protection measures (Goolsbee, 2021). When the pandemic is contained and the government restrictive measures abolished, consumption of recreational, entertainment and cultural services might remain subdued because of the already enhanced health risk alert.

Household behaviour vis-à-vis health expenditure is quite peculiar in 2020. The group includes spending on medical products, appliances, and equipment; out-patient services; hospital services, which are covered by individuals at the expense of their own income (i.e. not financed by the state health-insurance system). In 2009-2010 the spending on items of this group went up considerably, well above the estimated counterfactual health consumption growth rate, while in 2020, reported consumption growth was quite below the estimated one. Why did households abstain from consuming self-financed medical services in accordance with disposable income growth? It is possible that households avoided visits to medical establishments because of fear from being infected by the personnel, as it was well known that in 2020 the number of infected medical staff went up considerably. Perhaps, the relative downward adjustment of health expenditures is an argument in support of the understanding that the Covid-19 pandemic alerted people about the importance of health self-protection measures and their behaviour changed to a more cautious one.

The expenditure group of furnishing and maintenance underwent a sizable downward adjustment in 2009-2010. The longer name of the group is furnishing, household equipment, and routine household maintenance, and it covers expenditures on furniture and furnishings, carpets, and other floor coverings; household textiles; household appliances; glassware,

tableware, and household utensils; tools and equipment for house and garden; goods and services for routine household maintenance. One can easily postpone or temporarily give up their consumption in hard and uncertain times. Although spending on furnishing and maintenance grew up sizably in 2020 compared to other expenditure items, its reported growth rate was very close to the counterfactual estimate, contrary to the substantial downward adjustment in 2009-2010. One possible explanation of the difference in the behaviour of households concerning expenditures on furnishing and maintenance in the two crisis periods can be in the degree of uncertainty perception. Perhaps the fear of job or income loss was not a dominant factor affecting household behaviour in 2020. In Bulgaria, as well as in other EU countries, the government announced a set of measures to preserve jobs and compensate for income loss in companies affected by temporary closures or enforced reduction in capacity utilisation. Compared to 2009-2010, when the unemployment rate peaked up from 5% in the fourth quarter of 2008 to 10.0% in the second quarter of 2010, in 2020, a temporary increase in the unemployment rate in the second quarter of 2020 to 5.9% from 4.6% in the first quarter then subsided to 5.2% at the end of the year, twice lower compared to the hike in the unemployment rate in 2009-20108. Moreover, the stay at home and work at home policy may motivate households to take the opportunity and repair or refurnish their houses, another way to avoid the accumulation of undesirable high levels of savings.

Communication expenditures changed in the opposite direction in the two crisis periods. In 2009-2010 the spending for communication services was weaker compared to the estimated counterfactual expenditure, while in 2020, it was higher than the counterfactual. The explanation might be quite straightforward. Communication expenditures are gaining more and more importance. In 2020 when physical contacts were constrained and the home office was recommended for all companies that can apply it, communication spending normally went up. According to an ECB ad-hoc survey of leading euro area corporations, the expectations for more teleworking and digitalisation of operations are expected to stimulate the consumption of communication services in the future (Maqui, 2020). The relative increase in expenditures on communication in 2020 can also be explained by the fear of social contacts induced by the disease, which spurred contacts via electronic devices.

Health risk anxiety most probably negatively affected all expenditure groups where consumption is accompanied by physical contacts, like in retail trade and services establishments. Part of the downward adjustment in 2020 of food and non-alcoholic beverages, clothing and footwear, and alcoholic beverages is most probably due to self-restraint from visiting shopping premises.

To conclude this section, the empirical analysis alerts that three sectors of the economy, those producing and/or trading vehicles, clothing and footwear, miscellaneous goods and services, are vulnerable to shocks generated by an economic downturn. The negative impact of Covid-19 in relative terms was concentrated on two expenditure groups – recreation, culture and education, and health.

⁸ NSI, https://infostat.nsi.bg/infostat/pages/reports/result.jsf?x_2=1016.

6. Changes in Saving and Consumption Pattern by Income Groups

Although the positive relationship between saving rate and income might seem trivial, data reveals that the three income groups are saving more or dissaving less in the crisis periods, with the high-income group increasing its saving rate the most (Figure 3).

Figure 3



Saving to Disposable Income Ratio by the Three Income Groups (%)

Source: NSI (Bulgaria), Household Budget Survey Data. Author's calculations.

Considerable differences in behaviour are observed by income groups in terms of disposable income and consumption growth rates in each of the two crisis periods (Figure 4).

Figure 4





Source: NSI (Bulgaria), Household Budget Survey Data. Author's calculations.

Common for the three income groups is that the disposable income registered positive growth in the two crisis periods, the highest rate registered by the low-income group and the lowest by the high-income group. The consumption growth rate of the low- and mid-income groups decelerated relative to the strong disposable income rate of increase, while the largest downward adjustment in consumption was undertaken by the high-income households. For the latter, the reduction in consumption took place in each of the two crisis periods, being particularly prominent in 2020. On average, the hike in the saving of the high-income group determined the overall hike in the household saving rate in both crisis periods. A similar conclusion is attained by Attinasi, Grazia, Bobasu and Manu (2021).

The ten expenditure groups can also be aggregated into three categories - essential goods and services, moderately essential goods and services, and non-essential goods and services. The choice of criterion for the classification is difficult. One criterion is to make use of the already calculated income elasticity of demand by the ten expenditure groups with the understanding that inelastic expenditures groups are the most important (essential) while the highly elastic expenditure groups are the least important (non-essential). A classification, according to the income elasticity of expenditures, allows to contemplate on the potential speed at which households may respond to unfavourable economic shocks without resorting to the government social safety net.

Another criterion is to calculate the ratio of consumption expenditure of the mid- and highincome category to the corresponding consumption expenditure by the low-income category. The smallest the ratio, the higher the importance of the corresponding expenditure group for all households; the highest the ratio, the least important is the expenditure group for the subsistence of a household. It can be expected that during a recession, the level of essential expenditures of higher-income groups converges to the corresponding level for the lowincome group, reducing consumption inequality.

Although the aspect of consumption inequality is important, the aim of this study is to reveal changes in consumption pattern that allowed households to quickly respond to a sudden and substantial negative shock – like the outburst of the global financial and economic crisis of 2008 and the Covid-19 pandemic of 2020. The income elasticities of demand for each of the ten expenditure groups can supply information about the potential speed of response. Households cannot easily and fast curb consumption of inelastic expenditures.

A quantitative criterion to classify the ten expenditure groups into three broad categories – essential, moderately essential, and non-essential goods and services, based on the income elasticities of demand is as follows: expenditure group with an income elasticity of 1 and below 1 is classified as essential; expenditure group with income elasticity of demand above 1 and around 1.5 is considered moderately essential; expenditure group with income elasticity above 1.5 is considered non-essential. Table 5 exhibits the results for the new three groups.

The share of essential goods and services is relatively high, indicating that households may face financial difficulties in a recession since they cannot quickly reduce consumption in response to the possible negative income shocks. By income groups, as expected, the share of essential goods and services is high for the low-income group, and the difference with the high-income group is 13.8 percentage points (Table 6).

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Table 5

Expenditure Groups Classified by Income Elasticity of Demand

	Income elasticity of demand for 2011-2019	Share in consumption expenditure for 2011-2019 (%)
Essential goods and services		70.4
Food and non-alcoholic beverages	0.7	38.1
Communication	1.0	5.3
Alcoholic beverages and tobacco	1.0	5.1
Housing, water, electricity, gas and other fuels	1.0	17.1
Moderately essential goods and services		14.0
Health	1.3	6.6
Clothing and footwear	1.3	4.1
Miscellaneous goods and services	1.4	5.2
Non-essential goods and services		16.9
Transport	1.5	8.4
Recreation, culture and education	1.8	5.6
Furnishing and maintenance of the house	1.8	4.4

Source: Author's calculations.

Table 6

Bulgaria: Share of Essential, Moderately Essential, and Non-essential Goods and Services by the Three Income Categories (average for 2011-2019) (%)

	Low Income Group	Mid Income Group	High Income Group
Essential goods and services	74.2	68.1	60.4
Moderately essential goods and services	14.2	15.9	16.7
Non-essential goods and services	11.5	16.0	22.9

Source: NSI (Bulgaria), Household Budget Survey Data. Author's calculations.

As expected, it is the non-essential goods and services, the most elastic ones, that contribute the most to the downward adjustment in consumption expenditures (Attinasi, 2021; Coibion, 2021; Maqui, 2020) (Figure 5).

Figure 5

Bulgaria: Contribution to the Growth Rate of Consumption Expenditures by Three Income and Three Expenditure Groups (percentage points)



Source: NSI (Bulgaria), Household Budget Survey Data. Author's calculations.

The high-income households reduced their consumption of moderately essential and nonessential goods and services – clothing and footwear, transport (especially automobile purchases), recreation, culture and education in the two crisis periods. The magnitude of adjustment was almost doubled by the specific factors of the Covid-19 pandemic – the government restrictive measures which reduced mobility and constrained the access to the service sector and the enhanced health risk alert. It is possible that the notion of human capital is better understood by high-income households, whose members are usually with higher education and prestigious job positions. In the future, they might preserve the newly acquired sensitivity to health-threatening factors and impose self-restraint in the consumption of services.

To summarise the findings in this section, the overall increase in the household saving rate in the two crisis periods can be explained by the behaviour of the high-income group and the considerable reduction of moderately essential and non-essential goods and services consumption by that income group.

7. Conclusions

The objective of the study was to outline the mechanism behind the hike in household saving in 2020 through the changes in their consumption pattern in comparison to 2009-2010, the two years after the outbreak of the global financial and economic crisis. The Covid-19 health crisis added new dimensions to the set of factors influencing uncertainty and, therefore, household saving rate. The government measures to contain the spread of Covid-19 affected all businesses in the services sector and contributed to the reduction both of supply and demand. The jump in uncertainty due to business closures and expectations of job and income losses was further pushed up by the enhanced perception of a health risk – something new in the recent experience of people. The hike in saving in 2020 can be decomposed into three layers – pure precautionary saving due to job, income, wealth uncertainty, forced saving due to government measures to contain the spread of the infection, and health risk-avoiding behaviour via self-restraining behaviour of consumers of certain goods and mostly of services. All these determinants of saving in 2020 led to changes in the household consumption pattern.

The shock generated by the Covid-19 pandemic in 2020 initiated a stronger downward adjustment in household consumption expenditure compared to the global liquidity shock of September 2008. However, there are differences in the magnitude of adjustment by expenditure groups. The empirical analysis, based on annual household budget survey data for Bulgaria for the period 2008-2020, alerts that three sectors, those producing and/or trading with vehicles, clothing and footwear, miscellaneous goods and services, are vulnerable to negative shocks generated by any economic downturn. The specific negative impact of Covid-19 in relative terms was concentrated on two expenditure groups – recreation, culture and education, and health. Likely, the heightened vigilance with respect to health risk factors restrained households from consumption of all ten expenditure groups and might have long-term negative consequences on consumption growth but especially of services.

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The overall increase in household saving rate in the two crisis periods – after the global financial and economic crisis of 2008 and the Covid-19 pandemic in 2020, can be explained by the behaviour of high-income groups. They experienced in both crisis periods an insignificant, close to zero, increase in disposable income, contrary to the substantial income growth rate of low- and mid-income groups, and they undertook the largest reduction in consumption which affected to a great extent some moderately essential and all non-essential goods and services. The hike in saving (and the reduction in consumption) of high-income households was most prominent in 2020. A changed consumption pattern, characterised by falling share of non-essential goods and services in consumption expenditures, might persist longer after the government abolish all restrictive measures because of an enhanced health risk alert.9 Preliminary NSI GDP data for 2021 can be used to assess the level of recovery in sectors most negatively affected by Covid-19. The real value added of arts, entertainment and recreation, repair of household goods and other services in 2021 is at 84.9% compared to its 2019 level. In 2021 the level of the real value added of the wholesale and retail trade, a group that also includes repair of motor vehicles and motorcycles, transportation and storage, accommodation and food service activities was at 91.2% of its 2019 level.

Based on the above findings, a conclusion might be drawn that changed households' behaviour would have negative long-term implications on the operation of the service sector. Government measures to boost demand for products of those sectors or provide direct transfers to support financially service sector firms might be ineffective. Instead, efforts on the side of the authorities and the business to build up stronger health-safety provisions may be more efficient to motivate the demand for services. Harchandani and Shome (2022), in a concise and yet exhaustive way, recommend a number of anti-Covid-19 measures for tourism, e.g. maintain a high level of hygiene and sanitation facilities, use of automation technology, artificial intelligence, and ease of digital devices. Similar measures can be advanced in other service sectors.

At a national level, based on the best practices for resolving the Covid-19 pandemic crisis, a clear-cut strategy and flexible organisational framework may be drawn for timely and effectively counteraction to possible contagious disease outbursts in the future. The key component of the strategy should be a set of measures to improve the public's knowledge about the cons and pros of vaccination. The public should be well informed and aware of the practical measures undertaken by the government and the business to reduce consumers' health risks.

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Volume 31(6), 2022

THROUGH CIRCULAR TO LOW CARBON ECONOMY – CONCEPT AND EVIDENCES IN THE EU MEMBERS³

The aim of the study is to present an opportunity for the concept of circular economy to become a lever for the transition to a low-carbon and environmentally friendly economy. The correlation between key indicators for circular economy and change of GHG emissions in EU countries has been analysed, and a series of econometric models have been developed. An analysis has been conducted for 4 sets of countries – Bulgaria, the EU countries as a whole and the communities of old and new members separately. The existence of untapped opportunities related not only to more efficient use of resources, but also to the possibility of radical change in business models has been revealed in the analysis. The conclusions reached show that the concept needs to be extended so as to break the relation between economic growth and waste production, as well as the potential to reduce GHG emissions.

Keywords: circular economy; greenhouse gas emissions; sustainable production and consumption; recycling; EU

JEL: 013; 014; P28; Q01; Q52

1. Introduction

Targets agreed upon in the Paris Agreement to limit global temperature rise to below 2^oC (possibly 1.5^oC) by 2100 and to increase the effectiveness of the fight against climate change have made the EU's efforts in this direction priority. Challenges are complex and interconnected. They imply the development of a set of policies that lead to profound transformation. The European Green Pact (2019) is a response to these challenges. It is a new

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³ Study has been realized by the support of Scientific Investigation Found of UNWE – project NI-8-2021 "Macroeconomic and Social Dimensions of Ecological Transformation of Economy in the Context of the European Green Pact" and project BG05M2OP001-2.016-004-C01 "Economic Education in Bulgaria 2030", funded by the OP "Science and Education for Smart Growth", co-financed by the EU through the ESIF.

This paper should be cited as: Chipeva, S., Ivanova, V. (2022). Through Circular to Low Carbon Economy – Concept and Evidences in the EU Members. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 23-37.

Chipeva, S., Ivanova, V. (2022). Through Circular to Low Carbon Economy – Concept and Evidences in the EU Members.

growth strategy that aims to transform the EU into a prosperous society with a modern, resource-efficient and competitive economy that should be decarbonised by 2050 and with economic growth not dependent on resource use. Building on the UN's new Sustainable Development Goals (SDGs), this transformation goes through a complete change in the business models of companies and households. Economic growth, just ecological transition, resource-efficient and low-carbon economy are key development focuses for the next decade in the newly adopted Green Pact. The ambitious goal that EU Member States have set themselves to play a decisive role in the process of ecological transformation of the economy in order to permanently address climate change requires radical, decisive and coherent action by all stakeholders. Investment Plan for a Sustainable Europe aims to mobilise at least $\in 1$ trillion of investment to achieve the objectives of the European Green Pact. To support action on environmental transformation and to ensure a rapid and sustainable recovery from the COVID-19 crisis and the transition to a green economy, the EC has created a new financial instrument, the New Generation EU. The fight against climate change and the need for a radical change not only in production methods but in the very concept of economic development have become the core of European economic policy in recent years. Making economic recovery a catalyst for the ecological transition and supporting efforts to achieve carbon neutrality by 2050 have become important priorities on the government agendas of the majority of European countries and of many NGOs. Most of the new Recovery and Sustainability Plans submitted by the member states to the European Commission to receive support for specific projects from the funds earmarked in the New Generation EU financial instrument, concern the transition to a low carbon economy and drive to further reduce greenhouse gas emissions. Up to now, CO_2 emissions remain too high despite the progress made in their limiting in recent years. According to the European Environment Agency (EEA), there was a 28% drop in emissions in the EU between 1990 and 2019 (EEA, 2021). Although the EU is a world leader in the fight to reduce greenhouse gas emissions (Figure 1), it is still far from achieving its targets of a 55% decline by 2030 and carbon neutrality by 2050. Based on 2019 data, the main emittents remain the sectors related to energy production (27%), transport (23%) and industrial production (including construction -12%).

Figure 1



Source: EEA.

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Achieving these goals requires a shift to a more circular economy and is a vital contribution to the development of an economic model that is not only about profit but also about protecting the environment. In this context, our current linear economic system - resource extraction, production, consumption, disposal – is not sustainable and must be changed. The Circular Economy (CE) can be defined as a closed loop, covering each of the three areas: supply and responsible choice of producers, demand and consumer behaviour and waste management. According to the definition of the French State Agency for Sustainable Development (ADEME), which is adopted as a working definition in this study, "The circular economy is an economic system of exchange and production in which, at each stage of the life cycle of a product (good or service), the aim is to increase efficiency in the use of resources and reduce the harmful impact on the environment, ensuring the well-being of individuals" (ADEME, 2014, p. 4). Transition to CE aims to go beyond the limits of the linear model and to impose responsible and efficient consumption of natural resources and materials, new business models related to the production and consumption of products that meet the concept of eco-design, as well as prevention, recycling and hierarchical management and use of waste (Esposito et al., 2016, Aurez and Georgeault, 2019). It can be seen as an integral part of the concept of sustainable development as it is closely correlated with each of the dimensions – economic, social and environmental (Hours, Lapierre, 2013).

In order to meet today's economic challenges related to scarce, finite and increasingly costly resources on the one hand and the environmental needs on the other, CE is based on three fundamental principles (Figure 2).

Figure 2



Source: author's systematisation.

New vision covers a range of activities, new practices, and business models, interlinked, and hierarchised according to their contribution to optimising the use of raw materials and energy. Increasing consumption of resources and the negative environmental impact caused by it requires a change in the economic model (Pieroni et al., 2019). The concept of circular economy is part of this change. Ecological transition to CE has as its immediate task to optimise management of resources – both materials and energy. Moreover, the effects of the transformation go far beyond this task, and they are projected on the outcomes related to the fight against climate change, a new type of economic growth and new quality of life (Cavallo, 2018; Martinez-Alier, 2012; Pottier, 2016). Such an approach should include a global, systemic, and integrated vision. The transition to a circular economy requires fundamental changes in production and consumption systems that go far beyond resource efficiency and waste recycling. The circular economy model is a closed loop, covering each of the three areas: supply and responsible choice of producers, demand and consumer behaviour and waste management. Unlike the linear economy model (extraction, production, consumption, waste), CE produces goods and services, limiting the use of raw materials and energy on the one hand and reducing waste generation on the other (Rogers, Hudson, 2011).

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The circular economy model implies a resource-efficient economy (Fricker, 2003; Ellen MacArthur Foundation, 2012). It means that by limiting resource use at the input of the system, the CO_2 emissions associated with that extraction are also reduced. At the same time, CE is an energy-saving economy based on the use of alternative energy from renewable sources and the implementation of such a model could reduce emissions associated with fossil fuel extraction by energy-producing use of waste recovery methods. CE is a recycler and actively enforces the use of secondary materials, efficiently utilising residual resources on cascading basis (Seidl, 2007). This not only increases resource efficiency, reduces the economy's dependence on scarce resources, but could also reduce greenhouse gas emissions (GGE). However, in order to be easily recyclable, products must be adapted to this. CE builds on the concept of eco-design and through the development of repair, re-use and repair activities allow to extend the life cycle of products, save resources, reduces waste and, therefore CO₂ emissions. The circular economy model goes far beyond the idea of waste minimisation (Stahel, 2010, Clarkson et al., 2008). It is a sharing economy - it promotes sharing, especially the development of new business models related to mobility, responsible consumption and sharing. These models, applied especially in urban transport, have a synergistic effect, and have an impact not only on traffic, air cleanliness but also on emission volumes. Last but not least, CE is a functional economy (Ghisellinia et al., 2016). Dematerialisation and the use of services instead of products, in addition to opening up new niches, offers new jobs and incomes by changing existing business models, contributing to the reduction of resource consumption and hence promoting a transition to a low carbon economy.

The aim of the paper is to explore the possibility that the circular economy concept becomes a lever for transition to low carbon and green economy. The impact of key circular economy indicators adopted by EU on the change in greenhouse gas emissions in EU countries, has been analysed. Carbon removals can be nature-based, or based on increased circularity, for instance, through long term storage in wood construction, re-use and storage of carbon in products such as mineralisation in building material(COM/2020/98).

The research thesis of the study is that by building on the principles of the CE and applying its model, the economies of EU member states can successfully achieve their low carbon economy goals by 2050.

2. Methodology and data

2.1. Methodology

Recently there have been plenty of studies dedicated to the green transformation. However, the usual focus of studies is put on the green growth in the EU (Sneideriene, Viederyte, 2020), the development of the circular economy in EU countries (Ivanova, Chipeva, 2019; Zielinska, 2019), new opportunities and challenges of transition to low-carbon and resource-efficient economy (Camilleri, 2021; Marin et al., 2014). Empirical studies concerning the effects of main indicators recommended by Eurostat for measuring circular economy (COM029) on GHG emissions within EU country members as a whole and defined subsets of them, including Bulgaria alone, were not published by now. The methodology applied in the study

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aims to explore how much the transition to the circular economy model leads to a reduction of GHG emissions in EU countries as a whole and in defined subsets, including in Bulgaria.

The relationship between greenhouse gas emissions and 6 adopted indicators of circular economy was analysed. Indicators of the circular economy under consideration in the analysis are presented in the table below (Table 1).

Table 1

Variable	Indicator	Measure
Y	Greenhouse gas emissions – dependent	Tonnes per capita
X1	Circular material use rate	Percentage
X2	Energy productivity	Euro per kilogram of oil equivalent (KGOE)
X3	Resource productivity and domestic material consumption (DMC)	Euro per kilogram, chain-linked volumes (2015)
X4	Production, value-added and exports in the environmental goods and services sector	Million Euro
X5	Generation of waste, excluding major mineral wastes by hazardousness	Kilograms per capita
X6	Recycling rate of all waste excluding major mineral waste	Percentage

Indicators and respective variables under consideration in the study

Source: own elaboration.

Selection of indicators was done among all the adopted by the European Commission in accordance with the principles and goals of the circular economy. To meet the purpose of the study, the indicators are selected to present different aspects of the circular economy. Relevance, acceptability, reliability, simplicity of use and sustainability of indicators were additional criteria taken into consideration for selection. Four sets of countries have been analysed in terms of the effects of indicators identified for circular economy and ecological production on the greenhouse gas emissions produced – (1) all EU members, including the UK (EU-28); (2) the old members, including UK (EU-15); (3) the new joined country members after 2004 (EU-13); and (4) Bulgaria alone (Table 2). The UK is included in the study since it is yet an EU member during the period under consideration. Variables for each indicator in the groups excluding Bulgaria have been calculated as means over countries in the respective group by years. Analysis for each of the 4 sets of countries has been conducted separately.

Table 2

Structure of country groups included in the study

EU-28	Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech, Denmark, Estonia, Finland, France, Germany, Greece, Ireland, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia Spain, Sweden, UK
EU-15	Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Spain, Portugal, Sweden, UK
EU-13	Bulgaria, Czech, Croatia, Cyprus, Estonia, Latvia, Lithuania, Hungary, Malta, Poland, Romania, Slovenia, Slovakia
BU	Bulgaria

Source: own elaboration.

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At the beginning of the analysis, all the variables considered have been tested for autocorrelation. The autocorrelation function of each of them has been explored and Q-test for the significance of the autocorrelation coefficients up to 9th order has been conducted. Correlation between Greenhouse gas emissions and each of the circular economy indicators considered as factors in the study has been explored first by respective single correlation coefficients calculation and their statistical significance has been tested. Correlation analysis outcomes have assisted factors selection in regression models after.

Multiple linear regression models of greenhouse gas emissions depending on the six nominated indicators for each pointed group of countries have been developed. This type of models has been applied due to the authors aim for exploring and presenting the partial effect of identified factors on GHG emissions. All the variables involved in the analysis have been tested for stationarity by applying the ADF test first, and Phillips-Perron test and the KPSS test then. Different unit root tests have been applied since the results showed abnormal high order integration (2nd or higher) for most of the variables (see Table A1 in Appendix).

The first trial for models specification was to use differences of respective orders for the integrated (or autocorrelated) series, but the models outcomes were not reliable. Moreover, using higher-order differences make models outcomes difficult for interpretation and more or less meaningless for the modelled correlations. Then, for models simplification, only the dependent variables were presented by 2nd and 3rd order differences, but results again were not satisfying. Taking into consideration all the above, we decided to build models including all the variables by their original values. It made the models more realistic and understandable on the one hand and allowed to apply Stepwise Least Square (SLS) method for factors selection on the other. Quality of models outcomes has been assessed and diagnostic of estimated models has been conducted. To overcome serial correlation, provoked by the nonstationary dependent variable, a specific approach for modelling the residuals correlated has been applied. Using this approach, the special models known as regARIMA models (or ARIMAX also) have been created in which autoregression (AR) and/or moving average (MA) components for the residuals were included where it was necessary. Thus the negative impact of autocorrelated and/or nonstationary series in the models was overcome and outcomes could be regarded as reliable.

All the analyses are applied with the econometric package Eviews, v.8.

2.2. Data

Empirical data used in the analysis is publicised on the Eurostat website for each country EU member for period from 2010 to 2019. For most of the indicators under consideration in the study annual data for each year is available, but for 2 of them (Generation of waste excluding mineral wastes by hazardousness and the Recycling rate of all waste excluding mineral waste) Eurostat provides data for each second year. To make the time series for these indicators comparable to the rest ones, the missing data for intermediate years have been fulfilled by interpolation using averaging the neighboured members. Data for 2019 for these time series have been obtained by extrapolation of the respective trend lines.

3. Results and Discussion

Most of the variables in the analysis, including all the series of GHG emissions, have been proven to be non-autocorrelated and the rest ones are 1st order autocorrelated. First-order Autocorrelation coefficients are presented in Table A2 in the Appendix. Since the autocorrelation is identified in only some of the factor series and the trends of these series and the series of GHG emissions for the respective countries' sets are not identical, there is no basis to expect a significant overestimation of the correlation between emissions and autocorrelated factors (Velichkova, 1981). Thereafter, serial correlation caused by autocorrelation in the initial series was controlled when it was necessary.

Correlation coefficients between Greenhouse gas emissions and circular economy indicators are presented in Table 3. Values in brackets are p-values of the tests for statistical significance of respective correlation coefficients at 5% significance level.

Table 3

Correlation coefficients between Greenhouse gas emissions and circular economy
indicators

Cincular Economy, Indicators	Groups of countries			
Circular Economy indicators	EU-28	EU-15	EU-13	Bulgaria
Circular material use rate	-0,6447*	-0,2562	0,0595	0,1628
Circular material use rate	[0,0442]	[0,4748]	[0,8702]	[0,6532]
Enorgy productivity	-0,8200*	-0,9185*	0,1881	-0,1902
Energy productivity	[0,0037]	[0,0002]	[0,6028]	[0,5987]
Resource productivity and domestic material consumption	-0,8264*	-0,9190*	-0,1377	-0,4099
(DMC)	[0.0032]	[0,0002]	[0,7045]	[0,2394]
Production, value added and exports in the environmental	0,4795	-0,4949	0,5503	0,0871
goods and services sector	[0,1607]	[0,1459]	[0,0993]	[0,8107]
Generation of waste excluding major mineral wastes by	0,0292	0,8243*	0,3986	0,1098
hazardousness	[0,9361	[0,0034]	[0,2538]	[0,7627]
Desculing note of all worth, avaluding major minaral worth	-0,8302*	0,1924	0,4131	0,1634
Recycling rate of all waste, excluding major mineral waste	[0,0029]	0,5943	[0,2354]	[0,6520]

* Statistical significance proven at 5% significance level

Source: own elaboration

There is a strongly presented negative correlation between *Greenhouse gas emissions* and 4 of circular economy indicators – *Circular material use rate, Energy productivity, Resource productivity and DMC* and *Recycling rate of all waste, excluding major mineral waste*, for the group of all EU countries. A very strong negative correlation is also presented between *Greenhouse gas emissions* and *Energy productivity* and *Resource productivity and DMC* for the old EU members. It shows concerning EU countries as a whole and the group of old members that both latter indicators are closely related to *Greenhouse gas emissions* like the indicators increase causes emissions decrease. The empirical result confirms the initial research hypothesis that accelerating ecological transformation, transition to a circular economy model, increase resource efficiency and resource re-use based on the 3Rs (reduce, re-use, recycle) rule can have a positive impact on emissions reduction and support efforts in the fight of climate change. On the other hand, there is a strong positive correlation between *Greenhouse gas emissions* and *Generation of waste excluding major mineral wastes by hazardousness* for the group of the old EU members. Closing the circle and striving for zero

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waste is at the heart of the circular economy concept. Introducing new production technologies with zero-waste or producing products with an eco-design that allows them to be more easily disassembled, using the useful components, and thus reducing waste, has a double dividend. In purely economic terms, it reduces production costs and in terms of environmental effects, it leads to a drop in greenhouse gas emissions. An important outcome here shows that the correlation between *Greenhouse gas emissions* and the indicators analysed cannot be proven for the new EU members, including Bulgaria. One of the reasons could be looked for in yet weak development of circular economy in these countries and thus, in lower levels of the respective indicators.



Results of all the applied Unit Root tests showed almost the same results, that is why only the results of ADF tests are presented in Table A1 in the Appendix. *Greenhouse gas emissions* time series for EU-28, EU-15 and EU-13 are integrated at a high level (3^{rd} and above) and only this one for Bulgaria is not. Also, most of the factor variables turned to be integrated of a different order – I (1), I (2) or I(3). Analysing the results and taking into account the limited size of time series used, we supposed that it is likely outcomes of unit root tests not to be reliably enough. Moreover, models created using series differences could not fit well with empirical data, most of the models' parameters are not statistically significant and the explanatory capability of the models (presented by R-square) is very weak. The outcomes are not presented in the paper, but they are available in request from the authors. The outcomes of the last estimated models created using regARIMA approach and the Stepwise LS method for factors selection are presented below.

3.1. Model for the group of all EU members, including the UK (EU-28)

Taking under consideration correlations proven between the dependent variable and the initially specified factors and after running the Stepwise Least Square Method, the final (best) view of the model of *Greenhouse gas emissions* estimated for the group of all the EU members (EU-28) is:

$$\hat{Y} = c(0) + c(1)^* X6 + c(2)^* MA(1)$$
(1)

where: \hat{Y} is *Greenhouse gas emissions* estimated; X6 is the *Recycling rate of all waste excluding major mineral waste;* c(0), c(1) and (2) are model parameters; MA(1) is the moving average term of residuals

Model fit well empirical data and the diagnostic tests provide evidences for normally distributed residuals with 0 mean, lack of serial correlation and heteroscedasticity. The explanatory capability of the model is 89.9%. Estimates of model parameters with important statistics for their quality are presented in Table 4. There is only one factor with a statistically significant effect on the *Greenhouse gas emissions* in the model – *The recycling rate of all waste, excluding major mineral waste.* The main reason for removing the rest of the initially specified factors from the model is the strong multicollinearity between them that yield unstable parameter estimates and conservative tests for their statistical significance. The effect of the factor is negative and shows that the average reduction of *Greenhouse gas emissions* for 1% increase in the *Recycling rate of all waste* will expect to be 0.162 tonnes per capita.

Table 4

Variable	Coefficient	Std. Error	t-Statistic	Prob.(t)
X6	-0.1616	0.0468	-3.447	0.0107
С	16.7756	2.3829	7.039	0.0002
MA(1)	0.9322	0.0652	14.286	0.0000

Model estimation outcomes for EU-28

Source:	own	elai	boration
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3.2. Model for the group of old EU members, including the UK (EU-15)

The Final (best) model of *Greenhouse gas emissions* estimated for the group of the old EU members (EU-15) is:

$$\hat{\mathbf{Y}} = \mathbf{c}(0) + \mathbf{c}(1)^* \mathbf{X} + \mathbf{c}(2)^* \mathbf{X}$$
 (2)

where: \hat{Y} is *Greenhouse gas emissions* estimated; X2 is *Energy productivity;* X5 is the *Generation of waste excluding major mineral wastes by hazardousness*; c(0), c(1) and (2) are model parameters

Four of the initially specified factors are removed from the model since they show statistically insignificant effects on GHG emissions. One of the reasons could be strong multicollinearity existed between them. Estimates of model parameters and main statistics that prove their

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quality are presented in Table 5. Parameters of factors included in the model are statistically significant. Model fit well empirical data and all the diagnostic tests provide evidences that the assumptions about the residuals are met. The explanatory capability of the model is 97.4%. The effect of *Energy productivity* is negative and shows that the average reduce of *Greenhouse gas emissions* will expect to be 0.6062 tonnes per capita for 1 Euro per KGOE increase in *Energy Productivity*. Effect of *Generation of waste excluding major mineral wastes by hazardousness* is positive and means that *Greenhouse gas emissions* will expect to increase of *waste generated*.

Table 5

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X2	-0.6062	0.0682	-8.888	0.0000
X5	0.0029	0.0004	5.912	0.0006
С	9.2072	1.4367	6.408	0.0004

Model estimation outcomes for EU-15

Source: own elaboration

3.3. Model for the group of new EU members (EU-13)

Final (best) specification of the model of *Greenhouse gas emissions* estimated for the group of the new EU members (EU-13) is:

$$\hat{Y} = c(0) + c(1)^* X2 + c(2)^* X4 + c(3)^* X5$$
(3)

where: \hat{Y} is *Greenhouse gas emissions* estimated; X2 is *Energy productivity*; X4 is *Production, value added and exports in the environmental goods and services sector*; X5 is *Generation of waste excluding major mineral wastes by hazardousness*; c(0), c(1), c(2) and c(3) are model parameters

Three of the initially specified factors are included in the model. Due to the strong multicollinearity between factors, three of them, X1, X3 and X6, are removed from the model. Thus, in the final specification, all the parameters are statistically significant and the model fits well empirical data. All the diagnostic tests provide evidences that the assumptions about the residuals are met. The explanatory capability of the model is 88.4%. Estimates of model parameters with important statistics for their quality are presented in Table 6.

Table 6

			-	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X2	-1.583368	0.293319	-5.398109	0.0017
X4	6.19E-05	1.40E-05	4.424038	0.0045
X5	0.004710	0.000873	5.393367	0.0017
С	5.200979	0.658178	7.902087	0.0002

Model estimation outcomes for EU-13

Source: own elaboration

There is a negative effect of *Energy productivity* on the *Greenhouse gas emissions*. The average reduce of emissions will expect to be 1.675 tonnes per capita for 1 Euro per KGOE

increase in *Energy Productivity*. On the other hand, there is a positive effect of *Generation* of waste excluding major mineral wastes by hazardousness on the Greenhouse gas emissions and an average increase of emissions will expect to be 0.0047 tonnes per capita for 1 Kg increase of waste generated. The effect of *Production, value added and exports in the* environmental goods and services sector on the Greenhouse gas emissions is positive but almost zero. Actually, this economic sector is yet too weakly developed, particularly in most new EU members. Likely it is the reason for such a weak effect presented in the model.

3.4. Model for Bulgaria alone (BU)

Final (best) specification of the model of *Greenhouse gas emissions* estimated for the group of the new EU members (EU-13) is:

$$\hat{Y} = c(0) + c(1)*X2 + c(2)*X4$$
(4)

where: \hat{Y} is *Greenhouse gas emissions* estimated; X2 is *Energy productivity*; X4 is *Production, value added and exports in the environmental goods and services sector*; c(0), c(1) and c(2) are model parameters

There are only 2 of initially specified factors that are selected in the model of *Greenhouse* gas emissions for Bulgaria. The main reason here is again strong multicollinearity between factors but another reason could be looked for in insufficient development of sectors that are related to the circular economy and promote a low-carbon economy. All the parameters in the final model specification are statistically significant and the model fits well with empirical data. All the diagnostic tests provide evidences that the assumptions about the residuals are met. The explanatory capability of the model is 88.4%. Estimates of model parameters with important statistics for their quality are presented in Table 7.

Table 7

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X2	-61.32133	12.94908	-4.735576	0.0021
X4	0.011672	0.002899	4.026236	0.0050
С	180.7251	24.77203	7.295529	0.0002

Model estimation outcomes for EU-13

Source: own elaboration

Factors with a significant effect on *Greenhouse gas emissions* in Bulgaria are *Energy productivity* and *Production, value added and exports in the environmental goods and services sector*. The first factor has a rather strong negative effect on the emissions and the expected average reduction of emissions is 61.321 tonnes per capita for 1 Euro per KGOE increase in *Energy Productivity*. The effect of the second factor is rather smaller and positive, that means 0.0116 tonnes per capita expected average increase of emissions for 1 Million Euro increase of *production, value added and exports in the environmental goods and services sector*.

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4. Conclusions

In this study, we aim to identify the components of the circular economy that support sustainability with a positive impact on greenhouse gas emissions reduce. The circular economy is defined as an economic system applicable at both micro and macro levels, with a focus on the 3Rs – reduce, re-use, recycle and recover – of materials in production and consumption activities to achieve sustainable development. Analysing the results of the four developed models for the respective defined groups of EU countries, it can be stated that the original research hypothesis is proven, and all the selected indicators have a more or less significant impact on the reduction of emissions, but their effects are expressed in different degree for the EU Member States. Production, value added and exports in the environmental goods and services sector seems to cause the smallest effect on the Greenhouse gas emissions. Energy Productivity is one of the most important factors for reducing Greenhouse gas emissions and transition to a low-carbon economy in all the EU countries.

The transformation from linear to a circular economy model causes a positive impact on the reduction of GHG emissions. This is particularly true for the EU-15 group, where some countries have had significant success and implemented new business models related to the transition to a more resource-efficient, less waste-generating and greener economy. In the EU-13 group, the indicators of the circular economy show a weaker effect on the GHG emission reduce. In these catching-up countries with not very well-developed circular economy infrastructure there is a lag and a slowdown in environmental transformation. Most of them have a per capita GHG emissions performance below the EU average, but still, above the 2050 net-zero emissions target, public policy reform to promote the transition to a circular economy needs to be accelerated in these countries. Research outcomes strongly support the fact that the circular economy should be promoted by key stakeholders (academia, government, business, and civil society) in order to promote a sustainable, green economy. The study highlights the need for more widespread implementation of CE models as an opportunity to accelerate the EU environmental transformation and achieve the ambitious 2050 targets. In order to successfully meet the EU's 2030 low carbon and resource efficiency targets, the transition to a circular economy model should become a governments priority. This implies extending the concept not only to waste reduction and recycling, but to break the dependency between economic growth and waste production as well as resource consumption.

For the transition to a clean, green, and environmentally friendly industry to be effective, more committed and adequate actions are needed from governments, especially in the newly acceded countries. This requires workable programs with clear purposes and tools to achieve them. Such strategy must necessarily cover measures as follows:

• Advance projects (including economic incentives) involving technological innovation of processes, new products and materials resulting in 'greening' industrial productions and lengthened life cycle of products. It is necessary to create more incentives for projects that favour the use of less resources, allow longer product life cycle, easier repair and recycling of the products as well as sustainable development of innovative start-up system and innovation clusters.

- Upgrading development of enterprises innovation activity. Grant support needs to focus
 on the risky part of investments in this area with a focus on creating new products and
 services, technologies transfer and commercialisation, strengthening collaboration with
 knowledge-generating units and businesses, and ensuring full participation in the
 development of the scientific and innovation ecosystem.
- Create a favourable environment for increasing involvement in a separate collection of
 waste by both consumers and producers. This would facilitate the supply of quality
 material for recycling and considerably enhance the efficiency of the process.

Authors regard this study as a first attempt to analyse empirically the correlation between the transition to the circular economy and the reduction of GHG emissions, using econometric models. Considering the short time series available up to now for most of the indicators included in the study and missing data for some of the countries, in addition, the models developed will be validated in future using data for the next years. Future confirmation of the research hypothesis and of the results obtained by now is a challenge for further authors' research. This will enhance arguments for promotion and imposing the circular economy concept, especially in EU countries, most of which yet underestimate potential impacts.

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APPENDIX

Table A1

Results of ADF	tests for	stationarity	of the	variables

	Variables	Groups of countries					
	variables	EU-28	EU-15	EU-13	Bulgaria		
Y	Greenhouse gas (GHG) emissions	I(3)	I(3)	I(3)	I(0)		
X1	Circular material use rate	I(3)	I(3)	I(0)	I(2)		
X2	Energy productivity	I(2)	I(1)	I(0)	I(0)		
X3	Resource productivity and domestic material consumption (DMC)	I(2)	I(0)	I(0)	I(3)		
X4	Production, value added and exports in the environmental goods and services sector	I(2)	I(2)	I(3)	I(2)		
X5	Generation of waste excluding major mineral wastes by hazardousness	I(1)	I(3)	I(2)	I(2)		
X6	Recycling rate of all waste excluding major mineral waste	I(1)	I(3)	I(3)	I(2)		

Table A2

First order Autocorrelation coefficients of the variables in the models

	Variables		Groups o	of countries	;
	variables	EU-28	EU-15	EU-13	Bulgaria
v	Creambauga and (CHC) amigging	0.4	0.51	0.22	0.22
I	Greenhouse gas (GHG) emissions	[0.141]	[0.060]	[0.419]	[0.406]
V 1	Circular material use rate	0.46	0.4	0.52	0.59
ЛІ	Circular material use rate	[0.087]	[0.135]	[0.056]	[0.031]
v2	Energy productivity	EU-28 EU-15 EU-13 Bulga 0.4 0.51 0.22 0.22 $[0.141]$ $[0.060]$ $[0.419]$ $[0.40]$ 0.46 0.4 0.52 0.52 $[0.087]$ $[0.135]$ $[0.056]$ $[0.03]$ 0.6 0.66 0.61 0.55 $[0.018]$ $[0.016]$ $[0.025]$ $[0.03]$ 0.6 0.65 0.21 0.16 $[0.021]$ $[0.017]$ $[0.429]$ $[0.55]$ 0.28 0.44 0.5 0.67 $0.306]$ $[0.103]$ $[0.066]$ $[0.01]$ 0.52 0.53 0.67 0.66 0.52 0.53 0.67 0.66 $0.054]$ $[0.052]$ $[0.014]$ $[0.022]$	0.59		
ΛΔ	Energy productivity	[0.018]	[0.016]	[0.025]	[0.031]
V 2	Resource productivity and domestic material consumption	0.6	0.65	0.21	0.16
ЛЗ	(DMC)	[0.021]	[0.017]	[0.429]	[0.558]
VЛ	Production, value added and exports in the environmental	0.28	0.44	0.5	0.67
Λ4	goods and services sector	[0.306]	[0.103]	[0.066]	[0.013]
V5	Generation of waste excluding major mineral wastes by	0.52	0.53	0.67	0.6
ЛЈ	hazardousness	[0.054]	[0.052]	[0.014]	[0.028]
¥6	Recycling rate of all waste evoluting major mineral waste	0.65	0.55	0.73	0.35
ло	Recycling fale of an waste excluding major mineral waste	[0.016]	[0.044]	[0.007]	[0.199]



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Volume 31(6), 2022

THE ROLE OF GAS INTERCONNECTIONS IN THE ENERGY SECURITY OF SOUTH-EAST EUROPE³

The Russian-Ukrainian dispute over the natural gas transit and the subsequent disruptions in natural gas supply to some countries in South-East Europe (SEE) in 2006 and 2009 attracted considerable public and academic attention and it wouldn't be overstated to say that they have changed the direction of the entire energy policy of the European Union. Sixteen years after the first gas crisis, in light of the current energy crises and the military conflict between Ukraine and the Russian Federation, this paper attempts to illustrate the trends in the natural gas sector development in South-East Europe, to evaluate whether and how the role of the Russian natural gas supplies in the region's energy security has changed and to examine what measures have been taken for the security of natural gas supplies in the region over the years. The results show that although the amount of Russian natural gas delivered to the SEE countries still represents the greatest share of their total gas supplies, concerns over possible disruptions have been addressed by developing the interconnectivity in the region and commissioning new infrastructure creating alternative options for the routes and sources of supply. Nevertheless, there is still what to expect in regard to interconnectivity and market integration of the Western Balkans.

Keywords: South-East Europe; Energy security; Security of Natural gas supplies; Economics of Natural gas sector; EU Energy policy JEL: Q4; F5

1. Introduction

Geographically, South-East Europe (SEE) lies between two parts of the world, both of which play an important role in the global energy economy – the Black Sea region, Central Asia and the East Mediterranean, with their rich energy resources and potential, and the vast energy markets of Western and Central Europe. Thus, the region is becoming an even more important energy resources transit centre. Nevertheless, insufficient attention is paid to the development of the energy potential of South-East Europe itself and its significance for the

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³ This paper should be cited as: *Zhiznin, S., Dineva, V. (2022). The Role of Gas Interconnections in the Energy Security of South East Europe. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 38-59.*

socio-economic development of countries there. For the purpose of this study, South-East Europe comprises six Contracting Parties to the Energy Community Treaty – Albania, Bosnia and Herzegovina, Kosovo⁴, Montenegro, Serbia and the Republic of North Macedonia, as well as four members of the EU – Bulgaria, Greece, Croatia and Romania (three-letter country codes (alpha-3) as in (ISO 3166, 2020) are used in the figures for convenience instead of the full official names of the analysed countries).

Countries in the region are neither main energy producers, nor large consumers. Although there are some deposits of fossil fuels, these resources are not significant. The region depends on imports and limited local resources such as hydropower, lignite, as well as biomass energy. The diverse energy scene is characterised not only by market disparities in terms of population, economic development and energy infrastructure, but also by the region's dependence on energy imports (Dineva, 2020).

The region as a whole is a net energy importer, importing about 52 Mtoe in 2018 or about 63% of its total final energy consumption (82 Mtoe) (Dineva, 2020). This number has barely changed over the last 20 years. Local sources provide about 85% of lignite, 20% of oil and 50% of natural gas in SEE. Lignite is widely available in the region, providing a cheap but polluting energy resource and being key for the functioning of the economy for many countries in the region. Although there are certain efforts at a global scale to improve the ecological aspects of the coal industry through "clean coal technologies" (in the USA, India and China in particular) (Zhiznin, Cherechukin, 2019), introducing such technologies in the SEE countries is limited and expensive, and currently does not appear to be an option.

Over the past two decades, natural gas has been considered a cleaner energy substitute for coal in the region, so the efforts of the local governments have been focused on increasing gasification and ensuring that gas supplies meet their country's needs. Due to its geographical location, historically, the region has been an area of geopolitical contentions. Thus, the Russian-Ukrainian dispute over the natural gas transit and the subsequent disruptions in natural gas supply from Russia to some countries, primarily in South and East Europe, in 2006 and 2009 attracted considerable public and academic attention.

These events undermined the historical partnership on energy matters between Russia and the EU. The two gas crises crossed out the previous 40 years of stability and continuity of supply. Both Russia and Ukraine suffered serious damage to their reputations as a supplier and transit countries, respectively, as well as substantial financial losses (Dineva, 2020). European vulnerability and the necessity to increase energy security in Europe have been highlighted by these events and it would not be exaggerated to say that the 2006 and 2009 events have changed the direction of the entire energy policy of the European Union.

Since then, the natural gas security of South-East Europe has been shifted to the top of the energy policy agenda both at the European and national levels. Considering the time elapsed since these events took place, the current escalated situation in Eastern Europe and the new European energy–climate paradigm, it is relevant to follow the developments in the security

⁴ This designation is without prejudice to positions on status and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

of gas supply measures applied in South-East Europe as well as the possible role of the natural gas in the energy transition of the region.

For the purpose, this study contains a qualitative evaluation of energy security and some quantitative indicators (some problems of the quantitative evaluation of energy security are discussed in details in (Zhiznin et al., 2020)), and includes a discussion of some relevant aspects of the Green deal, examination of the natural gas markets, demand and indigenous production of natural gas in South-East Europe, sources of supply and transportation infrastructure development in the region (existing, planned and under construction).

2. Literature Review

A number of studies have been devoted to the subject of Energy security over the years, including its theoretical formulation and the methods for its assessment.

Frameworks for analysing national energy security policies and performance are suggested by Sovacool, Mukherjee (2011); Winzer (2011); Buzan et al. (1988); Cherp, Jewell (2014).

Baumann, F. (2008); Bohi, D. et al. (1996); Kruyt B. et al. (2009); Labandeira X., Manzano B. (2012); as well as Le Coq C., Paltseva E. (2009), analyse the economic aspect of Energy security and propose indicators for its quantitative evaluation

The European context of Energy security is discussed by Lilliestam, J., Patt, A. (2012); Noel P., Findlater S. (2010); Vicini, G., et al. (2005); Seliverstov S. (2007); Simonija N. A., Torkunov A. V. (2014); Skalamera M. (2015); Zhiznin, S. Z. (2010); Rodríguez-Fernández, L., et al. (2020).

Most of the available literature, however, does not cover South-East Europe as one region, but either discusses the EU Member States in the region, or the so-called Western Balkan countries. Studies which do consider the region as one whole and are of particular relevance to this paper are Giamouridis, A., Paleoyannis (2011); Dickel, R. et al. (2014); Afgana, N. A. et al. (2007); Franki, A., Višković, A. (2015); Morningstar, R. L., et al. (2020); Kovács, K. (2017); Khalova, G. O., et al. (2019); Cohen, G. (2019), which analyse energy security and policy in South-East Europe in particular.

3. Methodology

This is an analytical study, which represents a mixed methods research, combining quantitative and qualitative research methods. The results obtained through this combination can enhance the comprehension of the objects of study and possibly clarify questions that are challenging to address by applying only one method (Lopez-Fernandez, Molina-Azorin, 2014). This approach is appropriate for interdisciplinary studies such as the energy policy and security examination, which comprises economic, policy and security elements.

3.1. Qualitative methods

The qualitative analysis in the paper is performed through a comprehensive data review of the most recent sources regarding the sources of supply and the existing and planned infrastructure for natural gas transportation and storage. The main sources of information are official government publications and communications of the European Commission and notifications of the Transmission system operators. These data are complemented with press releases, news and other online announcements.

A map of the interconnections in SEE is used to illustrate the current state of interconnectivity in the region. The information used for the creation of the map is compiled from ENTSO-G Transmission Capacity Map 2019, the Gas Transmission System Operators of the SEE countries and reliable media publications.

3.2. Quantitative methods

The quantitative data for the analysis of Primary energy supply and natural gas demand and supply sides are presented in graphical and table forms.

Data for the total primary energy supply are collected from the IEA opensource database (IEA,2021). Natural gas consumption and proven gas reserves are compiled using CIA World Factbook data (CIA World Factbook data, 2021). Natural gas prices in the SEE countries are collected from Eurostat (Eurostat, 2021).

Gazprom Export official information is used for crating Table 1 containing the natural gas quantities supplied by Gasprom in 2019. The estimations for potential gas reserves in the region are compiled from governmental press releases and open source information.

In order to make some estimations of the overall energy security, two of the widely used indicators for measuring energy diversity and concentration are applied for the region of South-East Europe: the Shannon-Wiener Index (SWI) and the Herfindahl-Hirschman Index (HHI). The formulas for calculating the two indicators (Park, Bae, 2021; Chalvatzis, Ioannidis, 2017) are as follows:

$$\text{HHI}=\sum_{i=1}^{n}(s_i \times 100)^2 \tag{1}$$

$$SWI = -\sum_{i=1}^{n} s_i \times \ln s_i \tag{2}$$

where s_i is the share of primary energy supply of each available energy source in the total primary energy supply and n is the number of options. The HHI index highlights abundant energy resources and the lower the value of the HHI, the higher the diversity. The higher the value of the SWI index, the higher the diversity.

4. Some Relevant Aspects of the European Green Deal

A brief overview of the EU Energy policy and, more precisely, the European Green Deal as a framework which would determine the direction of this policy in the next decades will give

a context to the analysis of the role of natural gas in the energy mix of the South-East European countries.

Since the presentation of the EU Green Deal in December 2019, a number of legislative proposals, including in the energy sector, have been developed by the Commission (e.g. *the EU strategy on energy system integration, Renovation Wave for Europe, Hydrogen strategy for a climate-neutral Europe, etc.*). As part of the Green Deal, *the European Climate Law* (Regulation (EU) 2021/1119) (in force since June 2021) sets a binding target of achieving the reduction of net greenhouse gas emissions by at least 55% by 2030 compared to 1990 and envisages EU climate neutrality by 2050. This requires current greenhouse gas emission levels to drop substantially in the next decades.

In order to adapt its current legal framework to the 2030 and 2050 ambitions, the EU is working on the revision of its climate, energy and transport-related legislation under the *Fit for 55 package*, which also includes a few new proposals (European Council, 2021). There are several new developments which are worth noting here:

- EU level goal of at least 40% renewable energy sources by 2030 according to the 2021 proposal for revision of *the 2018 Renewable Energy Directive* (European Commission, 2021a);
- Binding targets at the EU level for reducing primary and final energy consumption by 2030 39% and 36% accordingly according to the Commission's proposal (European Commission, 2021b) for recasting the whole 2018 Energy Efficiency Directive (Directive (EU) 2018/2002);
- Introduction of the Carbon border adjustment mechanism (CBAM) for prevention of the risk of carbon leakage and under which EU importers will have to buy carbon certificates equivalent to the carbon price under the EU's carbon pricing rules. The mechanism is planned to progressively become an alternative to the EU's Emissions Trading System (ETS);
- Reduction of the overall emission cap and of the surplus of emission allowances in the carbon market, which will lead to declining in the number of free allowances for all sectors over time, as envisaged in the new revision of the EU ETS Directive (Directive (EU) 2018/410).

One of the measures intended to facilitate the redirection of finance towards environmentally sustainable activities on the territory of the EU is *the EU Taxonomy Climate Delegated Act* (Regulation (EU) 2020/852) (formally adopted in June 2021). In order to clarify which economic activities most contribute to reaching the environmental goals of the European Union, the Commission has identified a list of 88 activities which are considered environmentally sustainable as well as detailed criteria they have to meet in order to be labelled as a green investment.

Natural gas and nuclear energy were not included in this list as they appeared to be the most controversial aspects of the taxonomy over which the EU countries are divided. However, considering the recommendations of the Technical expert group (TEG) advising the European Commission on sustainable finance (European Commission, 2020) and *the*

Technical report of the Joint Research Centre (JRC) (European Commission Joint Research Centre, 2021), on February 2nd the Commission presented the final version of the Complementary Delegated Act of the EU Taxonomy Regulation which covers nuclear and gas activities (European Commission, 2022). The document acknowledges both energy sources as contributing to the transition to climate neutrality. However, the positions of the Member States regarding the Delegated Act are fundamentally different. While some countries are strictly against the inclusion of these activities in the Taxonomy, others are disappointed from treating nuclear and natural gas as transitional fuels as well as from some of the conditions envisaged in the document.

5. Results And Discussion

5.1. Composition of the Total primary energy supply in the region

The countries with the largest population and GDP in the region are Romania, Greece, Bulgaria and Serbia are also, as might be expected, the largest energy consumers (Figure 1). About 90% of the SEE's total primary energy supply (both in 2006 and 2018) is used by these four countries and they play a substantial role in the formation of the region's average calculations. On the other hand, Montenegro, Kosovo, Albania and the Republic of North Macedonia are the countries with the least contribution to the region's primary energy supply.





Total primary energy supply contribution in SEE for 2006 and 2018

Source: Author's own calculations based on IEA Energy Statistics data.

The overall total primary energy supply (TPES) in South-East Europe has decreased by 13% – from 130.96 Mtoe in 2006 to 113.91 Mtoe in 2018 (IEA, 2021). Such a negative trend is observed in most of the countries in the region and their reduction percentage ranges from -9.5% in Bulgaria to -28.9% in Greece. There are a few countries, however, which have increased their primary energy supply – Albania (17%), Bosnia and Herzegovina (43.5%), Montenegro (10.5%) and Kosovo (13%) (IEA, 2021).

In the globalised and highly interdependent modern world, the diversity of energy resources is becoming a more and more important aspect of energy security. The EU has adopted a long-term strategy for energy diversity within the context of decarbonisation policies in order to reduce its reliance on fossil fuels. Figure 2 shows the composition of SEE's total primary energy supply in 2006 and 2018.





Total Primary Energy Supply by source in %, 2006 and 2018

Source: Author's own calculations based on IEA Energy Statistics data.

Two of the widely used indicators for measuring energy diversity and concentration are applied for the region of South-East Europe: the SWI and the HHI (as described in more details in the Methodology Section). Seven primary energy sources have been considered in the calculations for the region as a whole: coal, oil, natural gas, nuclear, hydro, biofuels and renewables. However, this number varies from n=4 to n=7 for the individual countries, depending on the composition of their TPES.

The region considerably improved its energy sources diversity with an increase of SWI by 10.3% and a decrease of HHI by 15.5% since 2006. To a large extent, this improvement is connected to two factors:

- First, the substantial decrease in coal (by approx. 1/3) and oil (by approx. 1/4) consumption and the decreasing trend in natural gas use (Figure 2);
- Second, the introduction and wider use of renewable energy sources in all countries in the region (although "*Other RES*" do not appear in the official energy statistics for Kosovo* for 2018, the country's first major wind farm started operation in late 2018 and 2019), but especially in the EU Member States in the region, and this growing trend (considering the present decarbonisation policies) will probably contribute to the further diversity improvements in future (Figure 2).

Despite the considerable reductions in the use of coal and oil, both fuels are still dominant in the TPES structure of the region (Figure 2).

Romania and Bulgaria are the counties with the most diverse and balanced fuel mix as they use a maximum of seven energy sources available in the region, including nuclear power. This is also depicted in their SWI and HHI indexes (Figure 3). They are also respectively first and third in terms of shares in the regional TPES (Figure 1).



Source: Author's own calculations based on IEA Energy Statistics data.

Kosovo, Bosnia and Herzegovina and Albania are the countries with the least diverse energy mix, mainly due to their heavy reliance on one or two sources – coal and/or oil. They are also the countries with the smallest shares in the total primary energy supply of the region – each of them is accountable for 2%. Croatia also has a 2% share in the regional TPES, but its fuel mix is much more balanced, and this is reflected in the indicators.

Natural gas final consumption in SEE (TJ), 2005-2018

Figure 5

Figure 3



Source: Compiled by the author based on IEA Energy Statistics data

Albania, Greece and the Republic of North Macedonia have achieved the greatest improvement in their energy sources diversification over the period 2006-2018, by decreasing HHI respectively by 30.9%, 20.4% and 20.0%, and increasing SWI by 37.5%, 20.6% and 17.6% (Figure 3). The least progress in terms of diversification have Montenegro

(decreasing HHI by 3.5% HHI and increasing SWI by 4.1%) and Serbia (decreasing HHI by 8.5% and increasing SWI by 6.8%) (Figure 3).

There has been an overall negative trend in the natural gas final consumption in the region since 2005 (Figure 5), as the difference between the gas consumed in 2005 and 2018 is about 15%. This tendency is valid for all individual countries in the region, as only some minor increase is observed in Albania.

5.2. Sources and routes of natural gas supply

Natural gas enters South-East Europe either via pipelines or as liquefied natural gas (LNG) via LNG terminals. The largest share of gas imports comes from Russia. A detailed examination of the natural gas infrastructure in the region – existing, under construction and planned, as well as the current and potential sources of supply are further provided.

Russian supplies

The main natural gas supplier of the SEE countries is Russia. It made its first deliveries to the region (and more precisely – to Bulgaria) in 1974. Until recently, the region used to receive Russian supplies exclusively via the pipeline system through Ukraine.

The Soyuz gas pipeline along the Orenburg-Western border of the USSR route was built after the signing of the Orenburg Agreement. It was put into operation in 1980 and its design capacity is 26 Bcm/y. The gas transported through this pipeline has been delivered in South-East Europe in 3 directions – to Slovakia (from there, it could be transported to Slovenia and Croatia via Austria), to Hungary (from there, it could be transported to Serbia and Bosnia and Herzegovina) and to Romania.

Another route of the Russian gas transit to South-East Europe through Ukraine is Romania (via Moldova). The construction of the Transbalkan pipeline began in 1986 and it has been supplying gas to Bulgaria, Greece, the Republic of North Macedonia and Turkey through the territory of Romania (Gazprom Export, 2021b).

After the commissioning of the TurkStream, the function of the Trans-Balkan Pipeline changed. Since January 1st 2020, Bulgaria has been receiving Russian gas through the new entry point Strandzha 2, at the border between Bulgaria and Turkey (Darik news, 2019). Additional gas quantities enter Bulgaria through this new entry point in order to be transported further to Greece, the Republic of North Macedonia and Romania.

In July 2019, it was announced that the second branch of the TurkStream will pass through Bulgaria, Serbia and Hungary (BTV Novinite, 2021). Although this project, along with Nord Stream 2 (some geopolitical and economic aspects of this project are presented in (Zhiznin, Timokhov, 2019)), have been included in the US Countering America's Adversaries Through Sanctions Act (CAATSA), on January 1st 2021, Serbia officially commissioned the Balkan stream at its territory (Gazprom Export, 2021a).

Figure 8

Russian Natural gas supply to SEE prior and after to the commissioning of TurkStream and its continuation Balkan Stream



Source: Compiled by the author.

To summarise, 9 out of 11 countries in South-East Europe are receiving natural gas from Russia – Albania, Montenegro and Kosovo being the only exceptions (Table 1). Table 1

Country	Imports from Russia (bcm), 2019	
ALB	0	
BIH	0,18	
BGR	2,39	
HRV	2,82	
MKD	0,29	
GRC	2,41	
MNE	0	
ROU	1	
SRB	2,09	
Kosovo*	0	
REGION	11,18	

Natural gas quantities supplied by Gazprom to SEE countries, 2019

Source: Compiled by the author based on Gazprom Export official data.

Caspian supplies

The Southern Gas Corridor is a relatively new route which was assigned with the mission to shift the balance of natural gas trade flows and diversify the supply portfolio not only in South-East Europe, but in the European Union as a whole. Being a priority project of the EU, this complex system of pipelines has been constructed for less than 5 years and aims to increase and diversify the energy supply by transporting gas from the Caspian region.

Since the end of 2020, the Southern Gas Corridor has been able to bring a further 16 Bcm/y (of which 6 Bcm are for the Turkish market and the remaining 10 for South Europe) from the Shah Deniz field in Azerbaijan through the South Caucasus Pipeline and its expansion, the

Trans-Anatolian Natural Gas Pipeline (TANAP) and the Trans Adriatic Pipeline (TAP) to the European markets. The total length of the pipeline system is more than 3,200 kilometres and costs about US\$40 billion (Southern Gas Corridor, 2021). There are plans to include also the Trans-Caspian Pipeline (TCP), which could enable the export of Turkmen gas. However, the inclusion of Turkmenistan and Iran in this corridor is only speculative at this stage.

The first Azeri gas was delivered to Greece and Bulgaria on December 31st 2020. It has entered Greece at the connection point between TAP and via the Greek national transmission network. At first, Bulgaria will receive gas through the existing gas link between Bulgaria and Greece (the Kula-Sidirokastro pipeline) and afterwards, gas will flow through the planned Bulgaria-Greece Interconnector (IGB). The current contracts envisage delivery of 1Bcm/y to Greece and Bulgaria each, and 8Bcm/y to Italy (S&P Global Platts, 2020).

Moreover, Croatia, Albania, Montenegro, Bosnia and Herzegovina and possibly Kosovo may have the opportunity to receive natural gas through the Southern Gas Corridor in future via the proposed Ionian-Adriatic Pipeline (IAP). However, this project is still at a very early stage, so realistically, these Western Balkan countries are not expected to benefit from the Azeri gas anytime soon (a more detailed analysis regarding the planned gas pipeline projects in SEE is presented further below).

The Southern Gas corridor was, without doubt, a very technically challenging project, spanning seven nations, and there are huge expectations regarding its impact on the European gas market. Nevertheless, it is controversial to what extent it would be commercially meaningful in the future, considering the new EU energy and environment goals and the fact that the role of natural gas in the future energy mix is still being debated.

Moreover, the energy security purpose of the SGC could also be questioned to a certain degree, taking into account the participation of Lukoil with a 10% share in the project, as well as the possibility for Gazprom to book capacity in the expansion of the Trans Adriatic Pipeline (TAP). TAP was granted a third-party access exemption under the EU 2009 gas directive (Regulation (EC) No 715/2009) only for its original capacity of 10 Bcm/y (1/2 of the planned extended capacity of 20 Bcm/y), which gives permission to the Azeri gas suppliers to fully book this capacity (Stein, 2019).

This raises questions about the EU energy strategy coherence and whether the investments in the Southern Gas Corridor could not have been better allocated to energy efficiency measures in Central and South-East Europe, where countries are most vulnerable to any future gas import disruptions (Stein, 2019).

5.3. Regional interconnectivity

South-East Europe has been perceived as the weakest link in the quest for European Energy security. The region used to be characterised by the absence of interconnecting gas infrastructure, allowing gas to flow not only between the economies of the region but also between South-East Europe as a whole and the rest of the European Union.

However, the gas infrastructure map of the region has substantially changed over the last decade. Apart from the numerous long-distance gas pipelines (already commissioned or

planned), a number of smaller-scale developments have been realised in SEE, which could have a greater impact on the region's gas market.

A potential game-changer in the SEE are the gas interconnections between the individual countries (existing and planned). At present, there are 14 existing cross-country interconnection points in the region, as well as more than 12 under construction or planned, which are discussed below. Regional cooperation is perceived as an important segment of the Energy Union and a rational response measure against potential supply disruptions by increasing market liquidity and interconnectivity. As a rule, the European Commission provides coordination and partial financial support through its financial instruments, such as the Connecting Europe Facility (CEF), which considers the Projects of Common Interest (PCI) lists (CEEP, 2018).



Source: Compiled by the author based on ENTSO-G Transmission Capacity Map 2019, information from the Gas Transmission System Operators of the SEE countries and reliable media publications.

<u>Romania</u>

The Romanian gas network is connected with the gas networks of four out of its five neighbouring countries (there is no interconnection with Serbia). Historically, Romania used Tekovo (UKR)/ Mediesu Aurit (ROU) (*Interconnection (IC) 2 in Figure 9*) and Isaccea (ROU)/ Orlovka (UKR) (*IC 1 in Figure 9*) interconnection points at the border with Ukraina to receive gas supplies from Russia and transit the negotiated quantities further to a few other countries in the region.

After the implementation of a project for the upgrade of Isaccea, from January 1st 2020, there is also a possibility for gas to flow in a direction from Romania to Ukraine and Moldova (Elliot, S., 2019; Romania Insider, 2021b).

The Arad (HUN)-Szeged (ROU) gas pipeline (*IC 7 in Figure 9*) was officially inaugurated in 2010 and provided a bi-direction gas flow between Hungary and Romania. The interconnection contributes to improving the security of gas supply not only in Romania, but in Central and Eastern Europe.

The interconnector between Romania and Moldova (*IC 10 in Figure 9*) was commissioned in 2020. Its aim is to ensure a higher level of gas supply security in Moldova and the North-East part of Romania. So far, however, it has been used at a very low capacity (HiQSTEP, 2014).

Negru Voda 2,3 (ROU) /Kardam (BGR) interconnection points (*IC 10 in Figure 9*) are part of the Trans Balkan Pipeline supplying Russian gas to Bulgaria through Ukraine and Romania and have been modernised in 2019 in order to provide bidirectional flows. Since April 2021, the Russian gas is delivered to Romania from the TurkStream through the territory of Bulgaria. A second reverse flow interconnection between the countries, Giurgiu (ROU) – Ruse (BGR) interconnection (*IC 9 in Figure 9*), was constructed in 2016. It is expected that when the Interconnection Greece-Bulgaria (*IC 14 in Figure 9*) is completed, natural gas from Azerbaijan and LNG from the Greek ports will also reach Romania (Romania Insider, 2021a).

Bulgaria

The Bulgarian gas network is connected with the gas networks of all its neighbours, including Romania, through the two interconnections described in the previous section.

The existing interconnection point with Greece is Kulata (BGR) /Sidirokastron (GRC) (*IC* 12 in Figure 9), which provides a bi-directional flow of natural gas after the modernisation of the compressor stations in 2016. Prior to that, Russian gas had been transported only from Bulgaria to Greece (Elliot, 2021).

In addition, the Interconnection Greece-Bulgaria (IGB) (*IC 14 in Figure 9*) has been under construction for several years. The project is viewed as important for providing diversification of sources and routes of natural gas supply not only to Bulgaria but for the whole region. Upon completion, SEE countries will be able to receive natural gas by various means and suppliers, including from Azerbaijan (and possibly other neighbouring countries in the future) through the Southern Gas Corridor, from the deposits located in the Eastern Mediterranean by the LNG terminal in Alexandropoulos (Greece) as well as from other global LNG suppliers.

Strandzha (BGR) / Malkoclar (TUR) (*IC 11 in Figure 9*) has been the exit point for Russian gas through the Bulgarian gas network to Turkey for many years. After the construction of the TurkStream, as of January 1st 2020, the entry point for the Russian supplies was changed from Negru Voda (ROU)/ Kardam (BGR) (*IC 10 in Figure 9*) to Strandzha 2 (BGR)/ Malkoclar (TUR) (*IC 11 in Figure 9*) (WEC, 2020).

Kireevo (BGR)/Zajecar (SRB) (*IC 13 in Figure 9*) is the first interconnection point between Bulgaria and Serbia. It operates officially since January 1st 2021, when Serbia commissioned the Balkan stream at its territory. There is a possibility for reverse flow, but so far, the interconnection has been used for transporting gas from TurkStream to Serbia.

There is also a project for the construction of the bi-directional Gas Interconnection Bulgaria-Serbia (IBS) (*IC 15 in Figure 9*), which will connect the gas transmission systems of Bulgaria and Serbia. The aim of the pipeline is to contribute to the diversification of sources and routes in SEE by ensuring a link for Serbia to the Southern Gas Corridor, the deposits in the Eastern Mediterranean through the LNG terminal in Alexandropoulos (Greece), as well as other global LNG suppliers, through the Gas Interconnector Greece-Bulgaria.

Bulgaria is also transiting gas (at present mainly Russian gas) to the Republic of North Macedonia through the Kyustendil (BGR)/ Zidilovo (MKD) interconnection point (*IC 13 in Figure 9*).

Greece

Greece has gas interconnections with Bulgaria (see the section about Bulgaria above) and Turkey.

The Ipsala (TUR) / Kipi (GRC) (*IC 3 in Figure 9*)at the border with Turkey is the entry point for natural gas through the Interconnector Turkey-Greece (ITG), linked with TANAP, part of the Southern Gas Corridor. The interconnection currently provides the delivery of gas from Azerbaijan and will allow possible future supplies from other countries in the Caspian region. Currently, there is no possibility for a reverse flow at this interconnection.

There is also a project for connecting the Greek gas transmission system with the system of the Republic of North Macedonia (*IC 16 in Figure 9*) in order to diversify gas supplies to the latter (see the section about the Republic of North Macedonia below).

The Republic of North Macedonia

In addition to the existing interconnection with Bulgaria via which the country receives its gas supplies from Russia (*IC 13 in Figure 9*), the government of the Republic of North Macedonia signed an intergovernmental agreement with Greece for the construction of a cross-border gas interconnector (Petrushevska, 2021).

The interconnection point is planned to be located at the border Evzoni (GRC)/ Gevgelija (MKD) (*IC 16 in Figure 9*). Further, the interconnection can be linked with the Trans-Adriatic pipeline, part of the Southern Gas corridor. According to some sources, the section of the pipeline on the territory of the Republic of North Macedonia is already completed (Newman, 2021).

Bosnia and Herzegovina

Bosnia and Herzegovina has one existing gas interconnection point (*IC 8 in Figure 9*), which until recently provided the country's gas supplies from Russia through the Beregovo (UKR) – Horgos (SRB) – Zvornik (BIH) import route crossing the territory of Ukraine, Hungary and Serbia. After the commissioning of the TurkStream, as of 2021, gas quantities have been delivered to Serbia through the new pipeline.

There are three planned interconnections with Croatia: two of them are Slobodnica (HRV) -Bosanski Brod (BIH) (*IC 24 in Figure 9*) and the Interconnection Croatia-Bosnia and Herzegovina (west) (*IC 23 in Figure 9*), and the third with the most mature project implementation – the Southern Interconnection (*IC 18 in Figure 9*), which will enable gas to flow from IAP to Bosnia and Herzegovina (Plinacro, 2019).

The bidirectional Interconnection Bosnia and Herzegovina – Croatia South is expected to provide an alternative gas supply route for the country and to expand its capacity. The pipeline will be connected to two other import routes: Dravaszerdahely (HUN) – Imotski (HRV) and Murfeld (AUT) – Rogatec (SVN) – Imotski (HRV) (Western Balkans Investment Framework, 2021). The interconnection is also expected to ensure diversification of sources and routes for Bosnia and Herzegovina. In addition to the access to the Central and West European markets, the interconnection will enable supply from the Southern Gas Corridor if the IAP project is implemented and from LNG sources through the terminal in Krk (Croatia). If the IAP implementation is postponed, there is a plan to extend the pipeline further 54 km on the Croatian territory. Commissioning is planned for 2024 (Energy Community, 2021).

<u>Croatia</u>

The Croatian gas network is connected to the networks of Slovenia and Hungary and has access to the LNG international market through its terminal in Krk. The traditional route for receiving gas deliveries from Russia is through pipelines crossing the territories of Ukraine, Slovakia, Austria and Slovenia, which connect to the gas transmission system of Croatia at the Rogatec interconnector (*IC 4 in Figure 9*) on the border of Slovenia and Croatia. An upgrade of the interconnection was performed in 2019 in order to substantially increase the transmission capacity between the two countries and to provide a reverse flow from Croatia to Slovenia. The upgrade also ensured better connection between one of the largest gas hubs in Europe – Baumgarten and the Croatian LNG terminal (Plinovodi, 2021).

A second route for gas deliveries was established in 2011 through the construction of the Donji-Miholjac (HRV) – Dravaszerdahely (HUN) pipeline (*IC 5 in Figure 9*) between Croatia and Hungary. This route consists of a pipeline which delivers gas from Hungary to Croatia and its main purpose was to connect Croatia with the Central and West European markets (Center for Energy Studies, 2014).

In addition to the planned interconnections with Bosnia and Herzegovina (see section Bosnia and Herzegovina above), Croatia is also participating in projects for the construction of a second interconnection with Slovenia (the Interconnection Croatia-Slovenia (Umag (HRV) – Koper (SVN) (*IC 22 in Figure 9*) and interconnection with Serbia (*IC 25 in Figure 9*). Both

pipelines are considered important for the regional security of supply but are still in an early stage of development (ENTSO-G, 2020).

Croatia is also planning to connect to the TAP pipeline through a possible connection point with the IAP at Ploce (*IC 21 in Figure 9*), which will enable supply from the Caspian region (Incergo, 2021).

<u>Serbia</u>

The Serbian gas network is connected with the networks of Hungary, Bosnia and Herzegovina and Bulgaria. Prior to the commissioning of the TurkStream and its continuation to South-East Europe – the Balkans Stream, Serbia used to receive its gas supplies from Russia through the Ukraine-Hungary route, which enters the Serbian transmission system at Kiskundorozsma (*IC 6 in Figure 9*). However, from January 1st 2021, Serbia has been receiving gas from the Southern direction through the new Kireevo (BGR)/ Zajecar (SRB) interconnection point with Bulgaria (*IC 17 in Figure 9*). One more interconnection point is planned to be established with Bulgaria through the construction of the Gas Interconnection Bulgaria-Serbia (IBS) (*IC 15 in Figure 9*) (see the section about Bulgaria above).

The continuation of the TurkStream from Serbia to Hungary is under construction and, upon completion, will enable Hungary to receive Russian gas from the Southern route (Enerdata, 2021). The interconnection point with Bosnia and Herzegovina is the only entry point for gas supplies to the latter (see the section about Bosnia and Herzegovina above).

Albania, Montenegro and Kosovo

Albania, Montenegro and Kosovo are the three countries in the region which at present do not have gas interconnections with their neighbouring countries. However, two of them – Albania and Montenegro – are planning to connect to the Southern Gas Corridor by constructing interconnection points between their prospective gas networks and the TAP or IAP transportation systems (*IC 17 and 20 in Figure 9*).

The most advanced in this respect is Albania, whose government signed in July 2021 a cooperation agreement with the Trans Adriatic Pipeline (TAP) AG and the local Albgaz Sh.a. for the construction of a gas exit point with a possibility for bi-directional outside the TAP's compressor station near the town of Fier (*IC 17 in Figure 9*) (TAP, 2021). The new gas exit point is considered a pivotal element of Albania's energy and gas infrastructure development and will provide access for Albania and potentially for some of its neighbouring countries to the gas reserves in the Caspian region.

A lot of diverse projects and ideas for new interconnections are present in the region; however, most probably, only some of them will be realised in the near future. Upon completion, these interconnectors are expected to bring greater flexibility and integration of the gas markets in the region.

5.4. Projects for the interconnection of the gas infrastructures of more than two countries in South-East Europe.

Ionian Adriatic Pipeline (IAP) project

Following the recent commissioning of the Trans Adriatic Pipeline (TAP), several countries in SEE actively promote the development of the Ionian Adriatic Pipeline (IAP) – another gas pipeline project that may provide them with a connection to TAP.

The project aims to establish a new supply route for natural gas along the Adriatic coast. The length of the planned bi-directional pipeline is 500 km and it would pass through the territories of Albania, Montenegro, southern Croatia and Bosnia and Herzegovina (Ionian-Adriatic Pipeline, 2021). The planned annual capacity is 5 blm Bcm and the estimated total cost of the project is 620 mln euros (Serbia Energy, 2020).

In August 2016, Croatia, Albania, Montenegro, Bosnia and Herzegovina and the representatives of the State Oil Company of Azerbaijan (SOCAR) signed a Memorandum of Understanding on a project for the constriction of IAP (Serbia Energy, 2020). Later on, in 2019, four energy companies from these SEE countries agreed to establish a joint venture for the construction of IAP, where each company will hold an equal stake (Ralev, 2019). So far, Montenegro and Albania have received joint financial support in the amount of 2.5 mln euros from the Western Balkan Investment Framework (WBIF) in 2017 for the conceptual design of the project IAP (New Europe, 2017).

However, it is still arguable when and even whether there will be sufficient additional quantities of natural gas for Albania, Montenegro, Croatia and Bosnia and Herzegovina, although the Shah Deniz consortium insists on the future increase of TAP's capacity to 20 Bcm. Moreover, the project is still in a very immature stage and there are many variables around it, including the sources of financing of such a significant infrastructure project that includes countries with relatively limited financial abilities. It is debatable whether the EU would commit to funding such a project, considering the new direction towards a fossil-free energy future. The possible time of implementation of the project has not been announced yet, which also leads to doubts about the likelihood of seeing the Ionian Adriatic Pipeline commissioned soon.

There are two more natural gas pipeline projects in South-East Europe which have been supported by the EU – the e and the Bulgarian-Romanian-Hungarian-Austrian (BRUA) Natural Gas Transmission Corridor Projects. The so-called BRUA project is considered to be a part of the Vertical Corridor and an extension of the Southern Gas Corridor through the Greece-Bulgaria Interconnector (IGB) (EIA, 2017). A linking pipeline is also proposed to be constructed in order to connect BRUA with potential offshore sources in the Black Sea. Eastring is planned as a bi-directional gas pipeline interconnector with an annual capacity of 20-40 Bcm, passing the territories of Slovakia, Hungary, Romania and Bulgaria. However, it might be the case that both the Eastring project and BRUA have lost their momentum.

EastMed project

The Eastern Mediterranean (EastMed) project refers to a combined offshore/onshore natural gas pipeline, which aims to connect the East Mediterranean resources to Greece via Cyprus and Crete (IGI Poseidon, 2021). The almost 2 000 km pipeline is currently designed to transport 10-20 Bcm/y from the gas reserves to Greece and consequently to Italy and South-East Europe (through the Poseidon and IGB pipelines) (IGI Poseidon, 2021). The estimated total cost of the project is around 6 billion euros (Reuters, 2020b). It is expected to be the longest underwater pipeline in the world.

Although the EastMed pipeline project used to have the support of the United States, which acknowledged its "*potential to contribute to the energy security and diversification of energy sources and routes in the Eastern Mediterranean*" (Paraskova, 2020), a recent paper to the Greek government expressed a change in the position of the US Administration and their reservations over the project. Notably, the US are shifting their focus to electricity interconnectors in the region. EastMed is facing two main challenges: the Cyprus gas dispute and uncertainty regarding profitability.

6. Conclusion and Policy Implications

The Russian-Ukrainian dispute over the natural gas transit and the subsequent disruption in natural gas supply from Russia to some European countries in 2006 and 2009 has attracted considerable attention to South-East Europe and a label has been put on the region for the weakest and link in the quest for the European Energy security. Fifteen years after the first gas crisis, this paper analyses what has changed in the region for this period in terms of the security of natural gas supply.

Calculation of the SWI and HHI indexes shows that the region considerably improved its energy sources diversity mainly as a result of the substantial decrease in coal and oil consumption, the decreasing trend in natural gas use and the introduction and wider use of renewable energy sources in all countries in the region.

Natural gas markets in the region are still developing, and despite the political commitments, the progress toward the formation of a single market in South-East Europe is still limited. Although there is a negative trend in the natural gas final consumption in almost all SEE countries, most of the governments in the region have been planning nation-wide gasification and increase of the natural gas share in their energy mix.

In terms of imports, natural gas enters South-East Europe either via pipelines or as liquefied natural gas (LNG) via LNG terminals. The total dependence of the region is about 50% and the largest share of gas imports still comes from Russia. However, there are more gas transit projects under development or planned than in any other region in Europe. There are three recent developments, which are expected to have a long-term impact on SEE, in terms of diversification of sources and routes of supply – recently commissioned TurkStream and Southern Gas Corridor, as well as the LNG terminal in Krk.

Although South-East Europe has indeed been characterised by the absence of interconnecting gas infrastructure 15 years ago, a quiet revolution has taken place in since then. There are 14 existing cross-border interconnection points in the region, as well as more than 12 under construction or planned. A lot of diverse projects and ideas for new interconnections are present in the region; however, probably only some of them will be realised in the near future. Upon completion, these interconnectors are expected to bring greater flexibility and integration of the gas markets in the region. Despite the achieved progress, much remains to be done, especially in regard to the interconnection of the inner Wester Balkan countries, some of which still do not have gas markets in place yet, mainly due to the lack of access to gas networks.

The analysis of the prospects of realisation of a few other projects shows that the BRUA and Eastring projects have lost their momentum of development, the IAP project is also not likely to enter the implementation phase anytime soon, mainly due to lack of financing and uncertainty about the sufficiency of additional natural gas quantities from Azerbaijan, and EastMed is facing two major challenges, namely the Cyprus gas tensions and the uncertainty regarding profitability and availability of investors.

There are a few concurrent developments concerning South-East Europe that will affect the security of its natural gas supply:

- It was the individual countries' plans for sustaining or increasing the natural gas usage that brought about the question of how significant the problem of single-source dependence is. Although the Russian natural gas still comprises the greatest share in the region's supply, concerns over possible disruptions have been addressed by continuing development of reverse flow interconnection in the region and commissioning of new infrastructure (e.g. pipelines, LNG terminals and storage facilities) to create alternative options for the routes and sources of supply, though all these infrastructure projects come at a certain price.
- Energy transition in the countries in SEE seems challenging without the use of natural gas in the short and medium-term, considering the prevailing utilisation of coal there. Despite the lower (compared to the EU average) natural gas prices, it is estimated that up to 40% of the regional population may suffer from energy poverty, compared to 10% in the EU. It is questionable whether the energy transition will make the situation better, especially in the absence of natural gas in the energy mix.
- The future of the natural gas sector at the EU level seems quite uncertain and even its role as a transition fuel is still being debated. This brings ambiguity regarding the need for more infrastructure and the economic viability of all investments put into improving the security of gas supply not only in SEE, but in the entire EU.

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Volume 31(6), 2022

DETERMINANTS AFFECTING CONSUMER ACCEPTANCE AND ADOPTION OF INTERNET BANKING IN DEVELOPING COUNTRIES: THE CASE STUDY OF KOSOVO³

This paper aims to examine how the demographic characteristics affect the level and intention to use and the level of usage of online banking services in Kosovo. A selfadministered survey was conducted with 600 questionnaires sent, from which 510 participants responded to it and were considered accurate and appropriate for the study. The data for this research started at the end of 2020 until the middle of 2021 and a probable stratified sample was used, whereas closed-end questions were prepared through a structured questionnaire. The study adopted the technology acceptance model with additional constructs (i.e. consumer innate innovativeness (II), domainspecific innovativeness (DSI), and perceived security risk (PR)). Results showed that even though the participants appreciated the benefits of online banking as the perceived usefulness factor exerts the greatest direct effect, they yet hesitate to fully adopt the online banking system. It is recommended that banks should develop an information campaign to inform their customers about the total effects of the perceived ease of use and the security related to the online banking system. The study is limited to users of a particular region of Kosovo, which should be further widened in future studies by including other countries from the SEE. Furthermore, the study limits itself in determining consumers' intention to acceptance of online services offered by banks in a pandemic situation and, as such, may be affected by the overall chaotic situation created in the given period.

Keywords: Internet banking; Demographic factors; Economic development; Developing countries; Customer behaviour JEL: E20; E42; G14; G21; O33

1. Introduction

Due to global technological development, the financial services sector has undergone rapid development in the past twenty years. Information technology, especially the Internet, has enabled the banking industry to expand within different markets without investing large sums

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³ This paper should be cited as: Ahmeti, F., Prenaj, B. (2022). Determinants Affecting Consumer Acceptance and Adoption of Internet Banking in Developing Countries: The case study of Kosovo. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 60-79.

of money in banking infrastructure. Thinking about the significance of internet banking services in the current state, this paper contributes to the greater understanding of the internet financial adoption decision by extending it to the indicators that directly affect the customers' decisions in that regard. In addition, the technology acceptance model will be incorporated into a new model that includes the primary five influential demographic dimensions, which have been proposed singly or bilaterally in the earlier literature. The key influential dimensions that will be resolved in this research are gender, age, education level, profession, and earnings.

The data for this study is gathered in Kosovo, which is a small country in SEE and the youngest country in Europe, which declared its independence in 2018. Furthermore, the diaspora of Kosovars is one of the largest in Europe and they are very connected to their country. Recently, Kosovo has become a place to go for many international workers that operate in different organizations, real estate investors, and lately tourists, which can cause an amazing increased demand for online banking services. These characteristics have reflected in the banks' working environment, as most customers prefer going to the financial institution branch in their neighbourhood and establishing good relationships with the financial institution personnel rather than using the choice banking channels, which is a rather common habit in small, conservative and developing countries (Ozatac et al., 2016).

This highlights the significance of this paper, which aims to provide important information about the possible customers and helps the banks' supervisors and policymakers in Kosovo in improving their marketing strategy toward benefiting from internet banking advantages. In addition, Kosovo's financial system competitivity numerous improved services and facilitates its incorporation with the global economic climate as all banks are foreign investments or the majority of shares are owned by foreign banks, which makes them easier access to new technologies and systems, and the most important the needed experience.

Furthermore, to the best of our knowledge, this paper treats an important topic, as it has shown to be crucial in situations such as lockdown and social distancing due to the Covid-19 pandemics, which the world has never faced before. Hence, it investigates the determinants affecting customer acceptance and adoption level of internet banking in Kosovo in pandemic and extraordinary situations such as Covid-19, which is now considered the new "reality". Additionally, the proposed model in this paper is a mixed model that distinguishes between reflective and confirmative constructs, because the subjective norms (SN) construct that signifies the social dimensions is measured by formative indicators since it is a result of the social communication process and it is created by the exterior influences (Rogers, 2003).

2. Literature Review

Internet banking has undergone explosive development. Thus, it is considered one of the fastest-growing changes in the banking sector, which has transformed it forever (Aydogan, Van-Hove, 2017). Through the provision of online services, banks enable cost reduction, improvement of banking services, market expansion, etc., while offering to its customers more flexible financial services, such as online fund transfer, bill payment, access to account

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status, balance, and transaction printing, and many other services (Lin et al., 2020). As noted in previous studies, internet banking is recently considered an efficient and profitable strategy for providing banking services that contribute to the increase of the loyalty of customers toward the bank (Carranza et al., 2021; Kitsios et al., 2021). Therefore, today, online banking is considered equally significant and safe as traditional banking. In 2008, Bill Gates declared that banking is essential, not banks, which means that the adoption of online banking services is more related to the overall changes and it is a fact that traditional banking will be substituted by virtual banking (Kitsios et al., 2021).

This expansion was largely possible as the majority of banking services were delivered through internet banking (Mistrena, 2021). According to Consoli (2003), during the early 90s, there were many obstacles and regulations, which have hindered the adoption of new technologies by banks. Therefore, there has been little motivation to change, which has been opposed to change by the majority of banks' customers, who have considered traditional banking more secure. However, with the onset of the deregulation of the banking industry in the early 90s, the situation changed (Nazaritehrani, Mashali, 2020; Ahmad et al., 2020), whereas the majority of banks clienteles have comprehended the importance and benefits of using online technology for their banking transactions. In this regard, it was evident that the situation was putting pressure on incumbents, and the requirement in the sector was for faster change (Sloboda et al., 2018). Urged by this competition, some banks applied a more creative approach and invested in technology, which also led to the development of online services (Bin Haji Saman, 2018; Alhassany, Faisal, 2018). The growing level of usage of online banking has encouraged banks to reformulate their way of doing business, to remain competitive. Since the clients are the promotors and initiators of innovation, they require more flexible and innovative banking services (Oertzen, Odekerken-Schröder, 2019).

Various authors regarding online banking have given many definitions (Alhassany, Faisal, 2018; Lin et al., 2020). These definitions address areas such as services offered, advantages and disadvantages, types of online banking, etc. Hence, it refers to internet banking as offering banking services to its clients. In a broader sense, internet banking means providing financial services via the internet, including traditional services banking, transfer of funds, and opening of new deposit accounts, as well as new services such as electronic payment of monthly bills and automatic payments via the website of the respective bank (Lin et al., 2020).

2.1. Internet banking

Internet banking is defined as the composite of technology that offers clients the possibility to get information about products and services offered by banks (Agyei et al., 2021; Ghasemi et al., 2021). It grants them access to their accounts via the Internet while avoiding traditional forms of obtaining the same service. However, this traditional form requires more time and additional expenses for the customer to access the bank. Nowadays, there are two main forms of delivery of online banking services. The first form is by providing services through the Internet by banks. It is mainly carried out within their branches. In addition, they included internet-banking services on their website; and at the same time, they enable online services and traditional banking at the branch office. The second form is the opening of virtual banks

or online banks, which offer their services entirely online, while the deposit and withdrawal of money are provided through ATMs or bank branches that are partner banks with the virtual bank (Marakarkandy et al., 2017).

Even if internet banking seems to be identical for all service providers, the internet banking services offered vary from bank to bank. However, except for cash withdrawal and cash deposits, internet banking permits customers on every other service with a simple click (Alhassany, Faisal, 2018). According to Karajaluoto (2002), online banking facilitates clienteles to control their account balance, transfer money, pay bills, apply for loans, make payments for the purchase of securities, and many other services (Karajaluoto, 2002).

Both banks and customers, benefit from internet banking and the implementation of this innovation in the banking sector. Internet banking allows banks to expand their market and also access customers who, for different reasons, are unable to have access to traditional banks, thereby resulting to cost reduction, improvement of the overall bank reputation, increasing efficiency, enhancing customer satisfaction, and increasing customer loyalty (Marakarkandy et al., 2017). On the other hand, consumers benefit in different ways, i.e. cost reduction, scale, and spatial comfort, saving time, minimizing the importance of geographical distance, etc. (Karjaluoto, 2002).

2.2. Covid-19 pandemics as a facilitator in internet banking adoption

Using the increasingly widespread recognition of mobile products, the overall perception regarding the acceptance of new technologies has substantially transformed, especially concerning monetary transactions. Mobile transaction (in specific online payment) has already been considerably adopted within various industries lately. According to the WorldPay report, online payments made up 22% of the worldwide points of purchase spending in 2019, and this portion will increase to 30% in 2023 (WGPR, 2022). Furthermore, new world economies such as China, have additionally contributed to the overwhelming increase associated with the online sale, respectively, online payments and reached p to 50% associated with point-of-sale obligations in 2019 (WGPR, 2022). Various earlier studies have caused the understanding associated with adoption intentions associated with online payment in various contexts (Cabanillas et al., 2018; Cao, Niu, 2019). Nevertheless, presently there are still insufficiencies of determinant variance and theoretical proof of different viewpoints in emergency conditions created due to the pandemic issue (Zhao, Bacao, 2021).

As the Covid-19 pandemics were detected in 2019 (Zhou, Kan, 2021), which presented a particular high risk associated with the transmission, decreasing contact and maintaining social isolation was highly suggested by the World Health Organization (WHO) (WHO, 2020; Tang et al. 2020). Within this sense, the particular contactless characteristic associated with mobile and online payments could probably contribute to users' mental and actual expectations to assist their transaction procedures and protect their particular safety. Accordingly, usage of online payments in different countries has drastically increased due to restrictions imposed by countries and the fear of infection (Zhou, Kan, 2021). Additionally, users' payment behaviour and business versions have changed from traditional face-to-face dealings to contactless and online payment transactions during the particular pandemic,

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which in turn profoundly supports the survival of companies that were struggling to continue their economic activities that were based on direct contact with customers. It is extremely valuable to understand customers' behaviour within the new pandemic situation for appropriate researchers and stakeholders to comprehensively check out information on technology usage under a crisis and to be able to further develop new strategies that may be beneficial for all parties.

Traditional usage models evaluate users' purposes determined by technical perceptions with a good clear limitation associated with the influence of users' mental perceptions (Rahman et al., 2021; Kasilingam, Krishna, 2022). Remarkably, based on the particular recommendations and restrictions imposed in different countries by local authorities as well by the WHO (2020) regarding restrictions associated with direct contacts during the Covid-19 pandemic circumstance (WHO, 2020), the particular contactless feature associated with online payment potentially inspired users' attitudes concerning the benefits associated with using online and contactless payment technologies, intended for the daily transaction, which usually indicates that environmental conditions affect users' mental process along concerning the adoption of online payment (Deilami et al. 20218). Thus, this document involved mental construction theory (MAT) to make clear customers' emotional cognitions of the particular benefits associated with using online and cash-less payment in an emergency and rather complicated situation.

Meanwhile, perceived benefits are usually considered a crucial factor regarding users' expectations and can help determine their particular decisions (Park et al., 20219). Furthermore, as a result of the new situation created by Covid-19 pandemics, perceived security and trust in online and cash-less payment technologies are considered since additional antecedents are associated with users' adoption purposes of online payment (Sahi et al., 2021). Perceived safety and perceived ease of use are the many significant determinants associated with trust and benefits related to technology application, which impacts users' intentions associated with using online payment in the future (Sahi et al., 2021).

2.3. Adoption of internet banking in emerging economies

A new paradigm has occurred under online payment and new technologies associated with it. Sahi et al. (2021) define online and cash-less payments as using newly offered possibilities from different communicative devices besides the usual computers (i.e. mobile devices) to conduct a transaction. As further noted by authors, online transaction systems provide versatility, mobility, and effectiveness to overcome everyday difficulties or meet their particular users' wishes (Sahi et al., 2021). Contribution towards the online payment definitions is transferring money to providers of goods and services through the internet and other forms such as messages, which are considered as fast and secured.

As the majority of companies that are facing difficulties in this regard, namely online payment infrastructure, are SMEs in developing countries (Ha, 2020). Hence, in this and similar situations that may occur in the future, online payment may also be essential for surviving SMEs in developing countries. In this regard, the most affected sector in developing countries is the retail industry. Many factors may affect the level of usage of

online and cash-less payments in different sectors. In developing countries, SMEs constitute the majority associated with the enterprises within developing countries, which are also considered the key component of overall economic growth (Manzoor et al., 2021), which is also evident in Kosovo, where SMEs are the biggest contributor to employment in Kosovo, by providing more than 75% of total employment and round 80% of total value-added of the private sector (OECD, 2019).

The online payment strategy is becoming a leading transaction method in developing and emerging economies (Gong et al., 2019). The launch of groundbreaking varieties of information technology (IT) services has simplified the usage and the information campaign has also convinced the present and potential users about the security and safety that online payment provides (Sahi et al., 2021). The ability to enhance and improve the use of IT has become the major criterion to promote and enhance future monetary flexibility in developing nations.

Habib and Hamadneh (2021) highlighted that perceived safety (PC) is significantly related to customers' intent to use online and cash-less payment services and technologies, which in particular affects the consumers' judgment upon mobile payment services' privacy and protection issues. On the other side, some authors also emphasize that usability difficulties (perceived ease-of-use) were considered the main factor associated with the low adoption of various online and cash-less payment systems and tools (Habib, Hamadneh, 2021; Sahi et al., 2021). Karsen et al. (2019) opinioned that will mobile devices ought to be useful for monetary transactions by applying an authentication system to create sure every transaction is safe.

2.4. Theoretical background and hypotheses development

Various studies have already been conducted in sociology, psychology, and information system research to look for the factors that impact an individual's ICT adoption behaviour (Xie et al., 2021). In the last decades, several theoretical strategies have been employed with a specific focus on the research of technology adoption. This regarding the adoption of technologies related to online payments and financial transactions is mostly based on contextual factors like interpersonal influence, risk, and trust (Al Nawayseh, 2020; Xie et al., 2021). However, the majority of past studies that analyzed the acceptance of internet banking systems and technologies have mainly focused on technological aspects and overlooked the social elements (Senyo, Osabutey, 2020).

The Technology Acceptance Model (TAM) was thoroughly applied in the study on the adoption of mobile services, as the use of behavioural theories and the extended valence platform remains limited (Al Nawayseh, 2020; Senyo, Osabutey, 2020). The original Unified Theory of Acceptance and Use of Technology (UTAUT) model posited four major measurements as determinants of use intention and behaviour, such as performance expectations, effort expectancy, interpersonal influence, and assisting conditions (Rahi et al., 2019). The particular extended valence platform, on the other hand, revealed that the intention of consumers to utilize technology is influenced by their perception of advantages, risks, and trust (Mer, Virdi, 2021). Within this regard, the UTAUT model combined with the extended valence construction is deemed to become more suitable for fintech software

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programs as mobile financial adoption to provide more insights into other contextual elements, such as risk and trust at the same time (Al Nawayseh, 2020). Customers' usage level of online technologies regarding payment can be seen as a form of technology used to a certain extent. Consequently, this study seeks to present an online financial service adoption framework by merging financial service consumption attributes, like perceived usefulness and perceived ease-of-use, with additional contextual aspects from the prolonged valence framework, such as trust and risk. The relationships in this study model are highlighted in the following sections, as shown in Figure 1.



Technology Acceptance Model-TAM

Figure 1

Source: adapted from Davis, 1989.

A glance at the websites of these banks shows that eight of them offer online services, whereas only one is yet in the preparation phase. However, according to their announcement, they are preparing to launch online services soon. According to the CBRK (2014), internet banking in Kosovo for the first time was introduced by two of the largest banks in the country, ProCredit Bank and Raiffeisen Bank, in mid-2006. Thus, the adoption of those services by its customers can be considered slow and unsatisfactory (Kaur et al., 2021). The hesitation is assumed to result, as online banking is new for the region. This is due to the lack of experience in certain demographic groups. In addition, the major reason may be the level of customer awareness in this particular region. Technology Acceptance Model (TAM) – developed by Davis (1989), can be considered as the most used model regarding Internet Banking adoption (Adogan, Van Hove, 2017).

2.5. Perceived Usefulness (PU)

The particular perceived usefulness (PU) refers to the belief of buyers about Internet financial transactions that this service should enhance their financial fulfilment and transactions experience (Mer, Virdi, 2021). PU examines the potential level for a technological mechanism or process to be useful and accepted by an individual (Mer, Virdi, 2021). The particular literature has recommended that PU can become a crucial factor in shaping a person's behaviour to adopt technological services. PU is found to be an important variable in generating a person's mindset in the direction of a particular technology to simply accept

(Yousuf, Shanyu, 2021). Prior studies supported the important role of PU in speeding up an individual's determination and propensity to adopt internet finance (Yousuf, Shanyu, 2021).

2.6. Perceived Ease-of-Use (PEU)

Perceived Ease-of-Use (PEU) identifies a person's understanding of technical service that the technical service is user-friendly, straightforward, and effortless and helps to describe a person's feeling towards the easiness of any given technology (AL-Zubi, 2021). Customers understand online banking and other cashless services to be more reliable if the service's technological system is often simpler for the service users. Various research mentioned that a higher level of PEU will lead to more willingness and readiness for the acceptance of online banking and other cashless payment services (AL-Zubi, 2021).

Many have highlighted that demographic factors have a direct impact on the level of adoption of new technology, in this regard online banking (Weligodapola et al., 2020). According to most of these studies, there is a significant link between technology adoption and demographic factors. According to Rogers (2003), typical adopters of new technologies, especially when it implies more sophisticated IT technology, are identified as young individuals who have good communication skills. As internet banking requires specific knowledge of technology from its users, typical adopters are mostly young, well-educated people, and they have a good income. In this regard, the main factors that are considered in this study are as follows: gender, age, educational level, profession, and income level. In this regard, hypotheses are developed and tested through the research model as in Figure 2.

3. Methodology

The research provides a descriptive elaboration and analysis of factors that determine the level of the usage of banking services through the internet in Kosovo. Once the type and purpose of the research are specified, the appropriate method (approach) was selected to be implemented. As the type of research and its methods are determined, the next step is to determine and develop a suitable investigation approach (regarding the data collection). Given this, the data were gathered through a questionnaire used for the survey and which best meets the needs of researchers.

The questionnaire consisted of closed-end questions and was administered by an interviewer. A cross-sectional study design was used to assemble the data required for this study. As a result, the data were collected at a given point in time for the entire sample. Since the focus of the research is to identify and measure the impact of demographic factors that affect the level of usage of banking services through the internet by individual clients, the target population consisted of all citizens living and possessing an account in Kosovo. An analysis was carried out on customers by all banks from the whole territory of the Republic of Kosovo. Thus, the results are more accurate and can be generalizable to the targeted population.





3.1. Sampling Procedure and Sample Size

Good Sampling is considered when the member of the population has the same opportunity to be elected. It should be impartial and sufficient in size so that the results are reliable (Gravetter, Forzano, 2015). For this study, the researchers have implemented the probability samples (randomly selected), which were stratified by seven regions throughout Kosovo (Iliyasu, Etikan, 2021). Stratification was based on the size of the population within each region. To determine the right size of the sample, it is required that the analysis should be dynamic and not only produce mathematical calculations and data. The main factors determining the sample size are the level of confidence and the error margin (confidence interval) (Fisher, 2007; Nanjundeswaraswamy, Divakar, 2021). The researchers in this study targeted a 95% confidence level and a margin of error of 5%.

Mathematical calculations show that for a population of 100.000+, the sample size should be at least 384 individuals. However, to surge the accuracy of the outcomes, the sample size was increased to 510 respondents, as the allowed and predicted margin of error would be lower than 5%. In cases where respondents refused to participate in the research and for all uncompleted questionnaires, the researchers have replaced them with new questionaries' and have sent them to the new respondent. This process was done to preserve a sample of 510 respondents. In total, 600 questionnaires were issued; 510 of them have been completed and are valid; 37 are damaged or not fully completed, thus not valid; and 53 were returned without or not completed information.

4. Results

Intending to meet the objectives and hypothesis testing, two different groups with different habits regarding the usage of internet banking services were part of the survey (users and non-users). In total, 510 valid responses were returned from 600 questionnaires that were issued by researchers in the field.

Table 1 illustrates both the frequency and percentage of target groups (users and non-users). It reveals that the dominant groups are non-users with 82.7%, while users of internet banking services account for only 17.3% of the responses received. As a developing country, similar to other developing countries, Kosovo is facing a transition from a post-conflict situation where technology was considered a luxury; now, the implementation of technologies is mainly accepted by the younger generation.

Table 1

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Variable	Description	All respondents			
variable	Description	f.	%		
Internet heading a vege	Internet banking user	88	17.30%		
internet banking usage	Non- internet banking user	422	82.70%		

Source: compiled and calculated by the authors.

Table 2 shows that 52.2% of respondents were male, whereas the female respondent rate was 47.8%. In addition, table 2 presents gender distribution through the use of internet banking. It can be noticed that males constitute 63.6% of users, while the remaining constitute women (or 36.4%). In addition, the non-user values are almost equal to 50.2% male and 49.8% female.

Table 2

V	Description	All respondents		Internet banking user		Non-internet banking user	
variable	Description	f.	%	f.	%	f.	%
Gender	Female	244	47.80%	32	36.40%	212	50.20%
	Male	266	52.20%	56	63.60%	210	49.80%

Gender and usage of internet banking

Table 3 shows that the age of the respondents is presented in several groups, the 18-30 age group, which is represented by 54.1%, and the 31-40 age group, which represents 24.5%. On the other hand, the group between 31-40 years is the dominant group of users, followed by the younger group between 18-30 years. In the non-user group, the age group with more weight is 18-30 with 57.8% from the total number of respondents, followed by the age group of 31-40 years with 21.3%. Yet, the comparison of data within each group is presented in Figure 3, where the results are focused on presenting the data that concerns each group.

In direct compression of the users and non-users of internet banking services within the same group (Figure 3), it is evident that age is a significant factor regarding the level of internet banking and online payment usage. Even if expected that the level of internet users in group 18-30 would be higher (11.59% users and non-users with 88.41%), it was revealed that the

Source: compiled and calculated by the authors.

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majority of respondents are students and the main reason given for avoiding ng internet banking was the high price that is charged for those services by banks, and also, they are not the family heads and as such, they do not have to carry out payments regarding the household payments.

Table 3

Variable	Description	All respondents		Internet banking user		Non-internet banking user	
variable	Description	f.	%	f.	%	f.	%
	18-30	276	54.10%	32	36.30%	244	57.80%
	31-40	125	24.50%	35	39.70%	90	21.30%
Age	41-50	65	12.70%	14	15.90%	51	12.10%
	51-60	33	6.50%	5	5.60%	28	6.60%
	60+	11	2.20%	2	2.20%	9	2.10%

Age and usage of internet banking

Source: compiled and calculated by the authors.

Figure 3





Source: compiled and calculated by the authors.

Table 4 displays the level of acceptance and usage of internet banking based on the educational level and compares it with the entire number of respondents. Data confirms that respondents with high-school education level are the largest group of respondents with 53.8%. The largest group of internet banking users are respondents who have bachelor's degrees with 51.1%, while the largest part of non-users fits the respondent group that has completed secondary school (high school) (59.7%), and 25.1% of non-users have university degrees. Although it is outnumbered, interesting is the result of respondents with primary education, which was revealed to be 100 % non-users of banking services through the internet. The comparison of data within each group is presented in Figure 4, where the results are focused on presenting the data that concerns each group.

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Table 4

Variable	Decomintion	All respondents		Internet banking user		Non-internet banking user	
variable	Description	f.	%	f.	%	f.	%
	Primary school	15	2.90%	0	0.00%	15	3.60%
Education	High school	274	53.80%	22	25.00%	252	59.70%
	Diploma	35	6.90%	6	6.80%	29	6.90%
	Bachelor	151	29.60%	45	51.10%	106	25.10%
	Master or more	35	6.80%	15	17.00%	20	4.70%

Education and internet banking usage

Source: compiled and calculated by the authors.

When comparing respondents (individuals) within the same group (Figure 4), it is evident that education has a strong correlation with the level of usage of internet banking services; hence, the higher the educational level, the higher the usage level of internet banking and payment systems. The primary school group has confirmed that they do not need any online banking systems (with 100% non-users) as they either earn less or there is there no need for any online transactions for them.

Figure 4

Education and internet banking usage (group comparison)



Source: compiled and calculated by the authors.

Whereas, the group with Masters (or higher) degree group is confident that internet banking and online payments are the best way to deal with any kind of payments representing 42.86% that use and 57.14% that do not use internet banking and online payment systems.

Table 5 also shows the distribution of occupations in two research groups (users and nonusers). It is evident that students are the main group of respondents with 29.2%, whereas selfemployed and professionals participate with 19.4% and 19.8%, respectively. As can be seen in Table 5, the majority of internet banking users are in the self-employed group with 38.6%, meaning that they tend to make any payments from mobile devices and spend less time with physical payments. For them, time is more valuable compared to the cost that banks are charging for internet banking services.

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Table 5

		-		-			
Variable	Description	All respondents		Internet banking user		Non-internet banking user	
variable	Description	f.	%	f.	%	f.	%
	Unemployed	52	10.20%	0	0.00%	52	12.30%
	Retired	8	1.60%	0	0.00%	8	1.90%
	Student	149	29.20%	13	14.80%	136	32.20%
Occupation	Laborer	44	8.60%	0	0.00%	44	10.40%
	Government	57	11.20%	9	10.20%	48	11.40%
	Professional	101	19.80%	32	36.40%	69	16.40%
	Self-employed	99	19.40%	34	38.60%	65	15.40%

Occupation and internet banking usage

Source: compiled and calculated by the authors.

Another element that characterizes the correlation between occupation and internet banking usage is the fact that the unemployed and retired hesitate to make any payments through the internet. Many reasons are usually impacting the level of internet banking usage for these two categories, yet they still differ in several aspects. Unemployed individuals usually avoid having an internet banking system as it is convoyed with additional cost, which is unbearable for them. Furthermore, even if they have any income (i.e. through relatives, any spontaneous jobs), they are not able to deposit the money legally in the banking account, thus, they send it in cash.

On the other side, the similarity between retired persons and unemployed is the additional cost that they avoid and which is charged by banks if internet banking is required. Yet, the difference lies in the ability to use the internet system and the knowledge needed for that, which is new for the majority of retired individuals, especially in developing countries. The comparison of data within each group is presented in Figure 5, where the results are focused on presenting the data that concerns each group.





Source: compiled and calculated by the authors.
- Economic Studies Journal (Ikonomicheski Izsledvania), 31(6), pp. 60-79.

Table 6 shows that respondents with no income are the largest group with 35.4% of respondents, as the majority of them are still students and are not fully engaged in permanent employment. The group with the highest income is the largest group that uses the internet and online banking payment system, with 43.2%. Another important group is the one that consists of respondents that earn between 250-450 Euro (monthly wages), which makes 26.1% which is rather a low-level user of internet banking. The comparison of data within each group is presented in Figure 5, where the results are focused on presenting the data that concerns each group.

Table 6

Variable	Decorintion	All respondents		Interne	et banking user	Non-internet banking user		
variable	Description	f.	%	f.	%	f.	%	
	No income	181	35.40%	11	12.50%	170	40.30%	
	150-250 (euro)	56	11.00%	2	2.30%	54	12.80%	
Monthly income	250-450 (euro)	133	26.10%	14	15.90%	119	28.20%	
	450-600 (euro)	59	11.50%	23	26.10%	36	8.50%	
	600+ (euro)	81	16.00%	38	43.20%	43	10.20%	
	600+ (euro)	81	16.00%	38	43.20%	43	10.20%	

Monthly income and internet banking usage

Source: compiled and calculated by the authors.

Figure 5





Source: compiled and calculated by the authors.

The most evident indicator for using internet banking and online payment tools and systems is the level of income. As shown in Figure 5, the largest percentage of individuals that use internet banking within the same income level is within the 600+ Euro group, representing 46.9% that regularly the internet banking and payment services. Followed by the 450-600 Euro group, which confirmed that 38.98% use internet banking. In compassion, the no-income group (with only 6.08% responding as users and 93.9% as non-users) and 150-250 Euro group (where 3.57% are users and 96.43% responded as non-users) have shown no significant intention to use internet banking is very low.

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To determine whether a connection between demographic factors and the use of banking services based and offered through online platforms (internet) exists, the researchers implemented the Chi-Square test. The details of this test are presented in Table 7.

Table 7

Variable	Value	Df	Asymp.sig. (2-sided)
Gender	5.616	1	0.018
Age	17.247	4	0.002
Education	52.179	4	0
Occupation	64.341	6	0

Chi-Square Tests

Source: compiled and calculated by the authors.

5. Discussion and Limitations

5.1. Discussion and hypothesis analysis

To create more reliable data, the researchers employed three statistical tests to test the five hypotheses raised. The data from these tests are presented in table 8, presenting the status of hypotheses scattered throughout three statistical tests used for testing hypotheses. Although confirmed, it was not proven that the second hypothesis was related to gender.

In the first row of Table 7, we can see the Chi-Square testing (X2 = 5616, df = 1, and Sig. 0.018) confirming the correlation between Gender and the level of use of online banking services. Outcomes make available proof of strong evidence of the relationship between age and usage of online banking (X2 = 17,247, df = 4 and Sig. 0.002). The correlation between education and the level of online banking adaptation is strong (X2 = 52,179, df = 4, and Sig. 0). Data for Occupation of the individuals part of this research (X2 = 64,341, df = 6, and Sig. 0) confirms that there is strong evidence that there is a link between age and the use of the internet banking. The last data presented in Table 7 presents the linkage between the level of income and the level of usage of online banking services (X2 = 96,813, df = 4, and Sig. 0).

The research has confirmed that there is a correlation between gender and the level of usage of online banking services in Kosovo, which is rather a weak level of correlation. Hence, H1 is supported. These findings are consistent with the findings of other previous research conducted by other researchers. Hence, the previous studies have proven that males are keener to use internet banking compared to females and confirmed that gender is a significant factor that impacts internet banking adoption.

H2 tests the correlation between age and the usage of online banking services level. Table 7 shows that this was confirmed in Chi-Square Test. According to collected data, there is a trend that proves that as the age increases up to a certain level, at the same time, the possibility of using internet banking slightly increases. The main reason for this phenomenon is that the rate of unemployment among young people is high. The previous research considered in this paper, suggests that age is a very important factor.

H3 states that "There is a positive relationship between the education level and the adoption of online banking services". Table 7 shows that this was a confirmed Chi-Square Test. This

means that Kosovo's level of education is related to the banking services that are offered and available online.

The H4 is also confirmed to have a strong correlation and that the profession of individuals is associated with the usage level of online banking services and platforms available in Kosovo, which was confirmed by the Chi-Square Test in Table 7. These findings are consistent with previous findings (Karjaluoto, 2002; Wan et al., 2005), which declared that the adoption of internet banking tends to be higher among individuals that have senior and middle-level occupations. However, it is lower for those individuals who belong to professions with a lower level of occupation. Furthermore, they claim that professionals, students, and the self-employed were the largest groups in adopting the use of internet banking services.

The collected data indicates that income level is positively correlated with the tendency to use online banking in Kosovo (H5 was confirmed by Chi-Square Test). These results are consistent with findings made in earlier research made by different authors (Wan et al., 2005), which is confirmed also in this paper.

5.2. Limitations and future research

Although the contribution of this research study can be considered and delivers insights to interested stakeholders, some limits should be considered in further research. The data form for this particular study is developed based on a cross-sectional research design; a longitudinal investigation is essential to illuminate the effects that may be as only a temporal change due to the situation with pandemics and the lack of information regarding the duration of the pandemic situation. In this regard, to have more reliable conclusions, wider research would be helpful to clarify if the change is only in specific regions or countries, or if it seems to be a future trend that will also be normal behaviour for the future, if example by carrying additional research or comparing research results from studies carried in and across various countries with differing economic development and different culture background.

In this regard, the research results may be valid for the given region (in this case, for countries in the SEE region, in specific in the Balkans), and the sample size cannot be considered valid for a generalization of customer behaviour toward the adoption of online banking services. In this regard, for future research projects on this topic, a more significant number of respondents ought to be included and the study should cover a wider geographical area by including other countries and regions. Another issue that is seen as a limitation is the fact that the analysis has mainly focused on the functional characteristics of technology adoption, which may develop reports on the perceived ease and usefulness but may have avoided other important elements which may be related to emotional and other cultural background factors (Zhang et al. 2018). As noted by Singh and Srivastava (2020), information is considered one of the most important determinants that affected the level of online service usage. Hence, a lack of appropriate information, lowers the trust of customers in online services, especially when it deals with access to their finance (Singh, Srivastava, 2020). Another element that should be considered to create more reliable data is the integration of peripheral variables

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related to value co-creation, such as the confidence in the bank system and the legislative infrastructure within the region where banks offer their services (Mostafa, 2020).

Mostly, people are acting and reacting to a newly created situation and the real level of adoption can be measured only after the pandemics are over, if it is over at all. There are several regions that researchers were not able to get information, if example from people that live in parts that are hard to reach. An additional lack of confidence in giving objective information is evident due to the cultural background of the local population. Some of the information that may be crucial for any conclusion is related to the legislative side of the process (government regulation) and the readiness of Banks (private institutions) and other financial service providers to make investments in a developing region, that is yet facing difficulties to cope with other economies.

6. Conclusions

Internet banking enables the improvement of the banking industry through new services, in specific in developing countries. In addition, at this stage of economic difficulties that developing countries are facing, technological improvement and within this, the application of online services is considered the major facilitator of the overall development of the banking industry, upon which the entire future banking services are to be created and directed. Even if it provides benefits to banks and their clients, using internet banking services in Kosovo remains unsatisfactory. Kosovo is believed to be the country with the smallest level of usage of online banking products and amenities in the region. However, it is well below even when compared with other developing countries outside the Balkan Peninsula. However, more and more people are beginning to understand its advantages and have begun to adopt and accept online banking services and products.

The study can also be used in the region where other countries have the same characteristics and market regulations. In achieving this, the study discussed the effect of these factors: age, gender, education level, occupation, and income level; and consequently, it elaborated on each of them. These factors were tested empirically, which resulted in relatively high importance and a high impact on the level of usage of internet banking by customers in Kosovo.

Most of the conclusions of this research are consistent with similar studies regarding online banking (Alhassany, Faisal, 2018; Nazaritehrani, Mashali, 2020; Agyei et al., 2021). In this study, age was not found to have a linear correlation with the level of usage of online banking services; rather, this relationship is nonlinear and will be explained in other studies with alternative statistical methods. In addition, according to the results, gender does not appear to be a factor that strongly affects the level of practice of internet banking. Grounded on empirical assumptions, all demographic factors analyzed in this paper, except age, have a clear statistical significance in the use of internet banking. Through this study, banks may clarify their ideas regarding internet banking; and thus, better apprehend the needs and concerns of clients.

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Volume 31(6), 2022

DEVELOPMENT OF THE MACEDONIAN BUSINESS SECTOR AND ITS INNOVATION ACTIVITIES FROM THE EARLY TRANSITION YEARS UNTIL TODAY (1991-2021)³

The paper provides a qualitative assessment of the development of the Macedonian business sector and its innovation activities from the early transition years until today (1991-2021). In this article, firstly is reviewed the development of the Macedonian business sector in the analysed period. In this section, special emphasis is placed on the number of active business entities, their sectoral distribution, the institutional infrastructure in the country to support the private sector, etc. Then, an analysis of the innovativeness of the Macedonian business sector in the early transition period and in the period after 2010 was made. In the paper, data related to the labour productivity of the enterprises are also analysed. The analysed data on the innovativeness and productivity of the Macedonian enterprises is compared with the European average. This analysis points to a significant lag in the Macedonian business sector in terms of innovativeness and productivity compared to the EU average. At the end of the paper, conclusions that summarise the weaknesses and achievements of the Macedonian business sector in the past 30 years are given and there are noted areas in which special action should be taken in order for the current situation to be improved. Keywords: transition; privatisation; business sector; innovation; productivity. JEL: O3

1. Development of the Macedonian Business Sector

1.1. Macedonian business sector in the early transition years

After the secession from the Yugoslav federation and the declaration of independence in September 1991, major transformations took place in the economic and political system of the Republic of North Macedonia.

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³ This paper should be cited as: Antovska-Mitev, M., Drangovska, T. (2022). Development of the Macedonian Business Sector and Its Innovation Activities from the Early Transition Years until Today (1991-2021). – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 80-97.

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Macedonia, within the federation, "was the second poorest part of Yugoslavia" (World Bank, 2018, p. 8), whose income per capita in the mid-1980s was about 65% of the Yugoslav federation's average, creating 5.6% of the total production of the federation and participating in the total population of the federation with only 7%. Shortly after independence, the country faced major problems and challenges: high inflation (hyperinflation), whose average annual rate in 1992 reached a staggering 1664%; high unemployment rate, which in the early transition years approached 30%, and peaked in 2005, when it reached 37.3%; high domestic and external debt, which in the early transition period exceeded \$ 1 billion, i.e. \$ 1.5 billion, respectively; high budget deficit, which in 1993 reached -13.4%, etc.

The challenges of the country that emerged after independence can generally be synthesised into several categories: facing a long and difficult process of transition to a market economy; the need for economic recovery from the long recession; loss of the single Yugoslav market, which has shrunk from about 20 million to 2 million after independence; and high domestic debt arising from the so-called frozen foreign currency savings of about \$1.2 billion.

The process of transition that began in the early 1990s took place in the following order: macroeconomic stabilisation, microeconomic liberalisation, privatisation, etc.

The long transition process, marked by the privatisation process in which many large industrial facilities were closed mainly due to their unsustainability and the rapid rise of the unemployment rate, has initiated the process of *spontaneous entrepreneurship* in which numerous small and medium-sized private enterprises were formed. Such trends contributed to the number of business entities in the Macedonian economy at the end of the 1990s to reach 110.000 enterprises, i.e. 172.000 enterprises in 2004, within the most (about 97%) fall into the category of SMEs (Fiti et al., 2007). However, the official data of the Agency for Promotion of the Entrepreneurship (APPRM, 2005) shows that out of the total of 172.000 enterprises registered in 2004, only about 30% or 49.678 enterprises were active, while the remaining enterprises were registered in court, had ID number, tax number and a bank account, but de facto they were not active.

According to the data of SSO (1996), most of the enterprises in the early transition years were located in the field of trade (61.2%), followed by industry and mining (9.8%), financial and other services (6%), etc. The establishment of enterprises in this period took place predominantly with domestic capital, with a share of 96% and the share of the mixed foreign capital was 1.4% and 2.6%, respectively.

Among the key explanations why the most of the private enterprises in this period were formed in the trade stand out (Nenevski, B., Stojanova, V. and Josifovska, A. 1997):

• Purchasing equipment and products for performing production activities were very difficult due to the weakness of local banks, the uncertainty of the denar and the distrust of foreign banks; as well as the unfavourable conditions given by domestic banks for purchasing equipment – high-interest rates of over 10% per month, repayment period of three months and requesting a high share of the pledge (fixed assets in the form of buildings, etc.). All this has made the modernisation of technology in the existing enterprises almost impossible and has hampered the entry of new enterprises into the manufacturing sector.

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- Non-compliance of the level of tax rates with the level of development of the Macedonian economy, e.g. the tax rate on imported used equipment in this period was 42%.
- Lack of appropriate state incentives to stimulate domestic production, etc.

As already stated, an immanent feature of the Macedonian business sector in the early transition years is the spontaneous process of creating SMEs (spontaneous entrepreneurship). In this process, entrepreneurs were left to choose the area they would invest in, the way to provide funds to start a business, etc.

Hence, in the absence of an appropriate macroeconomic policy to support SMEs' development, and especially their engagement in the manufacturing sector, in the absence of a central institution to coordinate the activities of SMEs on a national level, in extremely unfavourable conditions for providing financial support to SMEs, in the absence of local and regional agencies to support the process of creation and promotion of SMEs at a local and regional level and to provide training for entrepreneurs, etc., it can be concluded that the intensive dynamics of SMEs creation, even within an economic system that in this period is not fully developed in terms of the existence of essential institutions for the functioning of the market economy, is strong evidence of the existence of entrepreneurial ideas and entrepreneurial spirit in the Macedonian economy since early transition period.

1.2. Macedonian business sector today

Within the business sector of the Republic of North Macedonia, today, there are more than 70.000 active business entities, which according to their size, are divided into micro-enterprises, small, medium-sized and large enterprises.⁴

The Macedonian business sector in 2020 consists of a total of 73.061 active business entities (Table 1).

Table 1

Year	Total	01)	1-9	10-19	20-49	50-249	250 +
1990	7 234	/	/	/	/	/	/
1999	109 378	/	/	/	/	/	/
2010	75 497	10 756	59 276	2 483	1 568	1 211	203
2015	70 139	7 329	56 261	3 032	1 947	1 339	231
2018	72 315	8 221	57 184	3 142	2 129	1 399	240
2019	75 914	7 565	61 265	3 211	2 237	1 404	232
2020	73 061	6 0 3 6	59 977	3 207	2 198	1 410	233

Number of active business entities, according to the number of persons employed

Source: SSO, 2020, 2021.

¹⁾ Including business entities with an unascertained number of persons employed.

This data shows an increase in the number of active business entities in 2020 by 4% compared to their number in 2015, a decrease by 3.2% compared to 2010 and a tenfold increase in the

⁴ Law on trade companies ("Official Gazette of the Republic of Macedonia", No. 28, 30.4.2004).

number of the active business entities in the country, compared to a total of 7.234 enterprises registered at the end of 1990.

Today in North Macedonia, micro-enterprises, small and medium-sized enterprises create almost 99.7% of the total business population in the country. Among them, the largest group consists of micro-enterprises (up to 10 employees) which in the total active business entities participate with about 90%, while the smallest share in the Macedonian business community, of only 0.3 %, have large enterprises with over 250 employees (SSO, 2021).

Micro-enterprises, small and medium-sized enterprises in the country, create 75.4% of total employment in the private sector (within this, 32.6% belong to micro-enterprises) and 65.8% of the value added in the economy, in which micro-enterprises account for 22% (European Commission, 2018).

In terms of the sectoral distribution, the largest share in the structure is given to the sectors of Wholesale and retail trade; repair of motor vehicles and motorcycles and manufacturing. These two sectors, in 2020, account for 30.4 % and 11.0 % of the overall economic structure, respectively (SSO, 2021). Such data shows positive trends compared to the situation in the early transition years, especially in terms of reducing the number of SMEs in trade, while increasing their share in the manufacturing, construction and modern services sectors. A concrete example of this is the share of only 30.4% of active enterprises "located" in trade in 2020, compared to 67% in 1993.

In North Macedonia, in the early transition years, the process of establishing institutions to support SMEs, entrepreneurship and technology transfer has been started. Among these institutions as institutions with the highest importance in this context should be noted: the National Agency for Development of Small and Medium-sized enterprises (NEPA), established in December 1997, which in 2002 grew into the Agency for Promotion of Entrepreneurship of the Republic of Macedonia (APPRM), today APPRSM; Macedonian Development Bank, established in 1998, today Development Bank of the Republic of North Macedonia; Fund for Innovation and Technology Development, established in December 2013, etc. During this period, also were established numerous research and development departments within the enterprises, regional business centres, regional agencies for entrepreneurship support, technological-industrial development zones, business start-up centres, business incubators, centres for technology transfer and innovations etc.

Hence, compared to the early transition years, today, there is a solid institutional infrastructure in the country to support the business sector.

In North Macedonia in the past period, and especially after 2008, the process of intensive reforms has begun. This process was mainly aimed at improving the business climate and creating conditions for building the innovation capacity of the enterprises, strengthening the role of SMEs in the economy, attracting FDI, fostering R&D and strengthening the competitiveness of the private sector on a national, regional and local level.

During this period, numerous strategic documents were adopted, among which the following are particularly important: National Innovation Strategy 2012-2020, Industrial Policy 2009-2020, National Strategy for Intellectual Property 2009-2012, Strategy for Regional Development 2009-2019, National Small and Medium-sized Enterprises Strategy 2002-

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2013, revised in 2007, Entrepreneural Learning Strategy 2014-2020, Regional Innovation Strategies for eight Planning Regions for the period 2016-2018, Competitiveness Strategy 2016-2020, Industrial Strategy 2018-2027, National Small and Medium-sized Enterprises Strategy 2018-2023, etc. In 2018, the Plan for Economic Growth was adopted, as one very serious attempt of the State (Government) to establish a more comprehensive system to support the innovativeness and competitiveness of the Macedonian business sector. In 2018, the Republic of North Macedonia has also launched the process for Smart Specialisation Strategy (S3) development, as a comprehensive model for sustainable economic growth based on the capacities of the endogenous industry, science, and society. S3 should be linked and add value to the Industrial Policy, Competitiveness Strategy, Innovation Strategy, R&D Strategy, etc⁵. The objective of S3 is to identify the areas of specialisation where the Republic of North Macedonia could build comparative advantages, in order to maximise the effects of public investments. The S3 development process is scheduled to be completed in 2022.

However, despite the started process of intensive reforms aimed to support the SMEs sector and to strengthen their role in the economy, some of the immanent challenges for the early transition period remain relevant until today. These challenges are related to: low level of expenditures on R&D relative to GDP (R&D intensity), which for a long period amounted to 0.22% of GDP, and in the recent period are fluctuating within the range of 0.3% to 0.4% of GDP; low level of R&D expenditures by the business sector ranging from around 0.02% to 0.1% of GDP, especially compared to the EU business sector, whose average R&D expenditures amounted 1.3% of GDP (Eurostat, 2020); a small number of R&D departments (research cores) within the enterprises, as well as a small number of people employed in these sectors; low share of high-tech industrial products in the total export of industrial products in the country; difficult access of SMEs to financial resources, etc. All this determines modest innovativeness, limited competitiveness and low productivity of the Macedonian business sector.

2. Analysis of the Innovation Performance of the Macedonian Business Sector

2.1. Innovation activity of the Macedonian business sector in the early transition years

Given that in the early transition years, most of the active enterprises were with low financial status, primarily founded out of necessity, they could hardly be labelled as entrepreneurial firms – they had low innovation capacity, low export performance and low ability to grow fast. Due to the fact that the statistical data for innovative businesses for this period is very poor and almost non-existent, the only alternative sources for assessing the situation are some regional surveys conducted by the European Commission (European Commission, 1998), which show that in the 1990s only about 5% of the total SMEs in the region have the potential for rapid growth, which means that "they were able to introduce innovation in their operations and to improve their own competitive position in the domestic market and the international markets" (Fiti and et al., 2007, pp. 229).

⁵ http://konkurentnost.mk.

The official statistics on the innovative business entities in the Republic of North Macedonia in the later period also remain poor, due to the analyses of researchers in this area are mainly based on their own research, i.e. surveys.

The situation in the field of statistics of entrepreneurial firms had significantly improved after 2010, when the State Statistical Office (SSO) started publishing data on innovative firms in North Macedonia, mainly at a national level, based on a special survey conducted according to Eurostat methodology.

2.2. Innovation activity of the Macedonian business sector according to the State Statistical Office surveys

Starting from 2010 until today, the State Statistical Office has conducted four surveys and has published four reports with summary data on the innovative business entities on a national level:

- Survey 2010-2012, published in 2014;
- Survey 2012-2014, published in 2016;
- Survey 2014-2016, published in 2018;
- Survey 2016-2018, published in 2020.

The SSO surveys are based on a representative sample of over 2.000 business entities weighted on the total number of business entities in North Macedonia. Micro-enterprises are not included in the SSO surveys, which is in line with the Eurostat methodology, although they participate with more than 90% of the total population of active business entities in the country, because they are considered to be enterprises with a low impact on innovation and growth dynamics.

According to the definition of the State Statistical Office, innovative business entities are defined as "entities that have introduced a product, process, organisational or marketing innovation in the reference period" (SSO, 2014, p. 1). In the latest SSO survey, for the reference period 2016-2018, in accordance with the new methodology of Eurostat, innovative enterprises are defined as: "... enterprises that in the reference period have introduced product innovation and/or business process innovation and/or have abandoned/suspended or ongoing innovation activity" (OECD and Eurostat, 2018, p. 20).

According to the data presented in Table 2, the share of innovative business entities in the total number of business entities in the periods 2010-2012, 2012-2014 and 2014-2016 was 42.8%, 36% and 37.4%, respectively. In the last reference period, 2016-2018, more than half, or 55% of the active business entities in the country were innovative.

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Table 2

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Business entities by size	Total	Innovative (number)	%	Non-innovatve (number)	%
		2010-2012			
Total	4.818	2.060	42.8	2.757	57.2
Small	3.967	1.583	39.9	2.384	60.1
Medium-sized	719	377	52.4	342	47.6
Large	132	100	75.8	32	24.2
		2012-2014			
Total	2.997	1.078	36	1.919	64
Small	2.333	774	33.2	1.559	66.8
Medium-sized	549	230	41.9	319	58.1
Large	115	75	65.2	40	34.8
		2014-2016			
Total	3.114	1.166	37.4	1.949	62.6
Small	2.448	871	35.6	1.577	64.4
Medium-sized	552	232	42	321	58.2
Large	114	63	55.3	51	44.7
		2016-2018			
Total	3 198	1 758	55	1 440	45
Small	2 516	1 345	53.5	1 171	46.5
Medium-sized	567	336	59.3	231	40.7
Large	115	77	67	38	33

Business entities by innovation and size classes, for selected periods

Source: SSO, 2014, 2016, 2018 and 2020.

However, such tendencies should be analysed with caution, for the following reasons:

First, the research for the period 2010-2012, which was conducted for the first time in the country with a relatively low response rate (around 50%), to a large extent, could be a reason for distorting the results obtained, i.e. the reason for getting the wrong picture when the data is extrapolated to the level of the total population of enterprises.

Second, within the first research, in addition to the regular sectors prescribed by the Regulation of the European Commission $(995/2012 \text{ EC})^6$, additional sectors on a voluntary basis were included.

Third, business entities from these additional sectors – Agriculture, forestry and fishing, Construction, Wholesale and retail trade; repair of motor vehicles and motorcycles, Accommodation and food service activities, Real estate activities and Administrative and support service activities are excluded from the surveys conducted in the periods 2012-2014, 2014-2016 and 2016-2018.

Fourth, from a methodological point of view, in the second, third and fourth survey, changes were made in relation to the sector Professional, scientific and technical activities. The first survey includes the entire sector with all its division, while the next three surveys include

⁶ European Commission (2012), Commission Implementing Regulation (EU) No. 995/2012 https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:299:0018:0030:EN:PDF.

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only three of its division – Architectural and engineering activities; technical testing and analysis, Scientific research and development and Advertising and market research.

Fifth, in the last, fourth survey, methodological changes were made, related to the type of innovation, i.e. this survey recognises two main types of innovation – product innovation and process innovation. According to the latest research, innovative business entities include enterprises that in the reference period have introduced only product innovation, only process innovation, product innovation and process innovation, as well as enterprises that do not have innovation but have abandoned/suspended or ongoing innovation activities.

For the reasons mentioned above, the reduced share of innovative enterprises in the total enterprises in the second and third reference periods (2012-2014 and 2014-2016) compared to the first period (2010-2012) could be largely attributed to such or similar methodological changes. Also, the highest registered share of innovative enterprises in the total enterprises (55%) in the fourth reference period (2016-2018) could be related to the methodological changes. Such changes include a new category of innovative enterprises that in the reference period do not have innovation, but have abandoned/suspended or ongoing innovation activities. These enterprises in the total innovative enterprises in 2018 participated with 1.6%.

The intensity, presence and type of innovation are significantly determined by the sectors in which enterprises operate.

From the aspect of the sectoral distribution, in all four periods, the highest innovativeness is shown by the enterprises from the sectors Financial and insurance activities and Information and communications.

The lowest innovativeness, on the other hand, is evident in the enterprises from the Transport and storage sector.

A very low level of innovativeness, according to SSO data, is also observed in enterprises from the manufacturing sector, although a significant feature of this sector is the dominant representation of the open innovation model in the innovation process (Drangovska and Antovska-Mitev, 2020). The share of innovative enterprises in the total enterprises in this sector is 45% in the period 2010-2012, 34.7% in the period 2012-2014 and 36.2% in the period 2014-2016. In the last analysed period (2016-2018), in the manufacturing sector has been recorded some improvements in terms of its innovativeness, i.e. in this period, more than half or 52.9% of enterprises operating in the manufacturing were innovative (SSO 2014, 2016, 2018, 2020).

In terms of the type of innovation, product innovation and process innovation (technological innovation), organisational innovation and marketing innovation (non-technological innovation), the situation in the analysed periods shows variable tendencies (Table 3).

According to the new methodology of the SSO (2020), which is harmonised with the changes in the Oslo Manual from 2018, the analysis of innovative business entities by type of innovation for the period 2016-2018, includes: enterprises that have only product innovation, enterprises that have only business process innovation, enterprises that have product and business process innovation and enterprises without innovation, but with abandoned/ suspended or ongoing innovation activities (Table 4). Antovska-Mitev, M., Drangovska, T. (2022). Development of the Macedonian Business Sector and Its Innovation Activities from the Early Transition Years until Today (1991-2021).

Table 3

	Business entities by types of innovation, in selected periods							
Period	Product and	process	Organisation	nal and	Product and process and organisational			
	innovat	ive	marketing inn	novative	and marketing innovative			
	Number	%	Number	%	Number	%		
2010-2012	509	24.7	956	46.4	374	18.2		
2012-2014	400	37.1	386	35.8	206	19.1		
2014-2016	396	34	410	35.2	193	16.6		

Business entities by types of innovation, in selected periods

Source: SSO, 2014, 2016 and 2018.

Table 4

Business entities by types of innovation, 2016-2018

Period	Enterprise	es that	Enterprises that		Enterprises that		Enterprises without		
	have only p	have only product		have only		ict and	innovation, but with		
	innovat	ion	business process		business process		abandoned/suspended or		
			innovati	innovation		ion	ongoing innovation activities		
	Number	%	Number	%	Number	%	Number	%	
2016-2018	295	16.8	457	26	5 978 55.6 29		1.6		

Source: SSO, 2020.

According to the size of enterprises, in the last analysed period (2016-2018), as well as in the previous three reference periods, the highest innovativeness is observed in large enterprises (67%), followed by medium-sized enterprises (59.3%) and, on the end, are the small enterprises (53.5%) (Figure 1).

Figure 1



Another indicator that is very important for the analysis of the innovation capacity of Macedonian businesses is the expenditures for innovation activities (Figure 2).

The data summarised in Figure 2 shows that within expenditures for innovation activities, the expenditures for the acquisition of machinery, equipment, software and buildings have a dominant share.

Figure 2



Source: SSO, 2014, 2016 and 2018.

According to the data from the latest SSO survey for the period 2016-2018, in the structure of investments by activities in the enterprises, again, a dominant share of 76.8% was recorded by the activities related to the acquisition of equipment, machinery, buildings or other tangible assets, followed by investments in marketing, brand building and advertising (10%), training own staff (9.7%) and investments in software development, database work and data analysis (3.5%) (Figure 3).





Source: SSO, 2020.

3. Comparative Analysis of the Innovativeness and Productivity of the Macedonian Businesses and the EU Average

The data presented in Table 5, for the periods 2012-2014 and 2014-2016, shows that North Macedonia, with the innovativeness of business entities of 36% and 37.4%, is lagging behind the EU average by about 13 and 14 percentage points, respectively.

In the last analysed period (2016-2018), North Macedonia, in terms of innovativeness of business entities compared to the EU average, has been recorded an advantage of 4.7 percentage points.

Table 5

				e		
Share of innovative bus	siness	Share of innovative bus	siness	Share of innovative business		
entities, 2012-2014, in	n %	entities, 2014-2016, ii	n %	entities, 2016-2018, in %		
EU-28	49.1	EU-28	51	EU-28	50.3	
Germany	67.0	Belgium	68.0	Estonia	73.1	
Luxembourg	65.1	Portugal	67.0	Cyprus	68.2	
Belgium	64.2	Finland	65.0	Belgium	67.8	
Ireland	61.0	Luxembourg	64.0	Germany	67.8	
Great Britain	60.2	Germany	64.0	Italy	63.2	
Austria	59.5	Austria	62.0	Sweden	63.1	
North Macedonia	36.0	North Macedonia	37.4	Austria	62.6	
Estonia	26.5	Slovakia	31.0	Finland	61.9	
Bulgaria	26.1	Latvia	30.0	North Macedonia	55.0	
Hungary	25.6	Hungary	29.0	Bulgaria	30.1	
Latvia	25.5	Bulgaria	27.0	Hungary	28.7	
Poland	21.0	Poland	22.0	Poland	23.7	
Romania	12.8	Romania	10.0	Romania	14.6	

Share of innovative business entities in selected countries and the EU average

Source: Eurostat, 2019, 2021.

The obtained results within the State Statistical Office's surveys, especially those from the last survey, which show relatively higher innovativeness of the Macedonian business sector compared to the EU-28 average, indicate certain illogicalities, especially in terms of absence of correlation between the obtained results and the factors with high impact on the innovativeness of the business entities. These are the following factors:

The R&D intensity indicator, i.e. the share of gross domestic expenditures on R&D (GERD) relative to GDP. This indicator is important because the country's investments in R&D cause positive externalities – benefits of this type of investment have all scientific institutions, corporate research centres, etc. (Fiti et al., 2020). One of the above mentioned illogicalities is connected to the fact that North Macedonia with the R&D intensity indicator, which for a long time in the transition period was at the level of about 0.22% of GDP, and in the recent period is fluctuating within the range of 0.3% to 0.4% of GDP, shows higher innovativeness (55% for the period 2016-2018) compared to the EU-28 average (50.3% for the period 2016-2018), whose average ratio of GERD to GDP, after 2012, is higher than 2% (Table 5 and Table 6).

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Table 6

Gross domestic expen	ditures on R&D, re	elative to GDP, ir	n selected years
1	· · · · · · · · · · · · · · · · · · ·		2

	2007	2010	2011	2012	2013	2014	2015	2016	2017	2018	2020
EU-28	1.77	1.92	1.97	2	2.02	2.03	2.04	2.04	2.06	2.12	2.32
North Macedonia	0.17	0.22	0.22	0.33	0.44	0.52	0.44	0.44	0.35	0.37	:

Source: Eurostat, 2019, 2020.

The discrepancy is even more pronounced if it is taken into account the indicator of the *participation of different sectors in the gross R&D expenditures, and especially the participation of the business sector.* It is logical to be assumed that the link between this factor and the number of innovative enterprises is much stronger and more direct. In the case of the EU average, there is a high correlation between the distribution of innovative businesses and the percentage share of the business sector in total R&D expenditures. This indicator, in the case of EU-28, is 66.71%, as opposed to the significantly lower share of the Macedonian business sector, of about 30.57%, in the total R&D expenditures (Table 7).

Table 7

Gross domestic expenditures on R&D by sectors of performance, 2018 (Relative to GDP and by sectors of performance, in %)

	Business en	terprise sector	Governm	ent sector	ector Higher education sector private non- profit sector			e non- sector	Total relative
	% of GDP	Share (in %)	% of GDP	Share (in %)	% of GDP	Share (in %)	% of GDP	Share (in %)	in %
EU-28	1.41	66.71	0.23	10.74	0.46	21.78	0.02	0.76	2.12
North Macedonia	0.11	30.57	0.04	9.82	0.21	58.01	0.01	1.61	0.37
		C		2020					

Source: Eurostat, 2020.

A similar discrepancy, when it comes to the Macedonian business sector, is pointed out by other factors with a strong impact on the innovative activity:

Market size – the Macedonian business sector has a market of about 2.000.000 inhabitants with purchasing power, i.e. income per capita that barely exceeds 1/3 of the European average.

Competitive pressure – the Macedonian market shows characteristics of low competitive pressure, i.e. existence of companies operating in a pronounced oligopolistic market structure, determined by the relatively small economy, insufficient efficiency of institutions for competition protection, etc.

Difficult access of Macedonian enterprises to funds for financing growth and innovation activity – this factor has a significant limiting effect on the innovativeness of our enterprises, especially given that there is a high degree of absence of alternative sources of business financing in the country – venture capital (business angels and official venture capital funds), further: factoring, leasing, etc.

At the same time, the reality of the indicators for the Macedonian business sector's innovativeness, obtained from the State Statistical Office surveys, is significantly impacted

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by certain methodological challenges that were previously mentioned, as well as the subjectivity of enterprises representatives in responding to the survey questions.

All this shows that it is necessary continuously to be followed the methodological changes related to the survey of innovative business entities (initiated by the EC), but that it is also necessary to be increased the analytical approach capacities in answering the questions provided in the surveys, as well as in the processing and summarising of the answers, i.e. the obtained results.

This conclusion is further confirmed in the analysis of the innovativeness of the Macedonian business sector in the international reports.

3.1. European Innovation Scoreboard

The annual European Innovation Scoreboard (EIS), as a Report of the European Commission, provides a comparative assessment of the research and innovation performance of the EU Member States and selected third countries and the relative strengths and weaknesses of their research and innovation systems. This EC Report, whose one of the main aims is to help countries to assess areas in which they need to concentrate their efforts in order to boost their innovation performance, was officially introduced in 2001 (European Commission, 2017). North Macedonia, as the third country, has been included in EIS since 2010.

The innovation performance within the EIS is measured using a composite indicator – the Summary Innovation Index – which summarises the performance of a range of different indicators. Actually, the EIS measurement framework distinguishes between four main types of activities, capturing ten innovation dimensions and, in total, 27 different indicators. Framework conditions capture the *main drivers of innovation performance external to the firm* and cover three innovation dimensions: Human resources, Attractive research systems, as well an Innovation-friendly environment. *Investments* capture public and private investment in research and innovation and cover two dimensions: Finance and support and Firm investments. *Innovation activities* capture the innovation efforts at the level of the firm, grouped into three innovation dimensions: Innovators, Linkages, and Intellectual assets. *Impacts* cover the effects of firms' innovation activities in two innovation dimensions: Employment impacts and Sales impacts (European Commission, 2020).

The European Innovation Scoreboard 2020, which assesses the innovation performance of the countries in 2019, in addition to the EU-27 member states⁷, includes ten third countries: Iceland, Israel, Montenegro, North Macedonia, Norway, Serbia, Switzerland, Turkey, Ukraine and Great Britain, i.e. a total of 37 countries.

The Summary Innovation Index of North Macedonia in 2019, with a value of 44.5, shows that the country's innovation performance is at a level of only 44.5% of the EU average, which ranks the country on 34th place among 37 countries included in the EIS 2020 (Table 8). Although the summary innovation index in 2019 (44.5%) shows a significant increase

⁷ EU-27 member states: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain and Sweden.

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compared to the index from 2012, when it was 33.7% of the EU average, and a slight increase compared to the index in 2017 (44.2%), still, the innovation performance of North Macedonia remains at a level lower than 50% of the European average, due to which the country remains ranked in the group of countries – modest innovators.

Table 8

	Relative to EU 2019 in	Performance	relative to EU
North Macedonia	2019	in	2012
	2019	2012	2019
SUMMARY INNOVATION INDEX*	<u>44,5</u>	<u>33,7</u>	48,5
Numan resources	38,2	29,2	44,0
New doctorate graduates	18,7	22,7	20,6
Population with tertiary education	74,0	35,5	94,2
Lifelong learning	15,5	30,0	16,7
Attractive research systems	81,0	19,3	92,6
International scientific co-publications	17,2	12,6	25,3
Most cited publications	44,8	10,0	44,8
Foreign doctorate students	218,9	44,7	252,3
Innovation-friendly environment	50,8	56,3	88,4
Broadband penetration	47,8	70,0	110,0
Opportunity-driven entrepreneurship	N/A	N/A	N/A
Finance and support	13,1	41,5	15,1
R&D expenditures in the public sector	12,3	33,1	12,0
Venture capital expenditures	N/A	N/A	N/A
Firm investments	61,8	70,9	80,3
R&D expenditures in the business sector	5,3	0,0	6,1
Non-R&D innovation expenditures	113,9	159,7	159,7
Enterprises providing ICT trainings	66,7	69,2	92,3
Innovators	73,9	62,8	66,0
SMEs product/process innovations	73,6	68,6	73,3
SMEs marketing/organizational innovations	72,1	57,4	59,2
SMEs innovating in-house	N/A	N/A	N/A
Linkages	17,1	21,5	17,6
Innovative SMEs collaborating with others	61,1	71,9	60,7
Public-private co-publications	0,0	3,1	0,0
Private co-funding of public R&D expenditures	0,0	0,0	0,0
Intellectual assets	14,3	2,5	13,4
PCT patent applications	28,0	0,0	26,0
Trademark applications	6,2	9,4	6,6
Design applications	1,5	0,6	1,3
Employment impacts	6,7	18,1	7,2
Employment in knowledge-intensive activities	7,5	20,3	8,1
Employment fast-growing enterprises	N/A	N/A	N/A
Sales impacts	54,3	33,4	54,0
Medium and high-tesh product exports	118,2	63,7	131,1
Knowledge-intensive services exports	23,7	31,4	24,5
Sales of new to market/firm innovations	4.1	3,4	3,4

European Innovation Scoreboard 2020 - North Macedonia

Source: European Commission, 2020.

Lower ranked than North Macedonia in 2019 are Montenegro, Ukraine and Romania, with summary innovation indexes of 43.4%, 32.9% and 31.6% of the EU average, respectively.

Antovska-Mitev, M., Drangovska, T. (2022). Development of the Macedonian Business Sector and Its Innovation Activities from the Early Transition Years until Today (1991-2021).

Followed by North Macedonia (44.5%) is ranked Bulgaria with a summary innovation index that is 45.4% of the EU average (European Commission, 2020).

According to the latest EIS 2021⁸, North Macedonia, with a summary innovation index value of 41.9, is ranged in the fourth group of Emerging Innovators – countries that show a performance level below 70% of the EU average⁹. This group, besides the third countries, includes seven EU Member States – Bulgaria, Croatia, Hungary, Latvia, Poland, Romania, and Slovakia.

3.2. Productivity of the Macedonian business sector

In addition to modest innovativeness, North Macedonia also faces low labour productivity.

The issue related to the impact of innovation on the productivity of the companies, especially in the past twenty years, has attracted much attention due to today there is a rich literature that provides convincing evidence of a significant correlation between R&D, innovation, technological development and economic performance of the companies.

In economic theory, worldwide, there is general consensus on the treatment of productivity as one of the critical factors that determine the level of economic development of the countries, stimulate economic growth and lead to an increase in living standards (Butlin, 2012; World Bank, 2018).

Generally viewed, in economic theory, there are three basic types (indicators) of productivity:

- *Labour productivity*, which is defined as the ratio of the output to the number of units of labour engaged (workers), or as the ratio of the value added to the number of working hours;
- *Multifactorial productivity*, which measures the productivity where labour and capital are combined to produce a given quantity of goods or services. Multifactorial productivity is usually measured as a ratio of the value added and the number of units engaged from the respective inputs (labour and capital); and
- **Total factor productivity (TFP),** refers to the ratio between value added or output received and all inputs included in the production process (Butlin, 2012). In the total factor productivity, the treatment of inputs receive labour, capital, etc. and, i.e. *Solow*

⁸ European innovation scoreboard (EIS) 2021 is based on a revised framework, which includes new indicators on digitalisation and environmental sustainability, bringing the scoreboard more in line with the EU political priorities. Available at: https://ec.europa.eu/info/research-and-innovation/statistics/performance-indicators/european-innovation-scoreboard_en#european-innovation-scoreboard-202.

⁹ The group of Moderate Innovators includes less Member States as in previous EIS reports as the threshold with the next performance group has been increased. The group of Emerging Innovators, which in previous EIS reports was referred to as Modest Innovators, includes more Member States for the same reason. Available at: https://ec.europa.eu/info/research-and-innovation/statistics/performance-indicators/european-innovation-scoreboard_en#european-innovation-scoreboard_202.

- Economic Studies Journal (Ikonomicheski Izsledvania), 31(6), pp. 80-97.

residual, which refers to the part of the output growth that is result of education, knowledge, and technological progress in the broadest sense of the word.

In 2011 labour productivity in North Macedonia, measured as GDP per person employed, represented only about 57% of the EU-27 average (OECD, 2013). In 2015, the annual Macedonian SMEs productivity, calculated as the ratio of the created added value to the employment, was around EUR 8.800 per person employed, which is almost 80% lower than the EU average. Annual SMEs productivity in North Macedonia in 2017, measured as value added per person employed, is EUR 9.360, which is almost five times lower compared to the average of EUR 43.604 achieved by EU SMEs. Also, SMEs of North Macedonia employ an average of 5.3 people, significantly more than the EU average of 3.9. (European Commission, 2019). In the recent period has been noted a further deterioration in labour productivity in the country. The deterioration in labour productivity in 2020 reflects to a large degree the economic impact of the pandemic and the government's job-retention measures (European Commission, 2021).

Conclusions

The paper, based on a comprehensive analysis, provides a qualitative assessment of the development of the Macedonian business sector and its innovativeness from the early transition years (the 1990s) to the present day.

In the long and difficult transition process, marked by the privatisation process, many large industrial facilities were closed, which contributed to the rapid growth of unemployment in the country. This has moved the process of spontaneous entrepreneurship that resulted with a rapidly forming of small and medium-sized privately-owned enterprises. Within the spontaneous entrepreneurship process, entrepreneurs were left to choose the area they will invest, the way of providing funds for starting a business, etc. Furthermore, during this process, businesses were predominantly formed to ensure own livelihood of entrepreneurs and were mainly located in trade.

From the early transition years until today, the Macedonian business sector has improved both quantitatively and qualitatively.

Thus, the number of active business entities from 7.234 enterprises in 1990, has increased to 73.061 enterprises in 2020. Positive trends are also evident in terms of the sectoral distribution of enterprises, i.e. the share of active enterprises located in trade in total enterprises today is 30.4%, compared to 67% in 1996.

Compared to the early transition years, in North Macedonia today, significant progress has been achieved in the statistics for innovative business entities, as well as in the development of institutional infrastructure to support the SMEs sector and in the progress of its innovativeness.

Unlike the early transition years when there was not any official statistical data for innovative businesses in the country, so alternatively as data sources were used some regional surveys and own surveys of the researchers, from 2010 the situation has been improved significantly.

Antovska-Mitev, M., Drangovska, T. (2022). Development of the Macedonian Business Sector and Its Innovation Activities from the Early Transition Years until Today (1991-2021).

Starting from 2010 until today, the State Statistical Office has conducted four surveys and has published four reports with summary data on the innovative business entities on a national level:

- Survey 2010-2012, published in 2014;
- Survey 2012-2014, published in 2016;
- Survey 2014-2016, published in 2018;
- Survey 2016-2018, published in 2020.

Furthermore, starting from the early transition period until today, a significant institutional infrastructure has been established to support SMEs in the country, among which the main institutions are: the Agency for Promotion of Entrepreneurship of the Republic of North Macedonia, the Development Bank of the Republic of North Macedonia, Fund for Innovation and Technology Development, etc. In the recent period, also, numerous laws, acts, strategies and other documents have been adopted in order to act in the direction of improving the business climate in the country, increasing the capacity for enterprise innovativeness and strengthening the role of SMEs in the national economy.

Unlike the early transition years when most of the new formed private enterprises were with low financial status, primarily founded out of necessity and could hardly be labelled as entrepreneurial firms, today, the participation of innovative businesses in the overall business community in the economy, according to the SSO data, is fluctuating in the following ranges: 42.8% in the period 2010-2012, 36% in the period 2012-2014, 37.4% in the period 2014-2016 and 55% in the period 2016-2018.

However, despite the evident qualitative progress in the development of the Macedonian business sector and its innovativeness in the past 30 years, North Macedonia still remains in the group of countries – modest innovators, with innovation performance lower than 50% of the EU average, and extremely low labour productivity, which to this day remains almost five times lower than the European average.

To improve the situation in terms of innovation and productivity of the business sector in the Macedonian economy, it is especially important to be taken measures in the following areas:

- Increment of the total R&D expenditures, especially R&D expenditures of the business sector;
- Improvement of the enterprises' access to funds for supporting of innovation activities and R&D;
- Harmonisation of the Macedonian formal education system according to the labour market requirements;
- Continuing education of the employees in the business sector;
- Increment of the entrepreneurial awareness of the importance and benefits of introducing innovation;
- Increment of the competitive pressure on the Macedonian economy etc.

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Volume 31(6), 2022

LIFE INSURANCE PENETRATION DRIVERS IN BULGARIA²

The need for security and protection of human life and health is the very cornerstone behind life insurance demand which has become larger with the current COVID-19 atmosphere. Life insurance penetration is significantly lower in Bulgaria compared to the EU average, while studies on the subject of how this development came about are almost absent. In that regard, this article is focused on the influence of major macroeconomic, demographic and competitive factors over life insurance penetration in Bulgaria. When it comes to the methodological aspect, the study is based on the theory of demand and industrial organisation by applying the descriptive and correlation analysis methods. The results underline that despite the positive trends in life gross premiums, written for the period of 2009-2020, Bulgarians prefer to allocate their excess funds towards alternative investment opportunities. To a large extent, this is attributed to the low amount of income and the low productivity of the economy as well as because of the lack of effective competition between the small number of insurance companies. From the customers' point of view, this leads to a lack of awareness of the benefits of insurance, distrust and the absence of insurance interest, all of which are intensified during COVID-19. Responding to the market in relation to new business, supplying flexible, personalised and hybrid varieties of products, omnichannelling and development of positive attitudes among the population are all regarded as basic guidelines, used to improve insurance penetration. This article, therefore, serves as a foundation for a more in-depth study of the Bulgarian life insurance market, a stimulus for increasing the financial literacy of the Bulgarian populace and a subject of interest for insurance companies themselves in their fight to promote activity and to unleash market potential.

Keywords: life insurance; penetration; determinants; life insurance market JEL: G22; L10; M21

1. Introduction

The sense of security is one of the basic human needs, which stimulates the need for protection from the risks of life and encourages the development of the life insurance market. The relevance of life insurance has never been higher for a large part of the world's

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² This paper should be cited as: *Hristova, Y. (2022). Life Insurance Penetration Drivers in Bulgaria. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 98-119.*

population during the COVID-19 pandemic despite the presence of inconsistencies in its effects as a result of the increase in income uncertainty and the prerequisites for inflation.

The necessity for a developed life insurance market is supported by its significance as an engine of propensity to save, a transfer of risks, their effective management and profitable implementation, peace of mind for people in their professional and private life and a source of stimulation for the overall economic growth. In developed countries, these advantages have been successfully introduced and life insurance takes up a stable and significant part of the financial sector. In developing economies such as Bulgaria, despite or as a result of the economy, healthcare and societal norms turbulences, business related to health and life insurance of the population increases its significance, but at the same it substantially falls behind by preference. Life insurance penetration in Bulgaria is 9 times weaker than the average for the EU for both 2019 and 2020 and the prominence of life insurance is measured by its density which is 2.7% of the EU's mean. Studies on the reasons behind this trend are almost non-existent, while insurance companies that are in competition with each other take individual decisions to perfect their operations, as a result of which the quality and distribution of life insurance services are affected throughout the entire market. However, this is not enough to generate sufficient consumer confidence. The question as to what the drivers of development of life insurance activity are is a relatively common one among researchers and it focuses on economic, political and demographic factors of the macroenvironment that are reviewed for a limited amount of time and within a select number of countries. A paper on the influence of these determinants, along with the factors that govern the competition in the Bulgarian market, sheds light on the approach to create stability in sales and generate an insurance interest among the Bulgarian populace.

In this context, the aim of the current study is to determine the reasons behind the weak life insurance penetration in Bulgaria by evaluating the force and direction of influence of a range of economic, demographic and competitive factors for the period 2009-2020, and as a result, a few recommendations are proposed to perfect insurance activity.

To accomplish its goal, the paper aims to execute the following main tasks:

- To theoretically describe the essence and primary determinants of life insurance activity.
- To develop a methodology to study the impact of factors on life insurance interest and penetration.
- To track the development of the Bulgarian life insurance market in comparison to the EU's, the competitive intensity and its overall impact on the life insurance market.
- To assess the direction and the amount of influence of 32 macroeconomic, demographic and competitive factors that impact life insurance penetration in Bulgaria, and on that basis, to provide a few guidelines for improvement of life insurance activity.

The study has several limitations. First, it is related to the 12-year time period (from 2009 to 2020) and the economic changes that have occurred during it. Second, the studied processes of the Bulgarian insurance market have been covered in relation to its territorial scope, without affecting the paper on the factors in other countries, however, a comparison was made of the gross premiums written, insurance penetration and density in the EU. Third, only

the life insurance segment has been studied. Fourth, only a part of the macroeconomic, demographic and competitive factors that have influenced life insurance penetration, have been subjected to evaluation.

The Fundamental hypotheses of this paper consist of:

H₁: The Bulgarian life insurance market is significantly less developed compared to Europe's in terms of insurance penetration and density.

 H_2 : Despite its conditionally insignificant value, the contribution of life insurance to the Bulgarian GDP has been increasing throughout the years and has the potential for development.

H₃: COVID-19 has an ambiguous impact on life insurance in Bulgaria.

 H_4 : The life insurance market is determined to be less competitive with high concentration, a decreasing number of participants, an uneven market distribution between them, good management of revenue and expenditures but with poor profitability. The high market concentration, the gross premiums were written and the unevenness in its distribution have a positive impact on the interest in life insurance, while the decreasing number of competitors and their expenditures have a negative effect.

H5: The macroeconomic and demographic environment factors have an ambiguous meaning which doesn't always match the conclusions in the study of other countries. The most significant factors from this group are considered to be: insurance density, GDP per capita, average income per capita, gross savings, real interest rate, Gini index, social contribution, inflation, urban population, deposits, substitutes products, dependency ratio, education, life expectancy at birth.

2. Theoretical Aspects of Life Insurance and Its Drivers

Insurance constitutes an activity focusing on the allocation of resources in the present moment with the purpose of future risk aversion. Life insurance expresses a transaction between two parties – the insurance company and the insured person, according to which the insured person fulfils a price (an insurance premium) in the present moment to be provided protection from the occurrence of an insurable future event, which has been achieved via compensation from the insurer. Good developments of the life insurance market provide advantages to individuals, businesses and society as a whole in the following areas (Carmichael, Pomerleano, 2002; Cristea, Marcu, Cârstina, 2014; Skipper, 2001; Peleckiene at al., 2019):

- the transfer of risks towards insurance companies and the establishment of security and protection for firms and households;
- the long term accumulation of resources for the elderly persons, which increases the tendency towards long term savings;
- the generation of value, liquidity, uniting and managing the risk via redistribution of incomes between economic agents;

- alleviating the pressure on the national budget by substituting the state insurance pensions;
- the stimulation of entrepreneurial and innovative activities, effective market competition and the profitability of the industries, via raising the risk tolerance of the economic agents and optimising the risk insurance companies take.

The significance of the insurance activity raises the question of what its actual influence on the nations' economic growth is, which is a subject of studies with a different scale and toolbox. Although insurance is regarded as a relatively stable part of the financial sector, its contribution to the economic growth is not unequivocal and depends on the conditions fostered by the specific states (Ward, Zurbruegg, 2000). The basis of the studies is built on two indicators: insurance penetration which represents the share the insurance premiums have in GDP, and insurance density which serves to measure the monetary worth of an insurance premium that a single person is able to pay (Podoabă, 2015; Peleckienė at al. 2019). Cross-country studies attest that in less developed economies, insurance activity has no significant effect on economic growth in contrast to the better-developed ones (Kjosevski, 2012; Carmichael, Pomerleano, 2002; Cristea, Marcu, Cârstina, 2014; Pradhan, Bahmani, Kiran, 2014). In Bulgaria, which has one of the weakest economies in the EU's composition, insurance activity has no deciding role in determining the economic well-being; however, life insurance is considered a potential good investment. In that regard, the stimulation of the insurance activity should become a priority of every government while the research on the drivers of its growth provides a necessary condition to guarantee insurance penetration and density.

Deducing what the factors that result in a developed life insurance market are, is a question of analysis amongst a number of studies. Macroeconomic, demographic and political determinants are at the forefront when seeking for insurance products (Table 1). A country with a smaller population size but with a high GDP, personal income and household savings, high levels of real interest rates, financial and political stability, low inflation and unemployment, an educated population predominantly of working age, normative regulation of insurance and good healthcare is a benchmark for favourable terms needed for the purchase of life insurance by both business and consumers. All of these factors are intrinsic to the high development of technologically advanced countries, which logically speaking have higher rates of insurance density and penetration. Developing states are further away from the set standard, which leads to a more ambiguous relevance of insurance over the economic growth (Carmichael, Pomerleano, 2002). The influence of some determinants such as the savings norm, interest rate, income inequality, population count, dependency ratio and social security is regarded by some researchers as unclear. The bigger amount of savings, as well as the advantages of the higher interest rate on deposits, can be allocated to a life insurance product. Nevertheless, this is an individual decision that every person makes that can be directed towards a different asset with a shorter-term return. The bigger income inequality of the populace leads to the rich not needing life insurance while the poorer have no funds. Nevertheless, even the relatively stable presence of the middle class in the community does not guarantee demand and the amount of income which is put aside for life insurance. Increasing the size of the population provides a bigger pool of potential clients for life insurance companies, though if that is not accompanied by an increase in the well-being of the economy, the demand for life insurances will decline alongside with insurance density.

Table 1

Influence of the Macroeconomic, demographic and political drivers over insurance
penetration

Driver		Influence over insurance penetration		
Macroeconomic drivers:	GDP per capita	Positive (Carmichael, Pomerleano 2002; Kjosevski, 2012; Peleckienė at al., 2019: Li at al. 2007; Browne, Kim. 1993)		
	Income per capita	Positive, with high elasticity (Carmichael, Pomerleano, 2002; Cristea, Marcu, Cârstina, 2014; Ward, Zurbruegg, 2000; Li at al., 2007; Beck, Webb, 2003) Hwang, Gao, 2003; Frees, Sun, 2010; Enz, 2000; Luciano, Rossi, Sansone, 2015; Browne, Kim, 1993)		
	Annual savings rate	Ambiguous (Beck, Webb, 2003) Positive (Lim, Haberman, 2004; Sulaiman, Migiro, Yeshihareg, 2015)		
	Inflation	Negative (Li at al., 2007; Hwang, Gao, 2003; Luciano, Rossi, Sansone, 2015; Mapharing, Otuteye, Radikoko, 2016; Sulaiman, Migiro, Yeshihareg, 2015)		
	Unemployment	Negative		
	Healthcare expenditures	Positive (Kjosevski, 2012)		
	Interest rate	Positive (Beck, Webb, 2003; Lim, Haberman, 2004) Ambiguous (Li at al., 2007; Mapharing, Otuteve, Radikoko, 2016)		
	Gini index	Ambiguous (Beck, Webb, 2003)		
	Assets, debt	Positive (Frees, Sun, 2010; Luciano, Rossi, Sansone, 2015)		
	Insurance premium	Negative (Hwang, Gao, 2003; Lim, Haberman, 2004; Browne, Kim, 1993)		
	Financial stability	Positive (Lim, Haberman, 2004; Li at al., 2007)		
	Population	Ambiguous		
::	Age	Positive (Luciano, Rossi, Sansone, 2015; Lin, Grace, 2007)		
Demographic driver	Urbanisation	Positive (Carmichael, Pomerleano, 2002; Luciano, Rossi, Sansone, 2015; Beck, Webb, 2003)		
	Dependency ratio	Positive (Sulaiman, Migiro, Yeshihareg, 2015; Li at al., 2007; Browne, Kir 1993; Mapharing, Otuteye, Radikoko, 2016) Ambiguous (Beck, Webb, 2003; Luciano, Rossi, Sansone, 2015)		
	Education	Positive (Li at al., 2007; Browne, Kim, 1993; Mapharing, Otueye, Radikoko, 2016; Lin, Grace, 2007; Beck, Webb, 2003; Carmichael, Pomerleano, 2002)		
Political drivers:	Tax reductions	Positive (Carmichael, Pomerleano, 2002)		
	Political stability	Positive (Carmichael, Pomerleano, 2002)		
	Pension insurance expenditures	Negative (Li at al., 2007) Ambiguous (Browne , Kim, 1993; Mapharing, Otuteye, Radikoko, 2016)		
	Normative regulation of the market	Positive (Carmichael, Pomerleano, 2002)		

Source: composed by the author.

Although economists are unanimous as a whole on the positive influence of the share of persons under 15 and over 64 in the working-age population, several studies (Beck, Webb, 2003; Luciano, Rossi, Sansone, 2015; Browne, Kim, 1993; Li at al. 2007) establish a stronger positive influence of the old dependency ratio. Social insurance may be viewed as a substitute for life insurance which gives birth to a negative relationship between the measurements. At the same time (Browne, Kim, 1993) it is speculated that social pension insurance might not

decrease the demand for life insurance products due to the fact that other than having a savings element, it also offers protection, i.e. life insurances can add to the retirement system.

Throughout the past two years, the COVID-19 pandemic has had a substantial influence on all economic activities, including life insurance. On the one hand, the rise in mortality rates due to the virus, and government restrictions that are meant to delay its spread lead to a surge in life and health risks which prompts a necessity for life insurance. On the other hand, the pandemic leads to a high level of income insecurity, unemployment probability, and an increase in life insurance product prices as a defence mechanism from companies, all of which are factors that decrease its demand. Studies on the impact of the pandemic on life insurance activity foresee a short term outflow of revenue in the market and a differentiated uptick in pricing for the highest-risk groups of the population (Harris, Yelowitz, Courtemanche, 2021). That way, the influence of the pandemic on life insurance penetration is ambiguous.

Macroeconomic, demographic and political factors have an undeniable impact on the development and spread of the insurance business, however, the final choice to be made for life protection and the allocation of funds is taken by the consumers. Insurance interest is particularly important for life insurance that has more of a voluntary rather than compulsory nature, and is independent of factors related to human behaviour, financial literacy and satisfaction. In Bulgaria, as well as in other developing countries (Omar, 2007; Ahmed, 2013), there are causes such as a lack of trust and a low level of awareness of the benefits of life insurance products which could be viewed as reasons for the low insurance penetration of the market (Hristova, Peeva, 2018). Even though life insurance is meant to respond to one of the primary needs – the one of security, in practice, that same need is not considered an essential service by society. For consumers residing in countries with low income, the choice of insurance often significantly increases opportunity costs meant for the distribution of disposable income and that is a determinant of rejection. Unlike non-life insurance, which offers protection against a taken risk, life insurance also has a savings purpose that makes it a variant for money investment, along with bank deposits, collective investment schemes and alternative funds, and investment in real estate and in stock markets. The individuals have the choice of allocating funds dependent on the size of their income. They choose to save, spend or invest money. In the case of investment decision, they decide whether they can afford to choose from a portfolio of investments or if every separate investment may be regarded as a trade-off with the rest.

The root causes behind the consumer's unwillingness for insurance can also be found in the characteristics of life insurance as a service. Considering the fact that it serves as an exchange of utility, one side providing it to the other and it does not lead to the acquisition of a material product (Kotler, 2009; Lovelock, Wirtz, 2011), life insurance possesses the attributes of immateriality, indivisibility and heterogeneity of all services which makes its benefits difficult to perceive and assess. The generation of consumer confidence with these features aims to create "awareness" and "visibility" of the results of the proposed offer, its personalisation to the customers' requirements (Frei, 2006), the quality, price and various options to choose from, the flexibility of production (Lovelock, Wirtz, 2011). The process of a sale has the purpose of offering a method of resolving a specific problem that is not incurred at the moment; however, it might surface in the near or distant future, and as a result, this

concrete feature unlocks negative attitudes and mutual mistrust between counterparties (Poth, 2014; Gidhagen, 2002). The consumption of traditional services is accompanied by a particular psychological and financial risk since the production of services coincides with their use, while the result from said services is different for every consumer because of the heterogeneity in the offering. In life insurance, the consumer risks can be considered as even higher.

The customer uses the life insurance service preventively, without knowing if and when its realisation will occur. The issue is further exacerbated by the emergence of two circumstances: (i) compensation when an insurance event takes place, such as the death of the person, is disbursed to the relatives of the deceased, i.e. there is a lack of real benefit for the insured from the paid out compensation; (ii) an unwillingness between both sides of the deal to reach an actual "delivery" of the service (the client doesn't want an insurance event to happen which would disrupt the normal progress of life or for a threat to occur, while the insurer doesn't want to cover any incurred insurance events which would prompt a compensation payment) (Poth, 2014; Gidhagen, 2002). The preliminary use of the life insurance service carries an element of uncertainty for the customer, on whether it's worth it to pay for something that might not happen. In this sense, convincing the client of the necessity of insurance is a challenge for the sales agent, while the advantages of the insurance contract are hard to evaluate not only before and during but also after making the purchase.

The insurance interest of the population is a major factor for life insurance product demand. In order to find motivation for purchase, the potential consumer should have a positive attitude towards this kind of activity, social and reference groups to which he or she belongs to. For the purpose of having actual or potential users of the product, the customer is to be risk aversive, financially liberated and prone to saving, to be able to distribute and invest wealth throughout the passage of time (Nomi, Sabbir, 2020). Such type of consumer motivation is a prerequisite for confidence-building, awareness of the benefits of life insurance and the formation of their demand. Consumer expectations towards life expectancy are regarded as an important purchase deciding factor (Browne, Kim, 1993). A person whose prospects indicate a short life would be more willing to apply insurance (Browne, Kim, 1993; Li at al., 20070, however, if the foreseeable future suggests a longer life expectancy, said insurance would be applied as an investment for the elderly years (Beck, Webb, 2003; Lim, Haberman, 2004). As a result of the increase of average life expectancy, the goal of the products would be more likely related to health protection rather than after the fact compensation (McKinsey, Company, 2020). The response to consumer expectations before (by using adequate media and awareness), during (by proposing the right offer in regards to product and price), and after the signing of the contract (via transparent information, feedback, proper payout of compensations) is marked as the cornerstone of customer satisfaction and therefore insurance penetration rises.

The attraction of clients to life insurance, especially in countries with an unfavourable economic and demographic development, is a constant struggle between existing competitors while satisfying their wants – the main objective. According to the structural approach to the competition, a well-developed market has built up protective mechanisms from the negative influence of market forces such as suppliers, new competitors, substitutes and customers, which in consequence, reduces competitive aggression and increases profitability (Porter,

1979). The more effective and dynamic a rivalry is in the life insurance market, the more attractive and diverse the proposed offers are, and the bigger the audience for the companies when presenting their goods. The competitive determinant of insurance penetration requires a multitude of firms with a good image and reputation (Eccles, Vollbracht, 2006), with a stable and successful market position (Eling, Kiesenbauer, 2012), that offer quality service in a flexible way via creative management of the business, meeting consumer expectations in conditions of digitalisation (Selimović, Martinović, Hurko, 2020; Brown, Goolsbee, 2002). The high market concentration and force of the insurance companies drive the average level of market profitability and guarantee its stability (Shim, 2017). Effective market competition is an incentive for improvement of the trade offers from the perspective of their quality, varieties and price attractiveness (Mburu, Maina, 2016) which are a factor for the increase in demand (Selimović, Martinović, Hurko, 2020). Accomplishing a parallel balance between the competitors' propositions and user satisfaction with the service and the experience of it, is an essential factor for a better life insurance penetration.

The determinants of the insurance penetration are rooted not only in the factors of the economic, demographic and political macro-environment but also in the personal preferences of the clients and the competitive factors of the industry. The importance of the life insurance activity on the development of the national wealth and prosperity is what makes it necessary to study the effect of these factors and to solve any possible problems related to life insurance penetration and density.

3. The Methodology Used to Evaluate the Influence of the Life Insurance Penetration Drivers

The current research aims to determine the influence of economic, demographic and competitive determinants on the level of penetration of life insurances in the Bulgarian market. Life insurance penetration (form 1) besides life insurance density (form 2), is a criterion for the significance of this type of financial service that adds value to the economy and is an indicator of its development and entry, which allows a comparison between other states and time periods.

$$Life insurance penetration = \frac{life gross premiums written}{gDP} \times 100$$
(1)

$$Life insurance density = \frac{life \ gross \ premiums \ written}{population}$$
(2)

The study is based on descriptive and correlation analysis. To determine the force and direction of influence of the factors over insurance penetration, the Spearman's Rho correlation coefficient is utilised. Its preference over the standard Pearson's correlation coefficient is established on the limitation of the time series in the paper, the multitude of factors and the lack of sensitivity towards extreme variables, unusual and abnormal measurements.

The period of research spans the period of 2009 to 2020 (12 years), on the one hand, aiming to indicate the impact of the economic crisis that took place from 2009-2010 and the beginning of the Covid-19 pandemic in 2020, and on the other having the goal to signify the long term character of the investment of the life insurance product.

The choice of the scope and composition of the studied factors is based on previous research of the problem in question, the specifics of life insurance in Bulgaria and the necessity to cover the bigger number, different in nature, with quantifiable indicators. The necessary data for evaluating the influence of the different factors have been extracted from secondary sources such as the Bulgarian Financial Supervision Commission (FSC), the National Statistical Institute (NSI), the Bulgarian National Bank (BNB), The World Bank (WB).

The macro drivers whose influence over insurance penetration is studied, are shown in fig.1. Since these are determinants with a significant yet unchangeable by any economic subject impact, their directions and force are determined as a circumstance that the business has to take into account.

The factors of the competitive environment are directly dependent on the activity and strategies of the insurance companies that change the image of the life insurance market. The larger amount of competitors, the higher the concentration on the market, the effectiveness of their activity and the aim to attract incomes more successfully than the other sources of resource allocation are the competitive drivers of life insurance activity. The higher income of all of the insurance companies on the market (life gross premiums written) attests to their collective success in client attraction which is directly associated with the growth in insurance penetration and density. The number and, to a bigger degree, the size of the enterprises are of importance to measure their ability to distribute their services on a bigger scale, invest in innovations, change consumer perception and popularise their activity. This study focuses on two main indicators of concentration as a factor of investment penetration:

• The concentration Ratio of 4 biggest firms (CR4) in % is the sum of the market shares of the four largest companies in the industry.

$$CR_4 = \sum_{i=1}^4 MS_i \tag{3}$$

Where: MSi - market share of rival 'i', (i=1, 2, 3, 4). When CR4<50, the market concentration is low and the market is normally competitive; CR4 is between 50% and 85%, the concentration is in the middle and the market is relatively competitive; CR4>85, the concentration is high and the market is lowly competitive.

• Herfindal-Hirshman index of concentration (HHI) in % is the sum of the squares of the market shares of all market companies.

$$HHI = \sum_{i=1}^{n} MS_i^2 \tag{4}$$

Where: MSi – market share of rival 'i', (i=1, 2,n). When HHI<1000, the market concentration is low and the market is normally competitive; HHI between 1000 and 2000,

the concentration is average and the market is relatively competitive; HHI>2000, the concentration is high and the market is lowly competitive.

Figure 1

Macrodrivers of insurance penetration - definition and source of data

GDP per capita, BGN Gross domestic product divided by midyear population. GDP measures the value of total final output of goods and services produced by an economy within a certain period of time. Source: WB		Average income per capita, BGNThe a deductionThe total income (monetary and valued income in kind) of the household and its members divided by midyear population.The a deductionSource: NSISource		Gross savings, BGN mount remaining after ting total consumption from m of gross national income et transfers. e: WB	
Real interest rate, % The lending interest rate adjusted for inflation as measured by the GDP deflator. It is a reflection of the change in purchasing power derived from an investment or given up by the borrower. <i>Source: WB</i>		Gini index, % Measures the extent to which the distribution of income among individuals or households deviates from a perfectly equal distribution. A value closer to 100 % indicates a higher inequality.	So Comp gover (cond benef protec life, a conse	Social contributions, BGN Compulsory payments to the government that entitle to (conditional) future social benefits, which can be financial protection against major risks to life, accidents at work and their consequences.	
Inflation, consumer prices (annual %) The annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. Source: WB		Urban population, % of total population Refers to people living in urban areas divided by total population. Urbanization is associated with the processes of industrialization 4.0 and increased risk to human health. Source: WB	The s young age p (youn ratio o worki depen <i>Sourc</i>	Source: WB Dependency ratio, % The sum of ratio of people younger than 15 to the working- age population (those ages 15-64) (young dependency ratio) and ratio older than 64 to the working-age population (old dependency ratio). Source: WB	
Education graduate, % of inhabitants The share of graduates (secondary and tertiary) education in the total population. A bigger share means that users are more informed and sciential. Source: NSI	Schoo the rat popula corresp level o Educa The pe attaine equiva Source	I enrollment, % gross io of total enrollment, regardless of age ition of the age group that officially ponds to the level of education shown. ' of education can be secondary or tertiary ational attainment, total (%) ercentage of population ages 25 and over d or completed a Bachelor's degree or i lent. e: WB	, to the The V. er that ts	Life expectancy at birth, years Indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. Source: WB	

Source: Composed by the author from sources cited in the figure.

Other than the concentration levels, the relative and absolute changes in the distribution of the market shares between competitors in the time spent and the evenness of the division of the market itself plays a role in insurance activity. The higher value of ICSCMD (Gatev, 2007, p. 44) (see form 5) affirms the higher level of instability and insecurity in the market positions and that results in a loss in customers, disinterest and distrust in the firms' activity. The larger unevenness of the division of the industry's profits, measured by the ICIMD (Gatev, 2007, p. 124) (see form 6), presents consumer preference towards the type of firms that are more popular and better instead of the others. This preference is evidence of low concern for the client in regards to the smaller enterprises, while in the entire market, there is a decline in insurance customer interest, which are being served by ineffective rivals; unhappy with their service and from potential clients that have been overlooked due to the lack of capacity.

Table 2

Indicator	Formula			
The Integrated Coefficient of Structural Changes in market	ICSCMD = $\sqrt{1 - \frac{2\sum_{i=1}^{k} MS_{it-1} \times MS_{it}}{\sum_{i=1}^{k} MS_{it-1}^{2} + \sum_{i=1}^{k} MS_{it}^{2}}}$	(5)		
distribution (ICSCMD)	where: MS_{it} – the market share of rival 'i' in moment 't'; MS_{it-1} – the market share of rival 'i' in the 't-1' moment; k – the number of rivals. Source: author's calculation by data from FSC			
Integrated Coefficient of Inequality in market distribution (ICIMD)	ICSMD = $\sqrt{1 - \frac{20000}{10000 + \sum_{i=1}^{k} MS_{it}^{2}}}$ Source: author's calculation by data from ESC	(6)		
Return on Equity (ROE), %	$ROE = \frac{\sum_{i=1}^{n} Net \ Income_{it}}{\sum_{i=1}^{n} Equity_{it-1} + \sum_{i=1}^{n} Equity_{it}} \times 100$ Source: author's calculation by data from FSC	(7)		
Return on Assets (ROA), %	$ROA = \frac{\sum_{i=1}^{n} Net \ Income_{it}}{\sum_{i=1}^{n} Assets_{it-1} + \sum_{i=1}^{n} Assets_{it}} \times 100$ Source: author's calculation by data from FSC	(8)		
Return on gross premiums written (RGPW), %	$RGPW = \frac{\sum_{i=1}^{n} Net \ Income_{it}}{\sum_{i=1}^{n} Gross \ Premiums \ Written_{it}} \times 100$ Source: author's calculation by data from FSC	(9)		
Return on net premiums earned (RNPE), %	$RNPE = \frac{\sum_{i=1}^{n} Net \ Income_{it}}{\sum_{i=1}^{n} Net \ Premiums \ Earned_{it}} \times 100$ Source: author's calculation by data from FSC	(10)		
Combined Ratio (CR), %	$CR = \frac{\sum_{i=1}^{n} Losses_{it} + \sum_{i=1}^{n} Operating Expenses_{it}}{\sum_{i=1}^{n} Net Premiums Earned_{it}} \times 100$ Source: author's calculation by data from FSC	(11)		

Formula of calculation of part of the competitive factors of Bulgaria's insurance penetration

Source: Composed by the author from sources cited in the figure. The acting formulas are standardised by international accountant standards and widely used to evaluate the achieved results of the enterprise in comparison to past periods and compared to competitors (Revsine, Collins, Mittelstaedt, 2012).
The higher levels of the overall efficiency and profitability on average for the entire market indicate the success of all enterprises that function within it (see forms 7, 8, 9, 10, 11). The better resource utility, optimisation of the costs and stimulation of profits from all the firms on the market leads to its success and to the increase of its significance not only for direct competitors but also for their counterparties. The lack of success has the opposite effect, i.e. it redirects the consumer's income toward alternative opportunities for allocation of funds. The current study considers such bank deposits as investments in real estate presented via the sum of revenues from the operating activity and financial revenues in the sector "Real estate activities"³ and collective investment schemes (CIS) and alternative investment funds (AIFs). Unlike life insurance, they do not have a protective element, but make it more flexible, profitable and timely to get a return on investment and other benefits for investors.

4. An evaluation of Life Insurance Penetration in Bulgaria and Its Drivers

The Bulgarian life insurance market has been one of the most well developing ones in the last decade (Table 3). With the progress of the pandemic in 2020, gross premiums written by life insurance companies in Bulgaria have decreased by 11.47%, in accordance with the Europe-wide trend. Despite that, compared to the first year of the period, in contrast to the EU's revenue reduction of 6%, the Bulgarian life insurance market has grown by 96.53 out of a hundred. There is a strictly positive trend that can be observed during the non-crisis years, while the penultimate 2019 marks a growth of 11.34% and is at complete odds with the common European decrease of 9.18 out of a hundred. This illustrates the potential for the development of this type of products in Bulgaria. The amount of life benefits paid increases for the period with the exclusion of 2009 and 2018, and takes up an average of 40% of the premium return. On the one hand, the high sum of compensations provides evidence for the presence of risks related to the life and health of the Bulgarian populace; on the other hand, it also verifies the proper realisation of the insurance service in accordance with the signed insurance policies. Contrary to expectations for an increasingly serious necessity for protection and security of the most important thing – human life and health, a few negative trends in life insurance can be observed in Bulgaria:

- a drop in life premiums written during the life-threatening COVID-19 pandemic in 2020;
- low life insurance density;
- low, with fluctuating trends, life insurance penetration;
- negative trends in the life insurance market competition.

³ The sector encompasses a range of services relating to the provision of property, i.e. buying, selling and renting of commercial and residential properties or land. This division also includes the activities of real estate agents intermediating in buying, selling, letting or managing real estate.

40.90

2498.0

54

30.18

-18.85

38.96

2436.0

42.11

14.76

4.4

Share in life premiums

Growth rates. %

Growth rates, %

Table 3

0 1		,	pe	eriod	5	0			
	2009	2013	2014	2015	2016	2017	2018	2019	2020
Life gross premiums written in EU, BGNm									
	1362406	1305118	1417066	1484352	1422762	1479198	1560202	1416984	1280650
Growth rates, %	8.80	3.73	8.58	4.75	-4.15	3.97	5.48	-9.18	-9.62
Life gross premiums written in Bulgaria, BGNm									
	224.66	305.94	340.64	391.27	428.09	428.66	447.94	498.73	441.52
Growth rates, %	-19.30	14.12	11.34	14.86	9.41	0.14	4.50	11.34	-11.47
Life benefits paid in Bulgaria, BGNm									
	91.88	119.20	140.52	154.91	171.42	186.70	162.31	177.72	196.47
Growth rates, %	-2.25	11.49	17.89	10.24	10.66	8.91	-13.07	9.50	10.55

41.25

2596.0

47.15

11.98

6.6

Life gross premiums written, and life insurance density in Bulgaria and EU in 2009-2020

Source: Author's calculations based on data from Insurance Europe, FSC and NSI.

Density in EU, BGN per inhabitant

Density in Bulgaria, BGN per inhabitant 54.51

39.59

2650.0

15.60

2.1

40.04

2622.0

-1.1

60.06

10.18

43.5

2748.0

60.58

0.87

4.8

36.2

2898.0

63.76

5.25

5.5

35.63

2608.0

-10.0

71.50

12.13

44

2356.0

-9.1

63.74

-10.85

In 2020 when the COVID-19 pandemic began, there was an outflow of revenue of 11.47% compared to 2019. This decrease is unexpected considering the main goal of the service purchase of protection of human life and health. The outflow of revenue of the market led to a reduction of the already low life insurance density, penetration and a limitation of effective market competition. The lack of interest Bulgarians display towards the offered products is so low that if a European has an average of 2608,0 BGN gross premiums written, then at the same time, during the most successful year of the life insurance market, a Bulgarian would have a value of 37 times lower (71.5 BGN), the ratio in question remaining unchanged during the last year as well. The economic importance of life insurance to the Bulgarian economy is increasing, but it's also less pronounced (Figure 2). Values between 0,28% at the beginning of the period to 0.49% in 2019, and 0.45% in 2020 are irrelevant for the generation of value added for society. These measurements are also several times lower than the average for the EU despite the trend of penetration reduction in European countries. Bulgaria cannot manage to impose insurance, life insurance in particular on a bigger scale, whose nature is voluntary, as a stable financial favour and to ensure the benefits of the developed life insurance activity for the economy, public and individual persons.

The reduction of life insurance activity of the population leads to a decrease in effective competition on the market and to an even bigger outflow of resources towards other financial services and sectors of the economy. The number of players in the life insurance market diminishes every year for the period, 2020 marking only 10 life insurance companies that offer and distribute products (Table 4). The instability in market development instigates the appearance of the permanent processes of horizontal integration (firm merging and injections) and the refusal of some of them to pursue activity. Market positions also change in the presence of competitors. Allianz Bulgaria Life ZAD played a leading role in 2017 in the top 4 companies; however, in 2018 it lost its position to Bulstrad Vienna Insurance Group AD and DZI Life Insurance EAD, the latter accumulating a large turnover as a result of the merge of two competitors into its composition. In 2020 DZI Life Insurance EAD pushes out even Bulstrad Vienna Insurance Group AD from the top place, and with a market share of 25.8%, it takes the lead in the competition for the Bulgarian consumer.

Figure 2



Life insurance penetration in Bulgaria and EU in 2009-2020 period, %

Source: Author's calculations based on data from Insurance Europe, FSC and NSI.

The horizontal integration processes have a competitive advantage for the companies, firstly due to the number of direct competitors decreasing in the industry, and for a second time by uniting the clients of the merged firms. The reduction of direct rivals leads to an increase in market concentration while during that entire period, HHI is over a 1000 and growing, which defines the market as relatively competitive with an average level of concentration. In 2019 the indicator acquires a value of 2007% that signifies a reduction of competitive pressure, a presence of a small number of big players in the market who have opportunities to apply concerted practices in pricing behaviour. The declining intensity of rivalry is confirmed by an increase in shares of the first four companies from 58,46% in 2009 to 84,15% in 2020. There is practically no revenue for smaller firms, nor is there any room for new competitors. The market's status quo has remained the same during the entire 12-year period of study (geom.mean of ICSCMD =0.11), and the difference in position between first and last place is over 60 times. The asymmetry in market distribution is huge and the gap only gets bigger with time (geom.mean of ICIMD =0.58), while the number of rivals decreases, leaving the market development in the hands of the "big fish". On the one hand, the availability of big players on the market unreservedly points to a well built-up image and successful strategies. On the other hand, the lack of intensive rivalry implies the risk of the few being incompetent competitors despite being large, which might prompt them to circulate and popularise the life insurance product and have them market it as something that's necessary and significant for the life, health and savings of the Bulgarian consumers.

Table 4

Figure 2

Dynamics in market positions of Top 4 life insurance companies and indicators of
competition intensity in 2009-2020 period

	2009	2013	2014	2015	2016	2017	2018	2019	2020
Dynamics in market position of bigg			gest insurance companies in Bulgaria, Market share %						
Allianz Bulgaria Life ZAD	21.90	22.41	23.07	26.50	26.28	23.47	19.09	18.11	22.91
DZI Life Insurance EAD	15.44	9.95	9.77	12.09	11.26	12.04	22.12	22.06	25.8
Bulstrad Vienna Insurance Group AD	11.14	15.10	15.96	17.03	17.55	20.41	24.87	30.29	23.58
Uniqa Life Insurance AD	8.18	10.70	12.27	13.70	14.70	17.91	17.53	14.19	11.86
	Indicator	rs of cor	npetitior	n intensi	ty				
CR4, %	Indicator 58.46	rs of cor 58.16	npetitior 61.08	n intensi 69.32	ty 69.8	73.82	83.61	84.65	84.15
CR4, % Competitors, number	Indicator 58.46 17	rs of con 58.16 16	npetitior 61.08 16	n intensi 69.32 15	ty 69.8 13	73.82	83.61	84.65	84.15
CR4, % Competitors, number HHI, %	Indicator 58.46 17 1173.8	rs of con 58.16 16 1198.5	npetitior 61.08 16 1258.8	69.32 69.32 15 1499.0	ty 69.8 13 1534.5	73.82 13 1633.9	83.61 11 1860.0	84.65 11 2006.8	84.15 10 1978.73
CR4, % Competitors, number HHI, % ICSCMD	Indicator 58.46 17 1173.8	rs of con 58.16 16 1198.5 0.12	npetition 61.08 16 1258.8 0.08	69.32 15 1499.0 0.15	ty 69.8 13 1534.5 0.05	73.82 13 1633.9 0.09	83.61 11 1860.0 0.28	84.65 11 2006.8 0.11	84.15 10 1978.73 0.15

Source: Author's calculations based on data from FSC.

Despite its significant market share of insurance companies, the average market profitability is hesitant (Figure 4).

Main profitability indicators in the life insurance market in 2009-2020 period, average %



Source: Author's calculations based on data from FSC.

The net income from net premiums earned has been the highest for all of the years for the period (between 11.4% in 2012 and 8.2% in 2020), which indicates effectiveness in revenue management and compensation payoff. This can also be observed in the management of expenses due to the measures of a combined ratio of under 100% with a tendency of shortening the period. On the other hand, ROE has been shifting between the margins of 3.9% and 9%, which in combination with the even lower levels of ROA (between 0.9% and 2.6%) allows for findings of dependency of competitors from predominant equity and infectivity of the management of their assets. The development of the average market profitability signifies its low effectiveness.

The majority of the insurance penetration drivers (23 indicators) have a statistically significant but also a bigger than average (Spearman's rho ≥ 0.7)⁴ influence (Figure 5), which means that their selection is suitable. The papers of other authors, alongside the current one, point to a development in the state's wealth and productivity, income per capita, saving rate, life expectancy⁵, level of urbanisation of the population, as well as the dependency ratio, school enrollment and educational attainment, all of which increase the Bulgarian's desire to apply for life insurance. It's considered irrefutable that a person with a higher income and a better (self-fulfilling) job, living in urban conditions with a higher risk to one's life and a lower than expected life expectancy, with a tendency to save money and a desire to protect themselves as well as their dependent relatives, would have a higher affinity to life insurance products. Tertiary, gross enrolment, unlike the secondary one, plays a strong positive role in the Bulgarians' insurance interest. The study suggests that the bigger percentage of people over 25 who have acquired a bachelor's degree of education or its equivalent, has a significant statistical impact on the desire for life insurance. This, in spite of the number of secondary and higher education graduates decreasing every year and its negative influence, supports the conclusion related to the greater awareness of the better-educated population in regards to the insurance service (Peeva, 2020). A problematic aspect for Bulgaria is more likely to be the size rather than the direction or power of influence of these factors.

Even though the income per capita has grown by 88.46% in the last 12 years, and the wealth by 74.17%, both indicators remain significantly lower than the average European's. A single Bulgarian's productivity levels are over 3 times lower than the average European's while his/her income is about 6 times lesser. In practice, in spite of the positive significance of the increase of two of the most important economic indicators of insurance penetration in Bulgaria, their absolute size is insufficient to instigate a strong demand for insurances. This problem is made worse by the current pandemic due to the high risk of unemployment and income insecurity which will, in fact, cause an outflow of revenue on the market, despite the benefits of the protective element of life insurances.

⁴ The force of influence is evaluated according to (Cohen, 1988).

⁵ The life expectancy of a Bulgarian individual is 74 which ranks the country second to last on this indicator in the EU right before Romania. Even the small growth of life expectancy has a higher than typical statistically significant impact on life insurance penetration and hence attests to the value of the features of the protective mechanisms of insurances.

Figure 3





** Correlation is significant at the 0.01 level (2-tailed); *Correlation is significant at the 0.05 level (2-tailed). Source: Author's calculations based on data from FSC, NSI, BNB, WB. In conflict with the studies conducted in other states, Bulgarians are characterised by a different brand of logic than the norm in factors of demand such as: distribution of income, inflation, real interest rates and social insurances. The inequality of incomes in Bulgaria, unlike in other countries, has a statistically significant positive effect on life insurance product penetration. With the rise of the Gini index up to 40% in 2019, life insurance penetration increases, which could be explained by the insurance interest of the richer part of the population and vice versa, the negative attitudes of the middle class towards the offered services. As it is in other papers, inflation impacts demand negatively, however, the connection is not statistically significant due to the relatively healthy levels it has, during some years, it's even negative for the period. Real interest rates negatively affect insurance penetration since when they rise, consumers redirect their savings towards more favourable short term plan investments. At the same time, even if the advantages of the offered products are known, the lack of sufficient income (especially among school and university students) and the lack of trust in insurance companies prove to be more significant factors for demand.

It is reasonable to suppose that the increase in social insurances will lead to a decrease in the need for life insurance as a savings instrument for the elderly. However, in Bulgaria, their impact is strong and statistically significant proportionately correlated. The rationale of this dependency is found in two points: a protective function of the insurance service that is absent during the pension and the setup of the pension system in Bulgaria. The latter is based on the principle of solidarity between the generations (the pay-as-you-go system), which practically means that the current workforce pays out the retirement funds of the pensioners via its social tax rate at the same moment of time. Even though adding the other two pillars supplementary mandatory insurance and supplementary voluntary pension insurance, which make use of the opportunities of the capitalist market to accumulate pension capital, their payout is associated with significant difficulties. The size of pensions is inadequately juxtaposed to the necessity to maintain a normal living standard (Christoff, 2019)⁶ and if they wish to preserve their financial independence, Bulgarians are to save and invest independently outside of mandatory pension insurance. This suggests that life insurances are a product that adds to the pension system and with the rise of social insurances, their demand grows too. Consumers are searching for the benefits from the investment of their meagre funds, as the surge in life insurances and inequality of income would prompt insurance interest to a higher degree than education and high-interest percentages.

A competitive environment has a contradictory impact on insurance penetration. The increase in the concentration of the market and the processes of merging and injecting firms have a strong, statistically favourable influence, however, the decrease in the number of competitors does the opposite, it slows down penetration. In practice, this results in the force, image and scale of strategies of the big insurers to be accompanied by the presence of many smaller players around them and creates an imbalance in market distribution to generate an interest and popularise the service. Logically speaking, the growth of the premium revenue of companies leads to a higher significance and preference of the business, yet the levels of profitability and, in this regard, the effectiveness of the market itself do not have a statistically significant impact over the generation of added value from insurance activity which is

⁶ The pension is considered to be at least 75% of the gross monthly earnings of the person, prior to retirement. (Ellis, Munnell, Eschtruth, 2014).

probably because of their instability and their overall low levels. The low profitability of the market is owed to insufficiently effective strategic decisions of the enterprises and the small number of competitors who offer the service.

To become centres of security and a healthy way of life, which is done through digital applications and a constant contact and feedback from the population so that insurance interest can be provoked, insurance companies have to deploy large scale activity via propaganda of the benefits of life insurance and a change in consumer attitudes towards it can happen. Most firms should take responsibility for and financially guarantee the realisation of the market's potential. Their offers are to be: (i) personalised by having them focus on maintaining and stimulating a healthy way of life; (ii) transparency and access to information to every single insurance contract and its change in dependence to people's individual needs at any time and any place (omni-channelling of demand); (iii) a supply of life insurances as an addition to related and unrelated goods and services (hybrid products); (iiii) an increase in financial literacy and direct and indirect tax incentive.

Surveys of consumer attitudes regarding life insurance in Bulgaria demonstrate that the main reasons for rejection of life insurance are the lack of trust towards insurance companies, the current lack of interest, or the low income, such as the misunderstanding of the benefits of the service offered and the mentality of the consumers repeating the "nothing is going to happen to me" mantra, add to the scepticism of consumer demand and behaviour (Peeva, 2020; Hristova, Peeva, 2018). As a result of distrust, Bulgarians prioritise investments in: real estate, Collective Investment Schemes and Alternative investments funds or bank deposits. The last investment type is a long time priority for the allocation of excessive funds and their value is 66 times higher than the premiums written of the entire life insurance market. The future of this alternative is unsure due to the nil interest rates throughout the last two years and a rejection from 2 Bulgarian banks from offering such type of products. This will lead to a forceful allocation of resources into the capital and real estate markets, and most probably the life insurance one. In view of the current model of investment behaviour that Bulgarians have, life insurance is not a trade-off choice, rather, it's an eventual addition to a comprehensive investment portfolio. The Bulgarian consumers' mentality has still not shifted to new investment opportunities, which have become a long-time tradition in Western Europe. The Bulgarian individual has not enough financial literacy and, in some cases, lacks a sufficient income to diversify their financial portfolio and this problem is exacerbated due to the pandemic. The bigger the willingness of the Bulgarian towards saving and expanding investment horizon, the better they will be capable of acquainting themselves with the positives and negatives of every alternative and manage to acquire a mentality directed towards protecting one's life, health and senior years. Competition of life insurance companies via offering more attractive products and the kind that are tailored to deal with COVID-19 risks specifically, more flexible channels and their distribution, not only the key one - personal meetings (Sharma, Patterson, 1999; Hatzakis, Nair, Pinedo, 2010) and with a bigger focus on the individual needs of the Bulgarian consumer, becomes a key factor of penetration.

5. Conclusion

The study of life insurance penetration indicates that Bulgarians tend to increase their willingness to apply for life insurance, however, they still remain significantly below the indicators typical for other EU states (H1 and H2). The global pandemic is having a negative impact on life insurance premiums in Bulgaria, but it is also an opportunity to shape them as a product specifically structured to protect people's lives and health (H₃). Results are synchronised for a number of studies, the developing economy of Bulgaria not having been significantly affected by life insurance activity, while the benefits from the well-developed life insurance market remain invisible and unappreciated by consumers. Factors such as income, savings, urbanisation, dependency ratio, life expectancy and education, have a definite positive impact on the level of life insurance demand, while other interest rates, unevenness in income distribution, social contributions, have an ambiguous significance. This proves the H₅ hypothesis. Determinants of market competition whose influence is less well studied, signify that it stands out with a concentration and a traditionally small amount of relatively big and well-known competitors that is, however insufficient to deploy a large scale and effective activity by building up the image of life insurance as a good way to protect the health, transference of risk, investment in retirement and expanding on the benefits from life insurance to develop the country's economy (H_4) .

Due to their culture and traditionally conservative views, a big part of Bulgarians prefers to allocate their relatively low excess income into more visible and established assets such as deposits or real estate, while life insurance as a financial service with its derivative features is assessed sceptically considering its preventative use and may be viewed as only an addition but not as a replacement of investment preferences. The future of life insurance companies can be seen in serving the interest of turning the customer purchase into an experience for the modern generations of consumers via offer personalisation, omni-channels and the digital connection of data and devices. All that will lead to a more complex and permanent communication with users and with efforts focused on customers' needs, transparent conditions, awareness and trust. On the other hand, Bulgaria, despite its attempts at stimulating the processes in an online environment in response to the pandemic, is in the last -28 place in the take-up of digital technologies in the economy and society (DESI=36.4), which along with the insecurity of income during COVID-19 suppresses the attempts at improving insurance penetration. If the impact of the pandemic on the market in other countries sets up an expectation for a short-term outflow of funds (Harris, Yelowitz, Courtemanche, 2021), then in Bulgaria, the insurance interest is yet to be established on a sufficient level. To prove its worth on the Bulgarian market, life insurance would have to reimagine itself as a modern trend of prevention of a healthy way of life with a long-term savings component that, by applying the snowball method, is to cover a broader range of persons and with that to ensure an improvement of consumer attitudes and to increase insurance penetration.

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Volume 31(6), 2022

PROPENSITY OF YOUTH TO MIGRATE: EVIDENCE FROM KOSOVO³

This paper investigates the propensity of youth to migrate using the survey data from two universities in Kosovo. The logit model results suggest comprehensive and statistically robust evidence that migration propensity is negatively related to age. The respondents that have political concerns, that are against or indifferent to migration as a phenomenon, compared to those that support it, have indicated statistically significant negative migration propensity. Conversely, the data suggest that economic, cultural, and security variables are significantly and positively related to migration propensity. Moreover, the data suggests no statistically significant impact of gender, marital status, residence, employment, income, relatives' network, religion, and training, variables, on the migration propensity. The robustness of estimated results is supported by diagnostic tests. Finally, the fact that 59% of respondents have indicated a propensity to migrate, clearly emphasizes the seriousness of the migration challenge, and the consequential impact it may have on the future prosperity of the country. Keywords: migration; youth; propensity; logit JEL: F22; J61; O15

1. Introduction

The review of literature lists many factors of migration, and it encapsulates them into the push-pull factors of migration. In general, these can be further classified into economic, social, and political factors (European Commission, 2000; World Economic Forum, 2017; European Asylum Support Office, 2016). Presently, a combination of chronic political, economic, cultural, and security concerns, accompanied by a bleak future for overall prosperity in Kosovo, and high unemployment rates among Kosovo youth, have resulted in 59% of sample respondents expressing their willingness to migrate, as the data from this study indicates. The percentage of unemployed youth in the total unemployment is 34.7% (Kosovo Agency of Statistics, 2020). Ironically, the worrying migration trends in Kosovo, accompanied by fragile democratic governance, weak rule of law and corrupt economic governance, regardless of it being intentional or unintentional, have neither been understood as a real problem by most Kosovo politicians, nor by the past governments. Rather, outward

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³ This paper should be cited as: *Beqiri, T., Hoxha, A. (2022). Propensity of Youth to Migrate: Evidence from Kosovo. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 120-132.*

migration has been unequivocally accepted as an ameliorating solution to the lack of overall prosperity and as an efficient instrument of reducing the high unemployment rate (estimated at 29% by the Kosovo Agency of Statistics, 2020).

In this paper, we will employ the logit model to examine the relationship between willingness to migrate, as the dependent variable, against age, gender, marital status, residence, employment, income, relatives abroad, migration reasons, migration perception, migration perspective, and training, as independent variables. The subsequent sections will include, *first*, a literature review of the migration determinants; *second*, s review of the main empirical findings, *third*, a review of applied econometric models; *fourth*, a description of data; *fifth*, logit regression analysis; and *sixth*, a summary of the main findings of the paper.

2. Literature Review

This section provides a brief literature review on the determinants of migration, such as the relationship of migration with GDP, income, unemployment differentials, migration motives, socio-economic determinants, geographic and cultural differences, policy issues, violation and abuse of human rights, exploitation, discrimination, free movement, education, and labour motives, distress migration, gender norms, life course transitions, and human security perspective.

Mintchev, Boshnakov, Richter & Ruspini (2017) have examined the importance of the reasons and the way migrants decide to leave the country for shorter or longer periods. They argue that the questions related to the determinants of migration and the type of migration are strongly related, because different types of migration may be contingent on different determinants. In solving the reasons why individuals migrate, they provide a comprehensive literature review of the functionalist and structuralist theories. They suggest that functionalist approaches attempt to rationalize migration as a function of market processes. In contrast, historical-structuralist theories state that international migration is triggered by the unequal political and economic distribution of power in the world economy. Blanchflower, Saleheen & Shadforth (2007) have found evidence of faster population growth in the UK due to migration from the Eastern European Countries (EEC), owing to higher GDP per capita in the UK. Second, they have observed that many of the new 'migrants' have stayed for only a short time and then returned home, to possibly return later. Third, they have found evidence that individuals from the EEC were relatively young, male, had low unemployment rates, lower wages, and high self-employment rates, and were especially likely to be in temporary jobs. Finally, they have argued that this immigration has made the labour market more flexible and may have lowered the Non-accelerating Inflation Rate of Unemployment (NAIRU).

In contrast, Chiang, Hannum & Kao (2013) have investigated the individual and altruistic economic motivations that are included in the demographic and economic research. Specifically, they have examined the role and importance of the non-economic goals of personal development, a motivation suggested in numerous qualitative studies of women migrants in China and elsewhere. Furthermore, Sprenger (2013) has empirically investigated the determinants of migration between 21 developed countries, members of the EU, and the

OECD. By using the data on migration flows over the period 2000 to 2009, he has examined the impact of traditional economic variables such as income, unemployment differentials, and geographical and demographic factors. Moreover, he has examined the impact of cultural differences on the mobility patterns in the EU before and after the 2004 enlargement round.

In contrast, Piesse (2014) has examined the impact of socio-political, economic, and ecological factors on migration. In his view, the rising communal violence worldwide, often because of ethnic or religious intolerance, has led to increased levels of migration. Additionally, he suggests that economic disparity between developing and developed economies encourages the movement of skilled labour from the former to the latter. Moreover, the dynamics of the ecological environment have the potential to worsen food and water insecurity in various parts of the globe. Hence, the limited access to food and water resources may push people to migrate to countries where these resources are more readily available. The UNICEF (2014) study has found that labour migration push-pull factors are intensifying. Specifically, the high unemployment and absence of decent work opportunities, among other factors, push youth to migrate. The pull of demand for labour and skills mobility is permanent, structural, and growing, driven by technological changes, evolving markets, and spreading demographic transitions. Moreover, the study has found that up to 50% of migration flows comprise youth between ages 18 and 29.

On the other hand, Heckert (2015) has investigated internal migration among the Haitian youth, aged 10–24. The study has compared the characteristics of youth who migrate with education and labour motives and has determined the characteristics associated with family financial support to youth migrants. In comparison, Deotti & Estruch (2016) have examined migration as a common livelihood strategy for households across sub-Saharan Africa and North Africa. The study found that despite structural differences, these two regions have faced major migration and youth employment challenges. They have developed a conceptual framework to simultaneously address the root causes of distress migration of rural youth and leverage the potential of migration to reduce rural poverty and improve food security, with the overall objective of contributing to agriculture and rural development in migrants' areas of origin and migration-prone regions.

Similarly, Anderson, Apland, Dunaiski & Yarrow (2017) have explored the experiences of young people that migrate internally in Vietnam and the Philippines. They have investigated how gender hierarchies and gender norms influence the decision-making and experiences of youth migration. In contrast, Gavonel (2017) has investigated the relationship between life-course transitions to adulthood with the patterns and predictors of internal migration in low-income and middle-income countries. He has documented the patterns of prevalence, frequency, timing, reasons and streams of migration, employment at the destination, subjective well-being, and migration aspirations, with special emphasis on the factors associated with young men and women's decision to migrate, and the reasons for migrating. Moreover, Giménez-Gómez, Walleand & Zergawu (2017) have argued that to better understand the present migration and refugee crisis in Europe, it is necessary to understand the different migration from a broader human security perspective and have analyzed the determinants of regular and irregular migration flows from Africa to Europe for the period 1990 to 2014.

3. Review of empirical findings

According to Elbadawy (2011), one in three young men in Egypt in the age group 15-29 has expressed the willingness/intention to migrate. He finds that having a migrant on one's social network is one of the key factors in developing migration aspirations. The wealthiest youth are more likely to want to migrate to the West. Conversely, the analysis of Chiang et al. (2013) indicates that the desire for personal development is a common motivator for young migrants. Additionally, their results suggest that non-economic incentives may play an important role in youth migration in rural China and that positioning in family structures shapes the predisposition of individuals to migrate due to altruistic economic motivations.

In contrast, Herrera & Sahn (2013) have found that determinants of youth migration are heterogeneous by gender and destination. The higher the fathers' education, the more (less) likely are their daughters to move to urban (rural) areas. Next, they have found that young men and women, who spend their childhood in better-off households, are more likely to move to urban areas. Also, the presence of younger siblings increases the propensity of moving to rural areas. Access to primary schools during childhood decreases the likelihood of migrating to urban areas for both men and women. Conversely, Sprenger (2013) has presented an empirical study of migration flows between 21 EU Member States that are also OECD members over the period 1998 to 2010. His results indicate that economic factors are significant in analyzing migration flows. Furthermore, he found robust evidence that variables such as language, cultural proximity, and migrant network have a significant impact on migration flows. Additionally, the free movement of workers has a significant positive effect on migration.

According to Heckert (2015), both education and labour migration becomes more common with increasing age. Education migration is more common among youth born outside the capital and those first enrolled in school on time. Labour migration differs little by region of birth and is associated with late school enrollment. Moreover, rather than sending remittances home, many youth migrants continue to receive financial support from their parents. Provision of financial support to youth migrants is associated with current school enrollment. Female youth are more likely to be migrants, and less commonly receive support from their household of origin. On the other side, Deotti & Estruch (2016) suggest that migration decisions are driven by a variety of root causes (i.e. poverty, food insecurity, inequality, poor income-generating opportunities, and increased competition for scarce land and water resources). They are strongly context-specific and depend on the individual and household characteristics. The root causes of distress migration of rural youth, its impacts on the agriculture and rural development of the areas of origin, as well as its patterns differ according to the context. Furthermore, they argue that migration can have both positive and negative impacts in the rural areas of origin.

Additionally, the research of Anderson *et al.* (2017) implies that norms and expectations relating to gender influence young people's decisions to migrate and their experiences as internal migrants. Gender norms and dynamics shape the opportunities that are available to young men and women, determine the demand for their labour, compel or proscribe their migration, and inform (perceptions) of their vulnerability. Only through an understanding of the risks and opportunities that accompany youth economic migration through a gender

perspective, can policy and programming effectively address risk and better empower young migrants. Also, Eshetu & Beshir (2017) suggest that 76.2% of the migrants left their homes at age ranges between 15 and 25 years. Similarly, they have found that 48% of the migrants were attending junior education level, while 28% and 13% of the migrants were attending secondary and primary education levels, respectively. Moreover, 80% of migrants were not married at the time of their migration. In addition, their study has found that the main reasons for rural-urban migration in the study areas were better jobs opportunities in the urban areas (44%), rural poverty (26%), search for further education (10%), starting a new business (8%), to be free from restrictive culture (8%) and better urban services (4%).

Furthermore, Mintchev et al. 2017 results suggest that other things equal, men, younger individuals, and persons without family commitments express higher migration propensity. Furthermore, migration is motivated to a great degree by education. Their results suggest that Bulgarians from all income ranges aspire to migrate, whereas they find no relationship between migration aspirations and certain income strata. Importantly, the occupation status, specifically students, unemployed, and individuals employed in agriculture, have a higher migration propensity, both long-term and short-term. Conversely, individuals working in the public sector exhibit a lower propensity to migrate, mainly due to the stability and security of such positions. Significantly, their data suggests that the individuals that migrate once, may migrate again, i.e. engage in circular migration, or may effectively permanently settle in the migrating country. Finally, they find that younger, unemployed, temporary workers, and individuals with better education show a higher propensity to re-migrate. Comparatively, Mintchev & Boshnakov (2018) analysis suggests that individuals of older age, with higher educational levels, employed, with higher living standards, exhibit greater willingness to stay. Likewise, married individuals, combined with those who have achieved their migration goals, are more likely to engage in temporary migration. In contrast, the individuals that are not married, that have not achieved their migration goals, or with longer stay outside the country are more likely to leave the country forever.

In contrast, Gavonel (2017) suggests that there is a significant share of migrants between 15 and 19 years old, and they are very likely to move more than once. In all countries, the migrants are more likely to move after the school-age years, between ages 17 and 18. These patterns in frequency and timing of moves provide new evidence that young individuals migrate very often, even before having finished school, which is key to understanding educational performance. They provide evidence that young people move for a variety of reasons that go beyond the economic-related reasons. Family formation and family reunion are also important motives for migrating, especially in the studied age range. The migration streams presented show that these youth do not necessarily follow rural-urban migration as it is generalized in the literature, and they shed light on the dynamics of the less studied ruralrural migration. Their results suggest that at this age, migration is a household strategy; although the migrants do not necessarily contribute remittances to their previous household, they are often receiving them from their caregiver. Furthermore, the results of Giménez-Gómez et al. (2017) indicate that a combination of push and pull factors influence the migration decisions of individuals. Particularly, rising political persecution, ethnic cleansing, human rights violations, political instability, and civil conflicts in African source countries are all significantly associated with increased migration flows into European destination countries. Therefore, their findings underscore the need for the EU and European countries to collaborate with the source countries, not only in terms of supporting economic development in the source countries, but also in promoting human security: human rights, democracy, peace, and social stability.

4. Applied Econometric Models

This section provides a brief review of methodological issues. First, Chiang et al. (2013), have investigated the incentives for labour migration of youth in rural China, using panel data from the Gansu Survey of Children and Families, a longitudinal study of youth in rural Gansu Province of China. In contrast, Herrera & Sahn (2013) have utilized a sample of 2,676 individuals, aged 21 to 35 years, where 35% were internal migrants, and over half were defined as temporary migrants. Utilizing multinomial logit models, they have estimated the role of early childhood household and community characteristics in young people's decision to migrate. Comparatively, Heckert (2015) has employed the data from the 2009 Haiti Youth Survey. Specifically, the study has applied discrete-time event history analysis to model characteristics associated with education and labour migration, as well as a two-stage Heckman probit model to determine the characteristics associated with family financial support for two different samples of youth migrants. Similarly, Mintchev et al. (2017) have applied logistic regression analysis to examine the impact of different variables, obtain additional information, and contrast the outcomes provided by the survey instruments, to enhance the understanding of social inequalities, regional disparities, and migration policy determinants.

Conversely, Anderson et al. (2017) have applied a primarily qualitative research design to explore the topics of gender, youth, and migration in an in-depth and contextualized manner. Additionally, they have analyzed existing (secondary) quantitative data to examine the patterns of internal economic migration in Vietnam and the Philippines. Moreover, Eshetu & Beshir (2017) have employed a probit regression model to show that age, years of schooling, relatives in receiving areas, monthly income in sending areas, and family size, have a statistically significant impact on the rural-urban migration. In addition, Gavonel (2017) has used a panel dataset on youth born in 1994-95 in Ethiopia, India, Peru, and Vietnam, to investigate the impact of the life-course transitions to adulthood on the patterns and predictors of internal migration in low-income and middle-income countries. Furthermore, Mintchev & Boshnakov (2018) have employed a binary logistic regression to investigate the choice of Bulgarian migrants on whether to stay or re-migrate and to analyze the impact of the specific factors that help explain the development of incentives for the Bulgarian migrants to migrate. Correspondingly, Wondimagegnhu & Zeleke (2017) have utilized a stratified sampling technique to select a total of 200 household heads in three agro-ecologies of the study area. They have used structured questionnaires as a principal primary data collection method and logistic regression to perform the analysis. Next, we turn to the description of the data and dataset.

5. Data and Variables

The survey was conducted with students at the University of Prishtina (UP) and University of Peja (UPE), both located in Kosovo, during April and May 2018. Specifically, the sample has 500 observations, 300 from UP and 200 from UPE. The following questions were asked to the students: 1. Do you think to migrate after completion of your education (1 = yes; 2 =no). 2. Age (in years). 3. Gender, (1 = female; 2 = male). 4. Marital status, (1 = not married; 2 = male)2 = married). 5. Where is your residence, (1 = village; 2 = city). 6. Employment status, (1 = yes; 2 = no). 7. Monthly family income in euros, whereas the income ranges are: 1 = (0 to)500); 2 = (501 to 1000); 3 = (1001 to 2000); and 4 = (greater than 2000). 8. Do you have any relative that has migrated abroad (1 = yes, 2 = no). 9. For what reasons would you migrate (multiple selection question: political, (1 = yes, 2 = no); economic, (1 = yes, 2 = no); religious, (1 = yes, 2 = no); cultural, (1 = yes, 2 = no); and security, (1 = yes, 2 = no)). 10. How do you perceive migration (single selection question: 1 = risk; 2 = opportunity; 3 = both risk &opportunity). 11. Do you think that migration should be prevented, (single selection question: 1 = it should be stopped; 2 = it should be encouraged; 3 = it is not relevant). 12. Have you followed any well-organized and well-structured program from any agency/organization that deals with migration issues (1 = yes; 2 = no).

Questions 2 to 12 represent the independent variables. Note that for practicality, the numbering of independent variables, X's, has started from 2, i.e., X2, X3, ..., X12, to match the number of independent variables and their respective coefficients with the number of questions described above. The income variable has been utilized as a scale variable, $X7_i$, and as an ordinal variable (X7Ai, X7Bi, X7Ci, and X7Di). Note, that the coefficient of X7Ai is not estimated since it is used as a benchmark for other income ranges. Additionally, question 9 is a multiple selection question, where the respondents were required to identify one or more correct answers in a list of possible answers. For example, respondents were allowed to select political, economic, and cultural reasons, if applicable to them. However, for the purpose of estimating logit model regressions, these responses, i.e., sub-questions, have been expressed with separate variables. Specifically, political reasons with X9A_i, economic reasons with X9B_i, religious with X9C_i, cultural with X9D_i, and security reasons with X9E_i. On the contrary, questions 10 and 11 are single selection questions, where respondents were asked to pick only one answer from a predetermined set of responses with three options each. For example, the perception of migration in question 10 as an opportunity is represented with X10A_i, as risk with X10B_i, and as both risk and opportunity with X10C_i. Likewise, the perspective on migration in question 10 that it should be stopped is represented with X11A_i, it should be encouraged with X11B_i, and it is not relevant with X11C_i. Note, that coefficients of variables X10A_i and X11A_i, are not estimated since these values are used as the respective benchmarks.

6. Results

The logit regressions have been run by fitting all the variables in the model; however, the estimated test statistics have indicated that several of the independent variables do not have

a statistically significant relationship with the dependent variable. The fully unrestricted model, using income as a scale variable, is written as,

$$\begin{split} L_{i} &= LN \big[P_{i} / (1 - P_{i)} \big] = \alpha_{1} + \alpha_{2} X 2_{i} + \alpha_{3} X 3_{i} + \alpha_{4} X 4_{i} + \alpha_{5} X 5_{i} + \alpha_{6} X 6_{i} + \alpha_{7} X 7_{i} + \\ \alpha_{8} X 8_{i} + \alpha_{9}^{A} X 9 A_{i} + \alpha_{9}^{B} X 9 B_{i} + \alpha_{9}^{C} X 9 C_{i} + \alpha_{9}^{D} X 9 D_{i} + \alpha_{9}^{E} X 9 E_{i} + \alpha_{10}^{B} X 10 B_{i} + \\ \alpha_{10}^{C} X 10 C_{i} + \alpha_{11}^{B} X 11 B_{i} + \alpha_{11}^{C} X 11 C_{i} + \alpha_{12} X 1 2_{i} + u_{i} \end{split}$$
(1)

Table 1

Variable	Coefficient	Model 1	Model 2	Model 3	Model 4
	(2)	(3)	(4)	(5)	(6)
constant	(2) (1)	**1 637		**1 588	(0) n/a
Constant	α <u>1</u>	(0.043)	il/ u	(0.050)	in u
$X2_i$ - age	αa	**-0.077	-0.011	**-0.076	-0.012
		(0.034)	(0.474)	(0.036)	(0.424)
X3: - gender	α ₂	0.115	0.115	0.115	0.112
-1 8		(0.569)	(0.568)	(0.570)	(0.578)
X4 _i - marital	α	0.164	0.000	0.167	0.008
-		(0.695)	(1.000)	(0.690)	(0.985)
X5 _i - residence	α5	-0.039	-0.008	-0.038	-0.011
•	5	(0.835)	(0.965)	(0.840)	(0.954)
X6 _i - employment	α ₆	0.202	*0.387	0.209	*0.389
		(0.417)	(0.093)	(0.404)	(0.092)
X7 _i - income	α ₇	0.000	0.000	n/a	n/a
		(0.486)	(0.707)		
X7A _i - €0-500	α_7^A	n/a	n/a		
				(0.000)	(0.000)
X7B _i - €501-1000	$\alpha_7^{\rm B}$	n/a	n/a	-0.056	-0.018
				(0.809)	(0.937)
X7C _i - €1001-2000	$\alpha_7^{\rm C}$	n/a	n/a	-0.104	0.003
				(0.799)	(0.995)
X7D _i - >€2,000	$\alpha_7^{\rm B}$	n/a	n/a	-0.048	-0.005
				(0.959)	(0.995)
X8 _i - relatives	α ₈	0 6	0.299	0.207	0.299
		(0.369)	(0.178)	(0.366)	(0.179)
Omnibus Test	Chi-square	7.07	***19.09	6.69	**18.96
	p value	(0.422)	(0.008)	(0.669)	(0.026)
Model Summary	-2 Log-likel.	**669.79	**674.05	**670.17	**674.19
Cox & Snell R ²	p value	(0.014)	(0.037)	(0.013)	(0.037)
Nagelkerke R ²	p value	(0.019)	(0.050)	(0.018)	(0.050)
Hosmer & Lemeshow Test	Chi-square	7.61	*13.81	11.24	9.88
riosmer & Lemesnow Test	n value	(0.472)	(0.087)	(0.188)	(0.274)

Logit model estimated coefficients using age, gender, marital status, residence, employment, income, income-group, and relatives variables

Note 1: *** – significant at 1 percent l.s., ** – at 5 percent l.s., * – at 10 percent l.s. For example, equation in column 5 is: $L_i = \text{LN}[P_i/(1 - P_i)] = \alpha_1 + \alpha_2 X2_i + \alpha_3 X3_i + \alpha_4 X4_i + \alpha_5 X5_i + \alpha_6 X6_i + \alpha_7^B X7B_i + \alpha_7^C X7C_i + \alpha_7^D X7D_i + \alpha_8 X8_i + u_i.$

In contrast, the fully unrestricted model that uses income as an ordinal variable is written as,

$$\begin{split} L_{i} &= LN \big[P_{i} / (1 - P_{i)} \big] = \alpha_{1} + \alpha_{2} X 2_{i} + \alpha_{3} X 3_{i} + \alpha_{4} X 4_{i} + \alpha_{5} X 5_{i} + \alpha_{6} X 6_{i} + \alpha_{7}^{B} X 7 B_{i} + \alpha_{7}^{C} X 7 C_{i} + \alpha_{7}^{D} X 7 D_{i} + \alpha_{8} X 8_{i} + \alpha_{9}^{A} X 9 A_{i} + \alpha_{9}^{B} X 9 B_{i} + \alpha_{9}^{C} X 9 C_{i} + \alpha_{9}^{D} X 9 D_{i} + \alpha_{9}^{E} X 9 E_{i} + \alpha_{10}^{B} X 10 B_{i} + \alpha_{10}^{C} X 10 C_{i} + \alpha_{11}^{B} X 11 B_{i} + \alpha_{11}^{C} X 11 C_{i} + \alpha_{12} X 1 2_{i} + u_{i} \end{split}$$

Nevertheless, by employing the sequential elimination of regressors procedure, the variables have been eliminated sequentially by relying on the statistical significance of their estimated coefficients, i.e., their respective test statistics and p values. Hence, it can be argued that no statistically significant information is lost by omitting those variables from the model. The regression results, fitting migration as the dependent variable, whereas age, gender, marital status, residence, employment, income, and relatives as independent variables have been presented in Table 1. The logit regression coefficients using income as a scale variable have been presented in columns 3 and 4, whereas the logit regression coefficients using income as an ordinal variable, have been presented in columns 5 and 6. Furthermore, in columns 4 and 6 we have restricted the intercept term, i.e., $\alpha_1 = 0$. The regression results suggest that we may not reject the hypothesis that the coefficient of age variable, α_2 , is statistically significant at a 5 percent level of significance (l.s.) in columns 3 and 5, while it is insignificant in columns 4 and 6. Specifically, if age increases by one year, on average and ceteris paribus, the log of odds of the willingness to migrate will decrease by 0.077 in column 3, respectively by 0.076 in column 5. In contrast, the coefficients of all other variables are statistically insignificant, with the exception of the employment coefficients, α_6 , in columns 4 and 6, though only at 10 percent l.s.

The regression diagnostics, respectively, the Omnibus Tests of Model Coefficients suggest that the overall fit of our model is good only in columns 4 and 6. This table reports the goodness-of-fit test showing a chi-square statistic of 19.09, respectively 18.96, with a significance level of p < 0.008, respectively 0.026. The p level of 0.008, or 0.026, informs us that the goodness-of-fit test can be taken seriously and that it provides evidence that we have a meaningful model. The Model Summary table presents additional information on the usefulness of these models. The row titled -2 Log-likelihood shows a value of 674.05, respectively 674.19, which is not good. Smaller values are the best, and such values can easily range into the hundreds. Thus, based on the evidence, one may not be satisfied with this test, as high values of this test do not add credence to these models. With regards to the Cox & Snell R Square and the Nagelkerke R Square tests, the test values of 0.037 and 0.050 for both columns 4 and 6, suggest that only 3.7%, respectively 5.0% of the variability in the dependent variable is explained by the independent variables. The Hosmer-Lemeshow Goodness of Fit Test is the best test available to evaluate the fit of the logistic regression model. For this test to provide evidence of a good fit, one needs to fail to reject the null hypothesis. Therefore, p values greater than 0.05 are desired. The results show a chi-square value of 13.81, respectively 9.88, with a significance level of 0.087, respectively 0.274. Namely, the model in column 4 does not satisfy, whereas the model in column 6 satisfies this criterion, (for a detailed discussion of the diagnostic tests, see Aldrich and Cunnigham, 2016).

Table 2

Logit model estimated coefficients using age, political, economic, religious, cultural, security, perception, perspective, and training variables

Variable	Coefficient	Model 1	Model 2	Model 3	Model 4
(1)	(2)	(3)	(4)	(5)	(6)
constant	α ₁	**-1.764	n/a	-1.709	n/a
	-	(0.221)		(0.236)	
X2 _i - age	α2	-0.056	****-0.086	-0.055	****-0.083
		(0.139)	(0.000)	(0.146)	(0.007)
X9A _i - political	α_9^A	**-1.052	**-1.084	**-1.044	**-1.077
		(0.022)	(0.018)	(0.023)	(0.019)
X9B _i - economic	α_9^B	***1.426	***1.358	***1.403	***1.340
		(0.000)	(0.000)	(0.000)	(0.000)
X9C _i - religious	α_9^C	-0.553	-0.524	-0.525	-0.499
		(0.722)	(0.727)	(0.731)	(0.736)
X9D _i - cultural	α_9^D	***1.541	***1.482	***1.536	***1.479
		(0.000)	(0.000)	(0.000)	(0.000)
X9E _i - security	α_9^E	***1.095	***1.038	***1.105	***1.047
	-	(0.001)	(0.001)	(0.001)	(0.001)
X10A _i - risk	α^{A}_{10}				
		(0.000)	(0.000)	(0.000)	(0.000)
X10B _i - opportunity	$\alpha^{\rm B}_{10}$	**2.822	1.758	**2.807	***1.765
		(0.017)	(0.006)	(0.018)	(0.006)
X10C _i - risk & opp.	α_{10}^{C}	*2.021	0.978	*2.009	0.987
		(0.088)	(0.134)	(0.091)	(0.130)
X11A _i - stopped	α^{A}_{11}				
		(0.000)	(0.000)	(0.000)	(0.000)
X11B _i - encouraged	$\alpha^{\rm B}_{11}$	***-1.775	***-1.829	****-1.789	****-1.840
		(0.000)	(0.000)	(0.000)	(0.000)
X11C _i – not relevant	α_{11}^{C}	*-0.432	*-0.467	**-0.461	**-0.492
		(0.088)	(0.063)	(0.065)	(0.048)
X12 _i - training	α ₁₂	0.226	0.181	n/a	n/a
		(0.459)	(0.507)		
Omnibus Test	Chi-square	***158.41	***173.01	***157.86	***172.56
	p value	(0.000)	(0.000)	(0.000)	(0.000)
Model Summary	-2 Log-likel.	518.45	520.14	519.00	520.59
Cox & Snell R ²	p value	(0.272)	(0.292)	(0.271)	(0.292)
Nagelkerke R ²	p value	(0.366)	(0.390)	(0.365)	(0.389)
Hosmer & Lemeshow Test	Chi-square	2.55	4.46	4.29	4.18
nosmer & Lemesnow Test	p value	(0.959)	(0.793)	(0.830)	(0.841)

Note 1: *** – significant at 1 percent l.s., ** – at 5 percent l.s., * – at 10 percent l.s. For example, equation in column 3 is: $L_i = \text{LN}[P_i/(1 - P_i)] = \alpha_1 + \alpha_2 X2_i + \alpha_9^A X9A_i + \alpha_9^B X9B_i + \alpha_9^C X9C_i + \alpha_9^D X9D_i + \alpha_5^E X9E_i + \alpha_{10}^B X10B_i + \alpha_{10}^C X10C_i + \alpha_{11}^B X11B_i + \alpha_{11}^C X11C_i + \alpha_{12} X12_i + u_i$. Similarly, equation in column 6, where $\alpha_1 = 0$ and $\alpha_{12} = 0$, is: $L_i = \text{LN}[P_i/(1 - P_i)] = \alpha_2 X2_i + \alpha_9^A X9A_i + \alpha_9^B X9B_i + \alpha_9^C X9C_i + \alpha_9^D X9D_i + \alpha_9^E X9E_i + \alpha_{10}^B X10B_i + \alpha_{10}^C X10C_i + \alpha_{11}^B X11B_i + \alpha_{11}^C X11C_i + u_i$.

Next, the focus turns on the relationship of the propensity to migrate, as the dependent variable, against political, economic, religious, cultural, security, perception of migration, perspective on migration, and participation in training, as independent variables. The logit regression results have been presented in Table 2. The intercept term in columns 4 and 6 has

been restricted to zero, i.e., $\alpha_1 = 0$. Furthermore, the coefficient of training variable in columns 5 and 6 has been restricted to zero, i.e., $\alpha_{12} = 0$, considering that it is highly statistically insignificant. The comprehensive evidence from the regression results suggests that age, political, economic, cultural, security, perception and perspective variables are highly statistically significant. Next, only the results of the logit model in column 6 will be interpreted, as it looks as the most parsimonious model based on the diagnostic tests. Specifically, the age coefficient, α_2 , is significant at 1 percent l.s., hence, it indicates that if age increases by one year, on average and ceteris paribus, the log of odds of the willingness to migrate will decrease by 0.083. If the respondents have political concerns, on average and ceteris paribus, the log of odds of the propensity to migrate will decrease by 1.077, and the regression coefficient is significant at 5 percent l.s. While this coefficient is statistically significant, the sign is not very plausible, thus it should be cautiously considered. Conversely, if the respondents have economic, cultural or security concerns, on average and ceteris paribus, the log of odds of the propensity to migrate will increase by 1.340, respectively by 1.479 and 1.047, while the respective regression coefficients are significant at 1 percent l.s. Furthermore, if the respondents perceive migration as an opportunity, on average and ceteris paribus, the log of odds of the propensity to migrate will increase by 1.765, compared to those that view it only as a risk, and the coefficient is highly significant at 1 percent l.s. Also, if the respondents perceive migration as both opportunity and risk, then, on average and ceteris paribus, the log of odds of the propensity to migrate increases 0.987, compared to those that view it only as a risk, however, the coefficient is not statistically significant at any meaningful l.s.

The regression diagnostics, respectively, and the Omnibus Tests of Model Coefficients, indicate that the overall fit of the model is good. This table reports the goodness-of-fit test showing a chi-square statistic of 172.56, with a significance level of p < 0.000. The p level of 0.000 informs that the goodness-of-fit test can be taken seriously and that it provides evidence that this is a meaningful model. The Model Summary table presents additional information on the usefulness of this model following the insertion of the independent variables. The column titled -2 Log likelihood shows that a value of 520.59 is good. Thus, one may be satisfied with this test, as relatively low values of this test add credence to the model. Moreover, the Cox & Snell R Square and the Nagelkerke R Square tests, provide additional evidence that model is valuable. The test values of 0.29 and 0.39 in column 6, suggest that 29.2%, respectively 39% of the variability in the dependent variable is explained by the fitted independent variables. The Hosmer-Lemeshow Goodness of Fit Test is the best test available to evaluate the fit of the logistic regression model. For this test to provide evidence of a good fit, one needs to fail to reject the null hypothesis. Therefore, the chi-square value of 4.18 with a significance level of 0.841 provides additional evidence that the model in column 6 is consistent in explaining the behaviour of the dependent variable as a function of independent variables. The subsequent section summarizes the main findings of this paper.

7. Conclusion

Undoubtedly the migration process is a consequence of several pull and push factors of migration that are often country or region specific and are contingent on the characteristics

of a certain country or region. As the review of literature has shown, the migration inducing factors can range from non-economic incentives such as desire for personal development, (Chiang et al., 2013), parent's education (Herrera & Sahn, 2013), economic factors, language, cultural proximity, migrant networks, free movement of workers (Sprenger, 2013), education, age and gender (Heckert, 2015; Mintchev & Boshnakov, 2018), poverty, food insecurity, inequality, poor income-generating opportunities and increased competition for scarce land and water resources (Deotti & Estruch, 2016), gender-related norms and expectations (Anderson et al., 2017), and rising political persecution, ethnic cleansing, human rights violations, political instability, and civil conflicts (Giménez-Gómez et al., 2017). In contrast, the most significant benefits for the high-income countries, as Blanchflower et al. (2007) have found in the case of the UK, are mostly of macroeconomic nature. Specifically, the immigration tends to increase the labour supply by more than it increases demand, thus aiding in suppressing inflationary pressures, and potentially reducing the natural rate of unemployment, and boosting economic growth.

The results of the logit models developed in this paper clearly suggest that gender, marital status, residence, employment (significant at 10 percent l.s.), income (both scale and ordinal measures), relatives' network, religious and training variables have no statistically significant impact on the propensity of youth migration in Kosovo. Conversely, age is negatively related to the migration propensity. Oddly, the respondents with political concerns have a negative propensity to migrate. Likewise, the respondents who think that migration should be stopped, and those that consider it an unimportant phenomenon exhibit a negative propensity to migrate. Importantly, the results suggest that respondents with economic, cultural, and security concerns have a statistically significant higher propensity to migrate, compared to the respondents without these concerns. The diagnostic tests suggest that the results are statistically robust. Finally, although this paper offers a modest contribution to the literature, perhaps the development of a survey in the future studies with more questions, larger sample size, cross-country data, and the addition of time dimension, through panel analysis, will certainly help in enhancing the understanding of the root causes of youth migration in countries like Kosovo, countries of Western Balkans, and other countries that face similar challenges.

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Volume 31(6), 2022

DIGITAL TRANSFORMATION PERSPECTIVES IN WAREHOUSING – INITIAL STEPS AND PROJECTIONS²

Warehousing is an essential part of any logistics system, and warehousing activities are seen as a source of competitiveness. In the context of current trends in digitalisation and digital transformation, the problems concerning the usage of information systems and technologies in warehousing are expected to be in focus. The objective of the research paper is to summarise the level of digital transformation in the field of warehousing in Bulgarian trade and manufacturing enterprises, and on that basis to define some common perspectives. The study is based on data collected from a survey focused on warehousing management. The current article defines several discussion areas such as digital transformation and smart warehousing, knowledge about warehousing management, and the importance of warehousing software and consulting market potential.

Keywords: warehousing; digital transformation; IoT; information systems and technologies; software

JEL: M15; M19; O31; O32

1. Introduction

Logistics systems are important for the movement of material flows in the supply chain. At present, while the complexity of consumption is growing and the competition is more intense than ever, the efficient management of these systems is becoming more important. Transport and warehousing systems are the foundation of logistics systems (Ballou, 1992). These subsystems form a significant part of the total logistics costs and their management is a challenge. One of the classical approaches to analysing a logistics system is to view it as a set of points at which material flows stop their movement and links are formed between them (Coyle, Bardi, Langley, 1992, p. 25). The set of points includes storage and processing places, and the set of links includes transport. Warehouses play an important role in the logistics system and cannot be presented with a single definition. They are defined as a vital link within today's supply chains (Richards, 2018, p. 27).

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² This paper should be cited as: *Dragomirov*, N. (2022). Digital Transformation Perspectives in Warehousing – Initial Steps and Projections. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 133-153.

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Commonly, warehousing covers processes from receiving material flows to their dispatch. This logistics activity is related to integrated management of information systems and technologies, storage areas and layout design, strategies and methods for order picking, as well as the use of storage systems and material handling machines (Dragomirov, 2020). To ensure proper management of these processes and materials, data and information management in the warehouses is essential. Warehousing is directly related to the information flows in the supply chain and is directly influenced by the degree of use of various information solutions.

Recent years are the time of Industry 4.0 and related sub-topics such as Logistics 4.0 and Warehousing 4.0; that is why the number of scientific publications is growing. Now we are witnessing the emergence of terms such as Logistics 4.0, which is defined as an obvious consequence and the next stage of Industry 4.0 (Sternad, Lerher, Gajsek, 2018). Defining Industry 4.0 is a complex question, but it is revolutionary, involving the use of technologies such as autonomous vehicles, robots, the Internet of Things (IoT) etc., as pointed out by Marr (2018) and the systems are more than interconnected; they communicate, analyse, and use the information to drive intelligent action in the physical world (Deloitte Insights, n.d.). Logistics 4.0 deals with modern technical and technological issues (Domański, 2019). There is also the appearance of Supply Chain 4.0 (Krykavskyy, Pokhylchenko, Hayvanovych, 2019) and warehousing sub-topic as Order picking 4.0 (Winkelhaus, Grosse, Morana, 2021). All of this is expected to be influenced by the tendencies for digitalisation and digital transformation. These digitalisation trends are a challenge for existing business models, processes and logic (Kersten, Blecker, Ringle, 2017, p. ix).

The topic of information problems of warehouses in logistics is central. The objective of this article is to present the current state and trends in the use of information systems and technologies in Bulgarian enterprises and to use that data to reveal some potential roadmap areas that could be applied to other systems. The structure of the article is as follows: (1) to reveal the role of information systems and technologies in warehousing and to clarify their meaning for the digital transformation of warehousing; (2) to develop a research methodology for defining the current state and practices of warehousing management; (3) to analyse received results and define problem areas; (4) to provide discussions and recommendations about following the global trends.

2. Role of Information Systems and Technologies in Warehousing

In scientific theory, there are several definitions of information systems, but they mostly gravitate around the understanding of Laudon (2013, p. 48) that they cover organisations, management, and technologies. These solutions seek synergies on the one hand in the use of information technology, providing the collection, processing, storage, and exchange of data and information, as well as software with the common goal of supporting the management of business processes. Information systems in logistics can be classified into separate groups based on the different phases of material flow movement – systems focused on supply, operations, distribution, and logistics activities – transport systems, warehousing, order processing, inventory management, etc. (Dragomirov, 2015). Based on this logic, the

information systems in warehousing are part of the information systems in logistics, and they can function both relatively independently and in conditions of interaction with other information systems in the organisation. Their role is to support warehousing processes, and for this purpose, various information technologies are used. In logistics theory and practice, there are different approaches to the management of warehousing systems, but according to the well-established classification of information systems in logistics, it is possible to conclude that the main alternatives for warehousing management are:

- Warehouse management systems WMS.
- Enterprise Resource Planning ERP.
- Other types of information systems focus on solving specific or micro warehousing problems.

The two main types of systems provide different approaches to warehousing process management. While ERP systems seek to cover the organisation's functional areas and synchronise their work, WMS systems enter the warehousing processes within the warehouse. WMS systems focus on the orders and interface with the ERP system (Son, Chang, Kim, 2015). That is why WMS could be a single solution or part of enterprise resource planning systems (Richards, 2014, p. 189).

ERP systems register the movement of material flows between the separate points in the logistics system. This type of system reflects the acceptance and removal of certain quantities of products in warehouses. Still, it does not cover the processes that take place in warehouse acceptance, preparation for storage, storage, preparation of orders, etc. WMS systems fill in these issues by covering warehousing processes in-depth – acceptance and incoming control, preparation for storage, picking (preparation of orders – collection of goods and completion of orders), packaging, labelling, shipping, and others. In this case, each employee is under the constant control of the WMS system, constantly receiving tasks from it (Bradford, 2015, p. 179). The choice of system is based on the specifics of material flows and the scale of the activity, followed by system maintenance and development. For ERP systems, it turns out that project management is the most often mentioned critical success factor (Barth, Koch, 2019). Regardless of the system type, it should evolve in scope and integration with other systems and technologies over time in the form of projects for an upgrade.

It should be noted that WMS systems have a direct connection with process efficiency. For example, for the critical indicator of accurate and correctly executed orders in the warehouse, it can be noted that better results of organisations using WMS are clearly visible (Partida, 2012). Another important point is the integration of the systems with the other information systems in the organisation. Such an extension of ERP systems modules' scope for order processing and warehouse process management, even in the production stage, is known (Sumner, 2013, pp. 99-101). In practice, different combinations of information system integration can occur (Tjoa et al., 2018, p. 86). These and many other forms of interaction of information systems and technologies indicate digitalisation and digital transformation. It is important to point out that digitalisation and digital transformation reflect effectiveness and efficiency in SCM (Boyanov, 2019). In logistics, the digitalisation process is related to and dependent on the digitisation of other processes (Demirova, 2019).

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WMS systems offer realisation and control of various special tasks in the part of picking strategies and picking methods. They could be applied only by the implementation of WMS and particularly interesting are the methods of paper picking, pick by a label, pick by voice, pick by light, using barcodes and radio frequency identification (RFID). For some of them the ERP systems do not offer such functionalities because it is not within their scope. Now the WMS systems have become more important for creating intelligent forms of management (Woźniakowski, Jalowiecki, Zmarzlowski, 2018). Nevertheless, the level of application of each method of picking orders indicates the nature and condition of the entire warehousing management; also, it is tightly related to the digitalisation and digital transformation problems.

Relevant technologies are an integral part of the information problems of the warehouses. The main types of warehousing information technologies are reduced, usually to those for automatic identification barcodes and RFID. Their logistics application cannot be random but should follow specific rules, such as those of GS1, which for many years work enabling identity and creating visibility in supply chains (GS1, 2020, p. 6). The degree of knowledge of different types of terms and definitions from the standards' fundamental formulations indicates the warehousing activity.

In the field of warehousing systems, the application of the two presented fundamental technologies for automatic identification is based on marking locations or units and using various approaches to identify these places. Depending on the degree of application of modern information systems and technologies, barcodes or RFID tags can be used to mark: Locations – pallet places in racking systems, ramps, storage areas, etc.; Units – pallet units, cassettes, containers, boxes, as well as separate layers of packaging, etc.; Moving units in the warehouse - personnel, material handling equipment, and individual parts, etc. Accordingly, the identifying (reading) devices can be used by both the employees and the warehouse machines, as well as their elements. Some authors propose that a smart warehouse environment is more complex, including shelves that are tracked by an RFID-based system (Zhou, Piramuthu, Chu, Chu, 2017). The topic of the development of smart warehousing systems is important because of the need to achieve higher efficiency of warehousing processes. It is very broad, and the content of such warehousing systems cannot be defined easily. Smart warehouses use different technologies such as automated guided vehicles, augmented reality, the IoT and robotics (van Geest, Tekinerdogan, Catal, 2021). The topic of intelligent storage systems is very wide. However, some of the leading technological solutions that are mentioned in the research practices are:

- Artificial intelligence (AI);
- Augmented reality (AR);
- Automated systems & Robots;
- Big data;
- Blockchain;
- The Internet of things (IoT);

- Real-Time Locating Systems (RTLS);
- Others.

The IoT is an important technology in logistics, which is mentioned in several research papers (Bigliardi, Casella, Bottani, 2021; van Geest et al., 2021; Weng Chun Tan, Manjit Singh Sidhu, Sharulhizam Mohamad Shah, 2021; Yang, Fu, Zhang, 2021). In short, the IoT is a collection of different enabling technologies, including RFID (Gubbi, Buyya, Marusic, Palaniswami, 2013), sensors, sensor networks and others. RFID is an important basic component (Mostafa, Hamdy, & Alawady, 2019), that is combined with other digital systems. RFID and IoT applications are important for localisation, tracking and positioning (Tejesh, Neeraja, 2018), which are essential for warehousing. In the field of logistics and supply chain management, some aspects of RFID and GS1 are revealed by Rejeb, Keogh, & Treiblmaier (2019).

Each of the mentioned modern technologies has its own characteristics, but due to the significant and fast development of each technology, there is relatively poor detailed knowledge about each one and this gap is a prerequisite for determining future intentions in warehousing systems management. The list of technologies can be expanded, for example, with the application of unmanned aerial vehicles in warehouses, which could lead to several advantages (Fernández-Caramés, Blanco-Novoa, Froiz-Míguez, Fraga-Lamas, 2019). Still, the more recognisable ones are included in the present study. AI, AR, automated systems, robots, big data analytics, blockchain and the IoT are the most relevant technologies for the next five years, as pointed out by Toy et al. (Toy, Gesing, Ward, Noronha, Bodenbenner, 2020). These results could be used to categorise the technologies as imminent and future applications.

The digital transformation as a term appeared firstly among business professionals and it was later studied by academics (Reis, Amorim, Melão, Cohen, Rodrigues, 2020) in their literature review on the digitalisation problems. Digital transformation is related to implementing digital capabilities to support business model transformations (Henriette, Feki, Boughzala, 2015). Technology is seen as an important driver for digital transformation for logistics and supply chain management, adding capabilities such as integration, visibility, real-time, decentralisation, automation and autonomy management (Junge, 2019). The usage of different types of information solutions (technologies and systems) can also be used as an indicator of the maturity level of Logistics 4.0. Data-driven services, big data (data capturing and usage), RFID, RTLS, and IT systems (ERP, WMS, cloud systems) are defined as Logistics 4.0 dimensions and they represent an area of evaluation (Facchini, Oleśków-Szłapka, Ranieri, Urbinati, 2019). It is important to note that high warehouse productivity is not only the result of technology; there are other factors. Studies have found that human and technological factors are interrelated in smart warehousing (Wanjari, 2020), which is a potential area for future research. Also, it could be mentioned that digital transformation is related to an economy's success, but there is a question about the cost in social terms (Borissova, 2021).

For the purpose of the research, we can summarise that for Logistics 4.0 and the appearance of Warehousing 4.0, digital transformation is very important, but a complex problem at the

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same time. It is not so easy to present a single definition, but it could be noted that the digital transformation of warehousing is closely related to the level of usage of a variety of information systems and digital technologies in warehousing processes. In the studied literature, no already built model was found that fits the purpose of the article, which is why the focus of this paper is only on the main aspects of the studied problems. Nevertheless, according to the used literature, the author's vision is that RFID and the IoT are imminent, and the other technologies vary in the specific case needs.

3. Methodology

The established conceptual model of the participants in the logistics processes of the economy (Dimitrov, 1999, 2013, p. 91) is the basis of several studies in the field of logistics and supply chain management in Bulgaria. Several groups of participants can be distinguished in it. Accordingly, logistics research can be focused on trade and manufacturing enterprises, logistics service providers, logistics technologies vendors, software and consulting companies, etc.

Trade and manufacturing enterprises are prominent participants in the logistics processes. The management of logistics activities has a strong impact on the management of warehousing systems. The group of manufacturing enterprises includes enterprises that are producing products for production purposes and that are targeting the end-users. The group of trade enterprises consists of both wholesalers and distributors, as well as retailers. For all types of enterprises, the prerequisite for the presence of a warehouse and management of warehousing processes is imposed/mandatory.

3.1. Research scope

The scope of the study includes Bulgarian trade and manufacturing enterprises in which warehousing is objectively performed. All types of company ownership and company size are included – small, medium and large enterprises. A necessary prerequisite for inclusion in the research is the existence of primary self-managed warehousing processes. Outsourcing is not included; also, logistics service providers are not covered by the study.

3.2. Data collection methods

For data collection, we used an electronic questionnaire form that was built using the opensource platform Limesurve. The questionnaire contains different question groups that cover problems concerning the management practices of the warehousing systems and following different trends in warehousing. In the survey, Likert scale questions are mainly used (1 -Strongly disagree, 2 – Somewhat disagree, 3 – Neither agree nor disagree, 4 – Somewhat agree, 5 – Strongly agree) for evaluation of the current situation and for the plans for the next three years. In addition, multiple-choice questions are used in the questionnaire. The collected data is exported directly in a file format that is supported by statistics software.

3.3. Research questions and data analyses

According to the literature review, digital transformation is related to the usage of different information systems and technologies. On that basis, the analyses are divided into two groups:

- Descriptive part evaluation of the current state.
- Finding patterns in the answers to understand the results in more details

This is the foundation on which guides and recommendations for a more successful digital transformation of warehousing are defined. The research problems and questions which have been covered in the study are separated into two main groups. The first one contains four sub-groups, while the second contains two sub-groups, as shown in Figure 1. The main hypothesis in the research is that the digital transformation perspectives for the warehousing processes are relatively good, but there are a group of factors influencing warehousing management to follow the modern trends.

Figure 1

A research framework for digital transformation perspectives in warehousing



Source: Author's illustration.

In general, the research question covered in the descriptive part of the article could be represented as:

- Level of usage of information systems and information technologies for automatic identification Main types of software for managing warehouse processes, functionalities of the systems, and application of technologies for automatic identification barcodes and RFID. The topic is expanded by including the information problems in the warehousing and evaluation of the market for software solutions for warehouse processes management.
- Level of usage of information solutions for order picking processes.
- Knowledge of GS1 Standards in the field of logistics and warehousing.
- Application of intelligent warehousing solutions the IoT, RTLS, AR, big data, blockchain technologies, warehousing robots, AI, automated control systems, etc.

Descriptive statistics include calculation means and standard deviation, multiple response analyses, grouping etc. Some hypothesis testing, such as independent samples tests are used.

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The other part of the research uses factor analysis methods to reveal patterns in the answers. This component analysis (PCA) is applied principally in order to reduce the dimensionality of a data set (Jolliffe, 1986) and it is concluded that this is one of the most popular multivariate analysis methods (Kassambara, 2017). This type of analysis has several restrictions, but it could be used as an initial step for common factor analysis (CFA) (Kim, 2008). For the current research, the available input data and the method is used to reveal some general relations that could be studied in more detail in future. Two groups of variables are analysed following the steps in Figure 2, and their content is:

- Problems of warehousing performance financial, limited solutions on the market for storage equipment and material handling machines, senior management's insufficient understanding, human resource (HR) hiring, HR training, limited IT resources, level of competition in the country, warehouse security.
- Priority warehousing management areas warehousing processes, material flows, stockkeeping unit (SKU) types, financial restrictions, software systems, warehousing key performance indicators (KPI), order picking, packing and labelling, and value-added activities.

Applied principal component analysis

Figure 2



Source: Author's illustration.

With these fundamental research approaches, the level of usage of information systems and technologies in warehousing will be revealed, as well as the factors that can speed up digital transformation processes.

4. Results

According to the collected data, the proportion of trade companies is 58.2%, and that of manufacturing is 41.8%, the difference being due to small enterprises. The total number of collected questionnaires is over 200, but only 134 were fully completed and included in the article. Convenience sampling is applied and data was collected through an electronic survey conducted in 2020 during the COVID-19 initial pandemic period.

Regarding the position held in the company, it can be determined that 28.4% of the respondents are representatives of the top management, 7.5% representatives of the production departments, 15.7% representatives of the marketing departments, and over 23% are representatives of the logistics department. For the companies' ownership, it can be noted that according to the self-reports (state, private, foreign, mixed, or combined), the proportion of private companies is 78.4%, state companies 1.5%, foreign companies 24.6%, and

companies with mixed forms of ownership 3.7%. A little over 70% are organisations that state that they manage from one to three warehouses, and those that manage between five and seven warehouses represent a little over 14%. For other organisations, the proportion of the total number is significantly lower.

4.1. Usage of information systems and information technologies for automatic identification

The level of implementation of different information systems and technologies is presented in Figure 3. The ratings are relatively low, which indicates an unsatisfactory level of use of software systems. The reasons for this are varied, including low quality and the cost of the solutions offered in the country (Rakovska, 2017). As a result, Bulgaria has been defined as lagging from EU-average about digitalisation (Chobanova, Kocarev, 2019). These low levels of application of information solutions slow down the construction of modern models such as Omni-channels, a practice which is defined as a source of competitive advantage for the Bulgarian food industry (Vodenicharova, 2020). According to the results, manufacturing companies have a higher degree of implementation of information systems, especially of ERP and WMS systems. On the other hand, the trade is more active in the field of e-commerce. An interesting point is the Electronic Data Interchange (EDI), which is imposed as a requirement by large retailers, and which smaller ones implement as well. The reduction of the document flow in the field of distribution is significant, and this way of working is starting to become preferred. Similar considerations can be made in the direction of automatic identification – the impact of the logistics labels on the distribution and supply chain efficiency requires further research in both literature and business practices (Kolinski, Osmolski, 2019).





Level of implementation of information systems and technologies

Software systems in warehousing are mainly used by the respondents for supporting warehousing processes such as: order processing, receiving deliveries, invoicing, inventory

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management, and order picking. According to the presented data, it is possible to conclude that the software systems are used in a conventional and basic way. An important activity like forecasting is supported in less than 20% of the cases. It could be noted that there is a gap between understanding about the included activities in the processes and the level of automation that is used. Forecasting, for example, is mainly understood as checking and following the inventory levels instead of having an automated system for forecasting that is connected online with the inventory management systems for the inventory management policy. This reveals the potential for more knowledge in that field. The importance of digital transformation-related knowledge and competencies is mentioned by Furjan, Tomičić-Pupek, & Pihir (2020).

Another point of view reveals the differences according to the organisation size (small, medium or large enterprises). Definitely, with bigger company size, the level of usage of different information systems and technologies grows. Large enterprises have a very high average level of implementation which means that they have fully integrated systems. At that time, small enterprises gravity around the balanced mean scores.

The respondents' intentions are definitely positive, and in general, in almost all areas, the development and broader implementation of information solutions in logistics are expected, as shown in Table 1. It can be noted that solutions such as company websites, barcodes, ERP and/or WMS systems are becoming standard. According to the stated intentions of the organisations, over 70% of them plan to be able to self-determine in three years that ERP has been partly or fully implemented, and in terms of WMS, the results are similar.

Table 1

Level of implementation of information systems and technologies in the next three years (means)

	Mean	Std. Deviation
Enterprise Resource Planning – Next 3 years	4.20	1.112
Warehouse Management System – Next 3 years	4.39	1.072
Electronic data interchange – Next 3 years	4.00	1.280
Company website – Next 3 years	4.43	1.076
E-commerce – Next 3 years	3.63	1.538
Radio-frequency identification – Next 3 years	2.84	1.439
Barcodes – Next 3 years	4.29	1.208

Source: Author.

The development of the topic of the level of application of information systems largely depends on the organisation's current situation and the subjective assessment of the situation. In essence, these answers can be determined as indicating potential factors for starting a change in the organisation. The answers are summarised in Figure 4.





In general, potential can be sought in the direction of external integration in the supply chain upon reaching certain higher integration levels within the organisation. Also, the relatively low estimates of automated support of logistics processes may be another opportunity for future development. The question in this direction of reasoning is "To what extent do you comply with the software system when organising the storage areas?" The answers are relatively neutral and gravitate around the mean value of 2.94, with the average value for trade organisations being 2.87 and 3.16 for manufacturing organisations. In both groups, the deviation in the responses is relatively high, over 1.40, and the difference between the two groups in the sample is not significant. In turn, this suggests to some extent that the software has more significant potential for future warehousing management. An interesting point is the relatively low ratings for financial problems in improving systems, which is a signal of a positive assessment by respondents of the use of software in warehousing and shows they are ready to invest for it.

Another point is assessing the supply in the country of various warehousing solutions, especially those related to warehousing software, consulting services, and innovations, as shown in Figure 5.

Evaluation of the solutions offered by the vendors



According to the data, there is a general attitude of low evaluation of the supply of software, consulting, and innovation in the field of consulting, which should be a signal and an opportunity to develop better proposals in the field for Bulgarian trade and manufacturing companies.

4.2. Level of usage of information solutions for order picking

Several processes take place in the warehouses, and the preparation of orders in the warehouses is a leading activity, which is mostly a measure of the performance and evolution of the warehousing system. Order picking is an activity related to the collection of goods and the completion of orders in warehouses. In essence, these are activities related to taking goods from the storage area to prepare the customers' orders. In many cases, the level of usage of information systems and technologies for these processes is crucial for the operator of the warehouse system.

The survey data answering the multiple-response question "What methods do you use to pick orders?" are presented in Table 2. According to the results, nearly 60% of respondents use order picking through paper sheets, which can be defined as a classical approach. Only 45% of them use barcodes, and the rest of the solutions have an extremely low usage, which is unsatisfactory.

Table 2

Figure 5

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	Percent of Cases
Paper picking	59.5
Pick by voice	1.5
Pick by light	0.8
Barcodes	45.0
RFID	8.4

Popular order picking methods

Source: Author.
- Economic Studies Journal (Ikonomicheski Izsledvania), 31(6), pp. 133-153.

The overall assessment of the level of use of individual automatic identification solutions, which is somewhat related to the previous question, is shown in Figure 5. According to the results, the respondents themselves describe the application of automatic identification technologies as relatively weak. The answers to the question show that the level of use of barcodes, which are widespread, is low, and the use of RFID is extremely low. This corresponds to the findings that some logistics activities such as transportation, warehousing, handling, receiving, order picking, packaging and dispatch of orders continue to be labourintensive (Stefanov, 2020). When examining the answers to the question compared to the answers to another question: "What methods do you use to pick orders? - orders are picked with a sheet of paper (paper picking)" with the Mann-Whitney U-test application, there is a significant difference. Definitely, organisations that are more technologically developed are less likely to apply paper picking.

Figure 5





Source: Author's illustration.

Another research issue is the organisations' plans for speeding up the process of order picking. The results are presented in Table 3. In general, the plans are to increase the degree of mechanisation and automation in the warehouse, update software systems, and improve HR motivation. No strong correlations can be found between the individual responses. Still, statistically, significant ones can be indicated (at p = 0.10) between implementing an automated system, upgrading the software system, and using barcodes or RFID.

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Table 3

Plans for improving order picking processes in the warehouse in the next three years

	Percent of Cases		
Material handling machines	52.3		
Automated storage system	40.2		
Software system update	52.3		
Increase number of employees	34.1		
Motivation and better payment of employees	56.8		
Usage of barcodes or RFID	27.3		

Source: Author.

Comparing the answers to the question, concerning the software system update, as well as the one for using barcodes or RFID, it can be determined that only 18.7% plan to implement both at the same time. 32.8% of those planning to update the software do not plan to implement the use of barcodes. Respondents who did not mark any of the two alternatives (barcodes or RFID) plan to improve the process by:

- Increasing the degree of mechanisation 26.5%.
- Developing an automated system 16.3%.
- More staff 23.5%.
- Motivation and higher salary of the staff 29.6%.

It is noteworthy that only 14.2% of those planning to improve the software system are focused on increasing the number of staff. Also noteworthy is the fact that 30.6% of them plan to increase motivation and provide higher pay for staff, which is above average. From the results, it can be assumed that organisations consider software systems a real alternative for warehouse management.

According to the research data, it is expected that small enterprises can be more active in most of the initiatives, excluding the usage of barcodes and RFID. Definitely, there is a significant difference between small and large enterprises with respect to the level of usage of material handling machines and human resource-related activities, which could be explained by their possible future development plans.

4.3. Knowledge of GS1 Standards in the field of logistics and warehousing

Standards for automatic unit identification are essential for ensuring the smooth movement of material flows in the supply chain and to the end-users. Recognising many terms and abbreviations is vital knowledge on the topic and is a prerequisite for the proper functioning of systems. According to the study data, it can be determined that the knowledge is not adequate, as shown in Figure 6.





Low average scores mean low levels of knowledge, which is a risk factor for errors in the management of material flows in the supply chain on the one hand, and inadequate use of the advantages of relevant technologies.

4.4. Application of intelligent warehousing solutions

The analysis of intelligent warehousing systems' application includes topics related to the IoT, RTLS, AR, big data, blockchain technologies, warehousing robots, AI, automated control systems, etc. Some of the respondents' average scores for their plans to implement solutions in the next three years are presented in Table 4.

Table 4

Figure 6

Level of implementation of information systems and technology innovations in the next three years (means)

	Mean
The iIternet of things next 3 years	3.63
Real-Time Locating System next 3 years	3.49
Augmented reality next 3 years	2.68
Big data next 3 years	3.17
Blockchain next 3 years	2.60
Warehouse robots next 3 years	2.47
Artificial intelligence next 3 years	2.24
Automated management systems next 3 years	3.30

Source: Author.

The data reveals that the level of the current implementation is extremely low, as is the intention to deploy smart warehousing systems in the future. This, in turn, is a risk factor for

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a future delay in the evolution of warehousing systems compared to global trends. However, the Internet of Things with an average score of 3.63, real-time positioning systems with 3.49, as well as automated management systems with a score of 3.30 can be mentioned as future areas of development. The prospects for the introduction of artificial intelligence and robotics are weaker.

The other part of the research methodology is related to PCA analysis. The first step is the factor extractions and descriptive statistics, with the exclusion of missing values. The results show that the Kaiser-Meyer-Olkin measure of sampling adequacy is more than 0.75 and Bartlett's test has a significance of less than 0.05. According to the scree plot, two factors are selected and a second calculation is performed restricted to the number of factors. Factor analysis rotation is also calculated with the Varimax method. The results are shown in Table 5.

Table 5

Rotated component matrix – Extraction method: Principal component analysis. Rotation method: Varimax with Kaiser normalisation

	Compo	onents
Financial	.471	.176
Limited solutions on the market for storage equipment and material handling machines	.626	.228
Senior management's insufficient understanding	.285	.595
HR hiring	.063	.888
HR training	.067	.866
Limited IT resources	.588	.436
Level of competition in the country	.716	.240
Warehouse security	.587	.038
No problems	690	.100

Source: Author.

One of the groups is related to the problems of HR, which is expected – HR hiring and HR training. The other group combines limited solutions on the market for storage equipment and material handling machines, limited IT resources, level of competition in the country and warehouse security. From these results, a discussion could be started about problems of warehousing performance:

- Level of competition is a powerful driver for the digital transformation of warehousing.
- The importance of the presence of solutions for warehousing on the market what alternatives do companies have for developing their warehousing systems? Here, not only storage systems and material handling machines but also IT solutions, consulting services etc., have to be included.
- Security concerns become important.

The other part of the analysis is related to the priority warehousing management areas. This will reveal the level of knowledge and will focus on the important warehousing problems. Dimensions include warehousing process organisation, material flow specifics, SKU types, financial restrictions, software systems, warehousing KPI, order picking (as one of the most important warehousing processes), packing and labelling, value-added activities.

Unfortunately, despite the high value for the Kaiser-Meyer-Olkin measure of sampling adequacy and the good Bartlett's test significance, multiple factors are grouped in the components. The reductions in general reveal:

- Factor one (Warehousing systems development) financial restrictions, SKU types and packages and software systems – with rotated values more than 0.7.
- Factor two (Intra-warehouse performance) material flows, order picking, KPI and warehousing processes, all with values more than 0.65.

It could be supposed that the software problems that are highly related to the digital transformation are not related only to the financial resources but also to the SKU types and their packaging in the supply chain. On the other hand, there is a strong focus on warehouse efficiency and it is correct that order picking is included.

5. Discussion

The research results overall reveal that the level of usage of information systems and technologies in warehousing is not very high. This leads to the conclusion that there is a real potential for improving warehouse performance and warehousing processes. Nowadays, use of Logistics 4.0 and Warehousing 4.0 is increasing and this is leading to the need for fast action in this area. Definitely, companies have to do something fast to catch up with world digitalisation trends. These problems are not unexpected and they may also exist in other countries and economies. The discussion topics in the article could be defined as:

5.1. Digital transformation and smart warehousing

A very important component in the whole process is RFID. Definitely, this technology has many more benefits than the other alternative for automatic identification (barcodes); it is fast, secure, allows multi-item scanning, different scanning ranges etc. RFID is a mandatory part of the IoT and implementing different RFID usages is fundamental to future IoT practices. These processes are tightly related to the warehousing communication infrastructure that will enable the IoT in warehouses. This implementation may support other innovations in warehousing, including unmanned aerial vehicles, which have better performance than humans (Fernández-Caramés et al., 2019). RFID and the IoT will ensure the efficient management of information flows, which will reflect positively on material flows management in warehouses. A related process is the implementation of automated systems and robotics, especially for the picking process.

These processes will generate complex IT structures that could be studied in more detail. The main challenges are related to the integration of the systems with the other supply chain members and the integration of the software systems within the organisation. These huge systems are expected to lead to the appearance of big data and problems with real-time analytics and information security. The processes also have to follow the leading trends for AI, blockchains, cloud technologies, AR and etc. The visions presented in the article are

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summarised in Figure 7. It should be mentioned as well that there is no universal roadmap for technology implementation because the approach is unique to each individual case and it is difficult to construct a universal assessment method. The presented ideas represent the general direction of evolution. The IoT in warehousing is a complicated problem that can be studied in more details and directions, as the visions presented by Mostafa et al. (2019) and Tejesh & Neeraja (2018), for example.

Figure 7



Digital transformation and smart warehousing perspectives

Source: Author's illustration.

5.2. Knowledge importance

There could be a discussion about the level of knowledge and about understanding of the real nature of the digitalisation of logistics and warehousing. Many companies have knowledge only of the general meaning of the different information systems and technologies, and the synergetic effect of their usage is not clear. This is leading to a need for education in the field of information systems and technologies for logistics competitiveness. Problems around the level of knowledge in the field of logistics are also revealed by Rakovska (2013, p. 211), while some specific knowledge aspects are considered by Mikova, Mihova, & Stefanov (2020).

5.3. Warehousing software and consulting market development

Digital transformation of warehousing is related to the solutions that could be found on the market. Nevertheless, despite the existence of a variety of technologies worldwide, local companies are dependent on the implementation by local specialists. In the studied case, a significant potential is found for warehousing software market development and more consulting services that must be focused on the warehousing performance.

Another discussion topic on the difference between the organisations' size could be defined. In some answers, there is a significant difference between the answers by the organisation's size and this could be studied in more detail. Large enterprises are expected to be more confident in their warehousing management, with balanced processes and a high level of usage of material handling equipment, automation, automatic identification technologies and digitalisation. Small and medium-sized enterprises (SMEs) work under higher market pressure and this leads to high motivation to adopt innovations and solutions for improved warehousing performance.

Several further research directions could be proposed. Knowledge is an important factor in digitalisation and this topic could be studied in more detail. A possible direction is the specifics of the SME for the digitalisation of the warehousing process – internal factors and motivation, obstacles, needed solutions, consulting perspectives etc. Another potential research area to focus on is trade enterprises which are in a very competitive environment.

6. Conclusions

From the analyses conducted, several conclusions can be drawn about the digital transformation perspectives in warehousing in Bulgarian trade and manufacturing enterprises, which could be extended to other international studies. The essential conclusions can be summarised in several ways.

In general, the level of use of various information solutions is still low and is not adequate considering modern views on modern logistics and supply chain management. This, in turn, is an indicator of the slow pace of digitalisation and digital transformation of logistics activities in the country. Findings of the study include that the problems are due to low knowledge of the nature and advantages of using information solutions, which shows the need for future development of various information campaigns aimed at increasing knowledge. Apart from that, there are significant opportunities for consulting organisations and software companies to offer innovative solutions. In general, there is a desire to invest in such solutions, but they must lead to real results in the field of warehousing. Nevertheless, important initiatives have been taken and there is a significant potential for future development. These results confirm the main hypothesis that the digital transformation perspectives for warehousing processes are relatively good and that the fundamentals for these processes have been established.

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Volume 31(6), 2022

EMPLOYEE ENGAGEMENT IN REMOTE WORK²

Until 2020 organisations gave their employees the opportunity to work from home as a perk intended to provide for favourable working conditions. The spread of COVID-19 and the restrictions imposed by governments made organisations worldwide switch entirely and in a very short time to remote work where the nature of the job allowed it. In these new working conditions, organisations changed their policies and employee engagement became one of the most common issues in recent research. This article is aimed to study employees' attitudes of engagement with their organisation when working from home as well as the factors that could increase employee engagement. The results from the author's two-stage survey of employees in Bulgarian organisations show that their engagement with the organisation has not decreased despite the long work from home due to the pandemic and the challenges associated with it. Keywords: engagement; remote work; COVID-19; factors affecting employee engagement

JEL: M12; M54; O33

1. Introduction

To a great extent, the success of a company is based on its employees' success, loyalty and engagement. Effective human resource management means that employees are managed as thinking subjects, which is the most significant challenge in an organisation. Employee engagement is related to the building and promotion of fruitful cooperation between an organisation and its employees, leading to the achievement of organisational goals. Employees who are engaged believe in the firm, have a desire to improve their job and their work, are willing to go above and beyond to help the firm succeed, and are inspired by its representatives.

Effectiveness and excitement are the trademarks of a dedicated worker. Disengaged employees, on the other hand, do the bare minimum, display little excitement for their work, and view work as a waste of time, to keep receiving paychecks. Employees who are disengaged are employees who have lost their passion for their job and hence, hamper the performance of the organisation. Organisations usually keep in mind that engaged employees

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² This work was financially supported by the UNWE Research Programme.

This paper should be cited as: Kicheva, T. (2022). Employee Engagement in Remote Work. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 154-171.

lead to increased productivity at work, which in turn leads to increased customer satisfaction and, without a doubt, an increase in sales and profit for the company (Chanana, 2020).

The emergence of the coronavirus in 2020 changed dramatically the way companies work everywhere around the world. The crisis caused by COVID-19 is unprecedented in nature, because it is primarily a public health crisis, which is a complicating factor that must be taken into account (Netseva-Porcheva, 2020). The covid-19 pandemic presented serious challenges to all stakeholders: organisation management, HR executives and employees. HR managers' to-do list is growing all the time: to take care of employees' health, keep company morale high, manage remote work, to decide whether and when to dismiss staff (The Economist, 2020). Now, most employers are faced with the difficulty of organising a remote work process or limiting the concentration of people in one place by taking adequate precautions: optimising working hours and vacations and changes in the focus of the business. But despite the extraordinary circumstances, human resources are the main engine of a business and its commitment to the employer's brand, mission, vision and goals should be an ongoing process.

COVID-19 forced companies to switch to remote work swiftly. Workplace transformation definitely has a lot of benefits for both employers and employees. Company management should not underestimate the fact that there is a need for a transformation of the strategy for the management of people in order to maintain their engagement and productivity. Company goals and values should be stated clearly and the expected results should have real parameters. Communication with the personnel is of paramount importance. In times of anxiety about their health and job insecurity, employees value an individualised approach increasingly, they want their voices heard and expect support when needed.

Chanana (2020) researched how different organisations engage their employees during the COVID-19 pandemic. Organisations are continuously inventing a novel and efficient ways to keep employees engaged during this difficult period. Work-from-home routine engagement activities have been found to be very beneficial for both employees and organisations.

In this regard, the *main aim* of the present study is to investigate employees' attitudes in terms of engagement with the organisation when working remotely as well as the factors that could enhance their engagement.

The main thesis of the study is that employees are more engaged with the organisation and in remote work if they are provided with long-term security in the workplace and individualised care for their needs.

Two major research objectives are formulated to achieve the outlined research goal:

- 1) To systematise and present the theoretical and methodological framework of the researh;
- To analyse the results from the author's empirical research and formulate recommendations for organisations with regard to the enhancement of their employees' engagement.

The accomplishment of the tasks set in the research is faced with the following *limitations*:

- The term "telework" is used to describe remote work in many countries around the world, but it is not present in Bulgarian legislation and practice. The Labour Code of Bulgaria defines the concepts of outwork and remote work (or distance working). In essence, however, the term "telework" defines the conditions for remote work. For this reason, the terms "remote work, telework or work from home" are used as synonyms in this article. All these words and expressions describe an increasingly adopted practice by organisations worldwide. It should be noted that remote work does not mean outwork. (Kicheva, 2021).
- According to the Labour Code of Bulgaria, remote work is "a form of organisation of work away from the employer's premises on employment relationship by using information technologies, provided that the said work was or could be performed at the employer's premises" (Labour Code, Art. 107h, para 1) and is significantly different from "outwork" which according to the Labour Code is "manufacturing a product and/or providing a service be carried out at the home of the worker or employee or in other premises chosen by them outside the working place of the employer against remuneration by means of equipment, materials and other aid provided either by the employer or the worker/employee" (Labour Code, Art. 107b).
- "Engagement" is a term that differs from the term "satisfaction". Satisfaction is the degree to which work satisfies the employee's needs in the short term, whereas engagement is related to the goal and corporate mission and is manifested in the long term.

2. Theoretical and Methodological Framework of the Research

The people behind each brand are the ones who make efforts every day. Therefore, their commitment should be supported and encouraged, especially in times of crisis when employee engagement becomes increasingly more important. When a worker/employee feels insecure about their future and at work and when they do not know what the direction of their company is and what actions its leaders are taking, they feel little engagement.

Especially in times of crisis, organisations appreciate the value of employee engagement as a key factor for productivity, employee retention and profits, but not all of them have a single strategic approach to the building up and maintenance of engagement. The companies that hire and retain motivated, engaged and responsive employees are more successful than those that do not.

The author of the study fully supports the opinion of Svelozar Petrov, CEO of Jobtiger, that engagement and motivation are of crucial importance for company productivity and results. Clearly set objectives, fair and accurate reporting are well received by people and give them clarity. But employers and managers, in particular, should allow enough time for individual meetings with each team member in order to hear people's fears and concerns and give them the required support where needed. People should also be convinced that not only company prosperity, but their own health and welfare are the management and owners' priority. Company reputation is markedly influenced by people's attitudes and in hard times, both its damages and benefits will be felt in the long term (Petrov, 2020).

In modern times, feedback (not only in the process of traditional annual employee performance appraisals, but also in routine work situations) is not limited to the description and justification of work tasks accomplishment, but is seen as an environment for professional communication with the team and for the provision of reasoned guidance on the development of their competences in the context of combining company and individual goals. Current and objective feedback is an essential part of the employer's brand and is a tool for attracting, engaging and retaining people in the company (Atanasova, 2019).

As a concept that has evolved in time, engagement has been defined in numerous and often controversial ways in literature and company practice. The currently available literature on employee engagement has been defined and explained from various different perspectives by various researchers and practitioners. The concept of engagement has recently received big attention from academicians and practitioners, but the frameworks used contain diverse items and measurement scales for the term Engagement (Robertson, Cooper, 2010). Engagement is seen as a multi-faceted psychological or emotional state, a way of thinking or a performing attitude.

Among the first academics who defined the concept of engagement in 1990 was William Kahn, a professor of organisational behaviour at Boston University's Questrom Business School. According to him, employee engagement is "the harnessing of organisation members' selves to their work roles; in engagement, people employ and express themselves physically, cognitively, and emotionally during role performances". Engaged employees invest considerable personal resources in terms of time and effort for the successful completion of their tasks and Kahn states that "when employees are treated not only as staff, but also as individuals, relations become more meaningful and in the context of relationships people make the decision about their thorough involvement in their work" (Kahn, 1990).

Luthans (2002) thinks that engagement is an employee's strong desire to remain part of an organisation, belief in and acceptance of company values and goals. Maslach et al. (2001) describe job engagement as characterised by energy, involvement and efficacy. Schaufeli et al. (2002) and Schaufeli and Bakker (2004) define engagement as a persistent, positive affective-motivational state of fulfilment in employees that is characterised by vigour, dedication and absorption. Shuck & Wollard (2010) define employee engagement as an alignment of every individual employee's cognitive, emotional and behavioural state towards organisational outcomes. Other researchers share the view that employee engagement can be defined as a positive, satisfying motivational state of the welfare related to work (Wood et al., 2020). Positive antecedents, such as job resources, positive psychological states and positive leadership and perceived organisational support are routinely linked with increased levels of engagement (Bailey et al., 2017).

A lot of consultancies specialising in the management of human resources have given definitions of engagement based on their research. CIPD (Chartered Institute of Personnel and Development) defines engagement as the combination of responsibility to the organisation and its values and the willingness to help colleagues. It goes beyond professional satisfaction and is not just motivation (Kicheva, 2013). According to Aon Hewitt (previously known as Hewitt Associates), it is a state of emotional and intellectual involvement of employees with the company and its business. Engaged employees usually: (1) speak

positively of the company, (2) want to be part of it and (3) make additional effort and do their best for the company success. Based on employee responses to "say, stay, and strive", engagement levels can be determined and used as a predictor of business outcomes.

Despite the lack of a unified definition of the concept, employee engagement is a key business engine for the success of an organisation. The view that employee engagement has a significant and quantitative impact on company opportunities to generate revenue and accumulate profit is shared by a number of researchers and practitioners, which is the reason why more attention has been paid to it over the last years. More and more employers are realising that employee engagement is a prerequisite for success.

Employee engagement results in a number of positive outcomes for both personnel and customers (Baldoni, 2013). Engaged employees do their job with passion, work more and are more productive. They are committed to the company and approach their work with energy and enthusiasm. The best employees accept change, look for ways to improve their performance and want everyone to feel personally responsible for the achievement of results. Engaged employees lead to increased work productivity which, in turn, leads to greater customer satisfaction and undoubtedly increases company sales and profit (Chanana, 2020).

The COVID-19 challenges for the business increased the importance of the survival and prosperity of the engaged employees in the current difficult situation and in 2020, the issue of employee engagement became critical to companies. Companies were forced to adapt to new business practices, including remote work. The COVID-19 pandemic has created an incredibly worrying and uncertain scenario in which every aspect of company growth and progress has become virtually impossible. Along with organisations, the human resources involved in them have been severely affected. Due to the lockdown and other restrictions, most companies enforce a policy for remote work in order to allow their employees to work from their homes (Kundu, Nag, 2021).

Since the employees who are teleworking are physically and psychologically separated from their workplaces, they tend to identify themselves with workplace organisation less strongly (Wiesenfeld et al., 1999), perceiving themselves as more independent (Guimaraes, Dallow, 1999). Besides, as the degree of remote work is increasing, there might be fewer noticeable reminders of their affiliation with the organisation (Wiesenfeld et al., 1999) because the physical signs such as symbols, premises and office ambience are increasingly absent from their daily routine. This suggests that with extensive remote work, engagement will decrease.

According to the author of the study, more than 20 years after the findings of the cited researchers, they are no longer fully relevant, because, although physically separated from the workplace, modern employees are not necessarily psychologically separated. New information and communication technologies and platforms such as Teams, Zoom, Google Meet and others allow employees to make video connections in real time, which psychologically integrates them into the work, even though they are not physically in the company's office. In addition, more and more employees are providing opportunities to psychologically connect with their employees through a variety of innovative initiatives such as virtual operatives, video links and even virtual coffee drinking with their employees through the above platforms, etc.

Both positive and negative aspects of remote work are enumerated in the literature. According to the author of the study, one of the positive aspects is that remote work gives employees a greater opportunity to focus on their work tasks. Teleworking employees can reduce contact with their colleagues significantly. Studies reveal that remote work is associated with fewer interruptions (Bailey, Kurland, 2002). Furthermore, remote work is often associated with greater flexibility in the work schedule. Some employees are more productive when they work in the morning, whereas others are more productive late at night.

As Tuyo (2020) reports, research of University Credit Union shows that the employees who are given greater flexibility at work, actually become more productive team members. If a team member needs to leave their desk at home for a personal reason, it will not actually have a negative impact on their productivity on that day. Flexibility on a workday helps teams feel happier (regardless of everything else going on in their lives) and improved communication helps guarantee the completion of all tasks for the day. Remote work makes teams focus on common goals, which facilitates effective task coordination. Since no one supervises teleworkers physically, they have more freedom to decide how, under what conditions and sometimes when to accomplish their work tasks (Kossek, Thompson, 2016).

However, remote work is a challenge to employees as well, for they cannot feel the organisational climate at home, they often lose concentration because of interruptions by family members, which leads to a conflict between work and personal life. According to Chaudhary et al. (2021), numerous studies show that remote work results in serious problems in employees' personal lives caused by the elimination of the clear distinction between working time and family time. Misunderstandings and conflicts between employees and their families rise and such conflicts are not easily solved in this situation. The same authors also find that employee engagement is negatively affected by the number of employee children, i.e. the bigger the number of employee's children, the more difficult it is for them to focus on their work and thus, their engagement declines (Gilpin-Jackson, Axelrod, 2021). According to the author of the present study, it is not the number, but rather the age of the children that negatively affects the engagement of employees. Employees with younger children logically have lower engagements, as these children require more parental attention and this prevents employees from focusing on their work tasks. Employees can hardly remain enthusiastic at work in such a situation and, as a result, productivity and performance are affected, which leads to negative results.

Another weakness of remote work is that some employees do not have the necessary equipment and devices at home, such as a computer, a mouse, printers, scanners, headphones, a web camera, a broadband Internet connection and a special workspace. These inconveniences hamper communication and work completion, which affects employee engagement (Gilpin-Jackson, Axelrod, 2021). According to the author of the study, these inconveniences can be easily overcome if the employer provides the necessary equipment for employees working from home.

In the last two years, some employees have been worried and anxious about their health. Due to the lockdowns and numerous restrictions that were imposed, employees have been working under pressure, in more stressful conditions and duration of work, without long-term job security, and are anxious when working from home, etc. After the big lockdowns had been withdrawn, the business started to return to their offices step by step, but a great number

of employees are still working remotely. All this has changed the ways employees maintain their effectiveness and involvement at work, especially when teams are scattered – some work entirely or partly remotely, others work in the offices. In the conditions of teleworking, companies had to come up with new ways of enhancing or at least maintaining the same level of employee engagement. Companies are trying to reduce their employees' stress and compensate the loss of their social lives through various activities. A lot of organisations encourage their staff to keep the balance between work and family life.

Data from a survey carried out by KPMG (May 2020) reveal that over 75% of organisations have redefined their employees' engagement as well as their organisation's communication strategies in order to guarantee high employee engagement in the situation of the COVID-19 pandemic. According to the survey, it is understandable that due to the exclusion from the office environment, employees get bored more easily and cannot maintain the quality of work. These are the reasons why the human resource managers of the surveyed companies have taken care of their employees through telephone and video chats and by providing the necessary assistance to make them feel a vital part of the organisation. In addition, employees have been reassured about their job security, financial security, company financial status and the future action plan for workforce retention (Sarmah, Chaudhuri, 2021).

According to Chaudhury et al. (2021), activities such as online practices for family involvement; online training and development programmes; assessment sessions; video conferencing during lunch; online training aimed at developing new skills; online consulting to cope with stress and anxiety; virtual game sessions; brainstorming sessions; etc. help employees significantly to cope with the loss of enthusiasm and inspiration for work as well as to reorganise and improve their personal and company goals. There are various determinants of employee engagement and leadership is one of the important ones. It is beneficial, especially when it comes to assistance and feedback. Regular communication between employees and leaders matters to employees in terms of receiving adequate support. Leaders should hone their skills for human resource management in times of crises, for identification and provision of the necessary resources for their teams and for strengthening the relations between teams in order to exchange additional knowledge and skills.

In the present tense time of anxiety and insecurity resulting from COVID-19 and when companies are forced to save money, Mani and Mishra (2020) explore the non-monetary factors that HR experts could use to enhance employee motivation and engagement. HR managers who used to rely on monetary incentives such as pay rises and other monetary privileges to inspire their employee, now have to rely on non-monetary incentives such as recognition and career development to maintain employee engagement. Implementing measures assisting staff in the balancing between work, professional and private life has a positive effect on employee engagement.

Puneet Kumar (2021) suggests five fundamental components of employee engagement, namely value, voice, variety, virtue, and vision, which HR managers can readily avail of to enhance employee engagement in these perilous times. This 5-element structure can be attributed to both individuals as well as organisations. The model requires very little to no monetary investment, yet it demands a high degree of attention and focus on being able to gain benefits from the application of this model.

Experts worldwide predict that the COVID-19 crisis will not end soon and it will probably take years to go back to some normality and the natural flow of the business will probably take years to recover. In these conditions, organisation HR managers become extremely important for the maintenance of employee engagement.

The major research question is: Which are the factors that would retain employees in an organisation and would engage them with its goals and values in the conditions of remote work? The answer to this research question is given on the basis of an empirical study whose results are presented in the following part of this article. Two working hypotheses are formulated to prove the main research thesis:

- 1) Employees working remotely for a longer period feel less engaged with the organisation.
- The flexible working time and the work-life balance in remote work increase employee engagement.

Table 1

Respondent distributio	n by gender, age,	, educational	degree, pla	ce of residence,	average
monthly in	come and size of	f the company	y respondei	nts work for	

Demographic criterion	Number of persons	Relative share (%)
Gender		
Men	49	34
Women	95	66
Total	144	100
Age		
Aged 19 – 29	30	20,8
Aged 30 – 49	96	66,7
Over 50	18	12,5
Total	144	100,0
Educational degree	e	
Doctoral degree	6	4,2
Higher education	98	68,0
Secondary education	39	27,1
Lower than secondary education	1	0,7
Total	144	100
Place of residence		
Capital city	99	68,7
Big (district) city	19	13,2
Small town	20	13.9
Village	6	4,2
Total	144	100
Company size		
Up to 50 people	46	31,9
Between 50 and 250 people	27	18,8
Over 250 people	71	49,3
Total	144	100
Average monthly income (option	onal question)	
Up to 1000 lv.	22	30,1
Between 1001 and 2000 lv.	38	52,1
Between 2000 and 3000 lv.	9	12,3
Over 3000 lv.	4	5,5
Total	73	100,0

In order to test these hypotheses, the results from the author's two-stage survey of employees in various Bulgarian organisations are used. The first stage of the survey was carried out in April 2020. It included 144 employees of over 19 and working in public and private Bulgarian organisations of different size (see Table 1).

The first stage of the study was conducted through social media – Facebook and LinkedIn. The sample of the survey is unrepresentative, conducted with the help of volunteers. For that reason, the obtained results should not be generalised for all Bulgarian employees and concern the appraisals and predisposition only of the people who took part in the survey.

The first stage of the study was carried out through an anonymous survey in which respondents could leave their e-mail addresses if they were interested in receiving the survey results. Prior to the conduction of the second stage of the research, the respondents who had left their e-mail addresses were contacted by e-mail. It turned out that as of November 2021, 76 of them continue working remotely all the time or with regular visits to the office. The second stage of the research was carried out with these 76 respondents who kept working remotely (see Table 2).

Table 2

Criterion	Number of persons	Relative share (%)			
Gender					
Men	21	27,6			
Women	55	72,4			
Total	76	100			
Age					
Aged 19 – 34	15	19,7			
Aged 35 – 55	51	67,1			
Over 55	10	13,2			
Total	76	100,0			
Educational degree					
Doctoral degree	1	1,3			
Higher education	61	80,3			
Secondary education	14	18,4			
Total	76	100,0			
Place of residence					
Capital city	57	63,5			
Big (district) city	9	11,5			
Small town 10		25,0			
Total	76	100,0			
Company size					
Up to 50 people	25	32,9			
Between 50 and 250 people	20	26,3			
Over 250 people	31	40,8			
Total	76	100,0			

Respondent distribution by gender, age, educational degree, place of residence, average monthly income and size of the company respondents work for

Since the time of the second survey is almost two years after the beginning of the pandemic, the research assumptions are that: people have already gotten accustomed to the situation, they are not very stressed, they have gone back to a relatively normal way of living and working and their perceptions of their engagement and their predisposition towards their employers would be more objective compared to the first survey.

In order to achieve the main goal of the research and to test the main thesis and working hypotheses, basic questions were asked to the respondents (Table 3).

Table 3

N₂	Question
1	Are you working remotely now?
2	Would you recommend your organisation as a good place to work to friends, relatives and acquaintances?
3	Are you considering leaving your organisation?
4	Do you think you are an engaged employee?
5	Which factors affect your engagement while you are working remotely?
6	Which factors enhance your engagement while you are working remotely?
7	Which factors would increase your engagement with your organisation after the end of the pandemic?
8	Would you like to continue working remotely after the end of the pandemic?

The degree of engagement of employees in the organisation was studied based on their subjective sense of engagement and their attitudes to remain part of the organisation and recommend it as a good place to work for relatives, acquaintances and friends (tested by questions 2, 3 and 4 – see Table 3). According to the author, the engaged employees would stay to work in the organisation and, when possible, would recommend it as a good place to work to their relatives and friends. Attitude is the readiness of the individual to act or react in a certain way. It is always related to evaluation or some expectation. Attitudes in the present study were measured using a one-dimensional method using rating scales. The one-dimensional method is suitable for the study because the aim is to cover the affective components of the attitudes of the respondents' engagement in the study. Additional questions were asked about the reasons why employees would or would not recommend their organisation to relatives and friends and would continue to work in it or leave it, which according to the author, will enrich the results of the study.

The respondents were asked the questions in Table 3 in both surveys to see if there was a change in their attitudes to work and their organisation at the beginning of the pandemic and the introduction of the state of emergency and while teleworking. The present study covers only the subjective attitudes of employees' assessment of their degree of engagement with the company. The survey did not examine the employer's opinion and objective indicators such as level of employee performance, increase in customer satisfaction, improvement in the working climate in the organisation and in employee cooperation, etc., which could be seen as results from employee engagement. Research results are related to the particular group of surveyed respondents and cannot be generalised to all Bulgarian employees. In this regard, the results cannot be used for making universal decisions. However, they can serve as the basis for a more extensive study conducted by organisations and focused on the degree of employee engagement and the methods to enhance it during and after the pandemic, regardless of the mode of work.

3. Analysis of the Results from the Empirical Research and Formulation of Recommendations for Enhancement of Employee Engagement

The results show that 68.1% of the respondents who participated in the first stage of the research were working remotely at the moment of the survey conduction, entirely or with short visits to their office. It is noteworthy that in both stages of the research, the percentage of female employees working remotely is higher, most probably because the number of women who participated in the surveys is considerably bigger compared to that of the male respondents. The highest percentage of employees working remotely as of November 2020 are people living in Sofia (the capital of Bulgaria) and in the big district cities. The author sees the reason for this in the fact that in the smaller places, most of the respondents have jobs requiring more physical presence, while in big cities, most people do jobs in offices and their work can be done from home as well.

At both stages of the research, the predominant part of the respondents say that they would recommend the organisation they work for to their friends, relatives and acquaintances, with the results from the survey conducted in November 2021 showing a higher percentage – 68.4% compared to 49.3% from the survey conducted in April 2020. This can be explained by the efforts made by employers during the last year and a half of the pandemic to make their employees feel secure and valued by the organisation, regardless of the critical situations the organisation encountered when some of the work restrictions were introduced. At the beginning of the pandemic, employees seemed more reserved with regard to recommending their organisation as a good place to work because their organisations had not yet adapted to the new situation and had not adjusted their policies for human resource management, which made employees feel more insecure. Nevertheless, only 8.3% of the respondents in April 2020 and 5.3% in November 2021 say that they will definitely not recommend the organisation they work for as a good place to work (Figure 1).

Figure 1



Respondents' attitudes to recommend their organisation as a good place to work to their friends, relatives and acquaintances

In April 2020 a total of 16.7% of the respondents say they are considering leaving the organisation they work for different reasons: lack of employer's empathy with regard to the introduced state of emergency, income reduction, bad forecast for the organisation's development or because this was the organisation's intention before the pandemic. Over half of the respondents, 55%, confirm that they would not leave because they like their work and organisation, 24.2% - because they are happy with their salary, 15% would not leave because they are afraid that they would hardly find another job in the looming crisis. The respondents who are not considering leaving are mostly graduate employees working in big organisations (over 250 people), which in the author's opinion is most probably due to the fact that these employees are in higher positions in their organisation and are satisfied with their remuneration and working conditions. The results from the survey conducted in November 2021 show that the percentage of the people who are not considering leaving their organisations for different reasons remains almost the same as the one for the previous stage of the research -54,5% of the respondents like their work and their job, 28.8% are satisfied with their salary, 13.6% are afraid to leave because of the crisis and only 13.1% have considered leaving their organisation. A considerable proportion of the respondents surveyed in November 2021 (22.7%) would not leave their company because they felt their employers' support and concern. In April, this percentage is lower - 14.2%.³ In the author's view, the similar values in the answer sat the two stages of the study are due to the fact that despite the health and economic crisis in the last two years, employers have been trying to maintain their employees' income and working conditions in order to retain them in the organisation. Providing individualised assistance tailored to each employee's needs has strengthened employee engagement with the organisation.

When asked directly if they find themselves engaged employees, 61.2% of the respondents in April 2020 and 70.9% of those who participated in the survey in November 2021 were positive, 10,7% in April 2020 and 7.3% in November 2021 considered themselves disengaged and the rest are not certain how they feel. The results from the answers to this question give a reason to reject the first working hypothesis, according to which employee engagement decreases with the increased duration of remote work.

The respondents who participated in both surveys clearly realised which are the positive and the negative factors for remote work. Their views on the factors hampering engagement differ significantly in the survey in April 2020 and then in November 2021. At the same time, they are more unanimous with regard to what contributed to their increased engagement during the period of their remote work (Figure 2 and Figure 3).

At the beginning of the pandemic, the surveyed employees had less information about company goals and plans compared to a year and a half later. The reason for this can be the confusion and the lack of clear goals and plans in organisations when the state of emergency and the restrictive measures were introduced. Naturally, much fewer of the employees surveyed in April 2020 (30.2%) felt a lack of personal contact with their colleagues and managers compared to the November 2021 survey (58.3%) when employees had been

³ The total of the percentages is more than 100 because the respondents were allowed to choose more than one answer to the questions about the reasons for considering or not considering leaving the organisation.

working remotely for more than a year. It is quite logical that more conflicts arise in a team after a long period of remote work, which was reported by 48.9% of the respondents in November 2021 compared to 19% of the respondents who participated in the April 2020 survey. When remote work was introduced, many more of the surveyed employees found it difficult to draw clear boundaries between their private and professional lives (64.9%), whereas over time, they learned to do it.











⁴ The total of the percentages is more than 100 because the respondents were allowed to choose more than one answer.

It should be noted that at the beginning of the pandemic, employees strongly appreciated the opportunity to work in a safe and comfortable environment, which can be expected given the strict restrictions imposed with the state of emergency as well as the initial shock and anxiety about personal health. Flexible working hours are important for employees both at the beginning of the pandemic and in November 2021. The opportunity for better concentration with remote work is more appreciated by the respondents in November 2021, which according to the author, is due to the fact that at the beginning of the pandemic, schools were closed and the presence of children at home prevented employees from concentrating on their duties. The balance between work and private life as a factor for enhanced employee engagement is found important by the respondents in both stages of the study. After the initial confusion caused by the emergence of the virus and the high appreciation of the opportunity to work in a safe homely environment, increasingly more respondent employees who were surveyed in November 2021 consider this balance particularly significant for the enhancement of their engagement. To sum up, it can be said that the results obtained for this question of the survey confirm the second working hypothesis stating that the flexible working hours and the balance between work and private life when working remotely increase employee engagement.

When asked about the factors that would make respondents more engaged with their organisation after the pandemic, their answers reveal that at the beginning of the pandemic long-term job security and the opportunity to work remotely are most appreciated, which could be due to employees and organisations' insecurity because of the introduced restrictions and the anxiety about employee health (See Figure 4). The November 2021 survey shows that most respondents would feel more engaged if the remuneration was higher and the opportunities for development were better. At the time of the survey, almost two years had passed since the beginning of the pandemic, and respondent employees must have become accustomed to the new working conditions and were already thinking of their future development. Given the serious rise in the prices of electricity and all goods in general, it is not surprising that higher remuneration turns out to have a greater impact in the future as part of the tools for employee engagement and retention.

Figure 4





The COVID-19 pandemic has already led to significant changes in the attitudes of both employees and employers. It might change the way companies work worldwide in the future. According to experts in the field of human resources, the business world is ready for a hybrid mode of work, combining work in the office with remote work. The employees who participated in this survey confirm this view. Only about a third of them are not ready or unwilling to work from home in the future. The rest would like to work remotely, though not all the time (See Figure 5). It is noteworthy that the initial enthusiasm of the surveyed employees with regard to remote work in the future has diminished within a year and a half after the beginning of the pandemic -31,8% in April 2020 and only 19.8% in November 2021 indicate that they would definitely like to work remotely after the pandemic. The reason might be the fact that while teleworking, employees have faced some problems and, over time, they have started missing the personal contact with their colleagues in the office more.

Figure 5



In this situation, employers will have to find the appropriate tools to engage their employees. They will also need a new set of leadership skills. Employee engagement and retention become a top priority – the way of management is a key factor for employee effectiveness. Research results provide for the formulation of several major conclusions and recommendations to employers for enhancement of employee engagement in the future, when some employees will work remotely, others – in the office, and others – in a mixed mode:

1. In the future, remote work will not be perceived by employees as a perk, but as a reality. More and more employees will be interested in flexible working hours and will be requiring to work remotely for at least one or several days a week. Flexible working hours, including the opportunity for teleworking, would retain valuable staff in a company. However, the transition to a hybrid mode of work requires not only the necessary company tools and infrastructure for remote work, but also substantial changes in security and structural adjustments, which employees should be well aware of. A set of clear guidelines are needed in order to help employees get accustomed to this new way of working. To cope with the challenge of remote work, companies need to plan long-term decisions and adapt their company culture to the new reality.

- 2. Among the most serious challenges of remote work indicated by the respondents and preventing them from being engaged with their organisation is the lack of personal contact with their colleagues, the difficult communication with managers and the insufficient information about the company goals and plans. To increase employee engagement, companies have to reconsider their communication strategy and focus on the improvement of personal communication. No matter whether employees work remotely or in the office, they should be well informed about company goals and future, the changes planned, company mission, vision and values. Communication needs to be not only sufficient, but also regular. To improve team effectiveness in remote work, companies should encourage staff cooperation and team spirit. Company leaders should pay attention to the impact of the lack of physical contact and to spend enough time for both team meetings (real and virtual) and individual conversations with each team member in order to hear what employees' problems and fears are as well as to provide the necessary support. Employees should be convinced that along with company success, their personal health and welfare are also a company priority. People engage with their work and organisation if they feel supported, so leaders should find a way to support their teleworkers as well.
- 3. Another significant challenge the respondents working remotely are faced with is the blurred line between work and private life. For an employee working remotely, it is more difficult to make a difference between their working time and family (personal) time. In pandemic times, increasingly more people say that at home, they spend much more time working than in the office and they cannot spend enough time with their families. Hence, employers should actively invest in initiatives facilitating the balancing between employee work and private life. Managers and human resource departments should communicate with employees about their welfare in the workplace. To maintain employee engagement, caring for employee welfare should become part of organisational culture. The good practices for keeping the balance between work and private life when working remotely include: employee's requirement for a daily schedule with particular work tasks, counselling employees on how to organise their workspace at home, and providing individual and professional support for employees. The work-private life balance is different for each employee. This is why company managers should talk to each team member and find out what their personal responsibilities (children, pets, hobbies, etc.) are and give them support so that they could organise their work from home in a way that would help keep the balance between work and private life. Implementing measures facilitating employees to maintain the balance between professional and private life has a positive impact on the level of employee engagement.

Conclusion

Employee engagement is of paramount importance, especially during the current COVID-19 pandemic. In difficult times, organisations realise that engaged personnel is of critical importance for their success. The trends for remote work accelerated by the COVID-19 pandemic are unlikely to disappear because employees find teleworking more productive and attractive. The organisations willing to avail of the enhanced employee engagement and experience should give their staff the opportunity for remote work even after the end of the COVID-19 pandemic.

The current study highlighted the main challenges for engaging employees working from home. The main goal of the study was achieved – to assess the extent to which the surveyed employees feel engaged in their organisation when working from home and what are the factors that could increase their engagement

The results from this research showed that employees engage when they feel that their organisation is concerned about their well-being. They give direction to the employers, despite the financial challenges posed by the serious rise in prices in Bulgaria, to continue investing in their employees – not only financially, but also in attitudes and non-monetary incentives to make their employees happy and committed through various programs aimed at enhancing employee engagement. The potential beneficiaries of this study are HR practitioners, internal communicators and managers in various sizes and fields of activity of Bulgarian companies who could improve their communication with employees, identify the factors that engage their employees and make them "ambassadors" of their employer brand, recommending the company as a good place to work for his relatives and acquaintances. The results of the present study could be used as a starting point for further large-scale and representative research in the field of employee engagement in Bulgaria.

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Volume 31(6), 2022

THE IMPACT OF THE PUBLIC PROCUREMENT SYSTEM REFORM ON BULGARIAN SMALL AND MEDIUM-SIZED ENTERPRISES²

Public procurement can be used as an instrument for policy-making in different fields – social, environmental, economic, as well as for direct business support. It is well known that the increased participation of SMEs on the public procurement market leads to significant benefits for both contracting authorities and society. A lot of studies have found that SMEs are inadequately represented in this market. Therefore, in 2016, the European Union introduced common measures to promote the participation of SMEs in the public procurement market. A critical review of these measures has been made, highlighting some of their strengths and weaknesses. Based on the analysis of the public procurement market in Bulgaria, the measures are assessed as insufficiently effective. The proposed solutions are in two directions: how to motivate contracting authorities to implement the introduced measures and how to increase the confidence of SMEs in the procurement process in order to encourage them to participate in tender procedures.

Keywords: public procurement; SMEs; access to public procurement market; Bulgaria JEL: H57; D41

1. Introduction

The significance of small and medium-sized enterprises (SMEs) was reconsidered during the 60s and 70s of the 20th century as a result of the changes in the socio-economic structure of developed countries. The role of SMEs in Central and Eastern Europe increased significantly during the transition to a market economy. According to Klapper, Sarria-Allende and Sulla (2002), the restructuring and decrease in the number of large companies, the privatisation of utility companies and other large companies and the outsourcing of a large number of services are all prerequisites that promote the establishment and development of SMEs. Over the past few years, there has been a growing interest in SMEs and their role in the economy. They are an important source of entrepreneurship skills, innovations, competitiveness and jobs.

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² This paper should be cited as: *Hristova, S. (2022). The Impact of the Public Procurement System Reform on Bulgarian Small and Medium-Sized Enterprises. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 172-184.*

- Economic Studies Journal (Ikonomicheski Izsledvania), 31(6), pp. 172-184.

According to the European Commission (2003), the category of micro, small and mediumsized enterprises includes enterprises which employ fewer than 250 persons and have an annual turnover not exceeding EUR 50 million and/or an annual balance sheet total not exceeding EUR 43 million. A number of studies show that small and medium-sized enterprises are 99% of all enterprises in the EU (out of a total of 20 million) and provide 67% of all jobs in the private non-financial sector. They create two out of each three jobs; they maintain an employment growth rate that is twice as high as the one maintained by larger companies and they generate approximately 59% of the economy's added value (Stawińska, 2011).

This means that SMEs can be viewed as the main driver of economic growth, innovations and employment. They are the backbone of each economy and fall within the focus of different economic policies. SMEs are particularly important for the economy, but, at the same time, seem to experience challenges accessing the public procurement market. According to data from the European Commission (2017), SMEs have been directly awarded with approximately 45% of the total value of public contracts, either as participants in consortia, or as subcontractors, which does not correspond to their market share. Therefore, the facilitation of SMEs' access to the public procurement market is considered to be one of the instruments for unleashing their potential, which, on the other hand, will also bring certain benefits to the European economy (SIGMA, 2016).

The purpose of this study is to make an overview of the reforms in the public procurement system over the past few years undertaken to encourage the participation of SMEs in this market, to see how this affects small business in Bulgaria and, based on this, make recommendations for improvement of the public procurement system in Bulgaria.

This research makes a brief critical overview of specialised literature on the subject and the economic policy followed, with a focus on the relationship between public procurement and SMEs. It analyses the pan-European measures promoting the participation of SMEs in the public procurement market, which were introduced with the reform of 2014, and mentions some of their advantages and drawbacks.

In order to determine whether Bulgarian SMEs are adequately represented on the public procurement market, certain evidence about their level of involvement has been presented. The analysis is based on two sets of data – a survey to identify the attitudes and barriers for SMEs and secondary data from reports by the European Commission, as well as data from the Open Data Portal and the Public Procurement Register, where information about the value and number of contracts awarded as a result of public procurement procedures is published.

2. Public Procurement and SMEs

The term "public procurement" is defined in the Oxford Dictionary of Economics (2008) as "the purchase of goods and services by the public sector, at all levels of government". In practice, public procurement is not just limited to the formal process of purchasing, but comprises of four stages (Hristova, 2013) – from identification and planning of the need, through the selection of the contractor to supply the goods in the exact quantities and quality

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at the right time and place for the best price, to the control and follow-up evaluation of the implementation of the awarded contracts. The organisation and conducting of public procurement procedures are accompanied by a number of problems, such as complexity and duration of the procedure, utilisation of additional resources, risks of not receiving any quotes, etc. (Karakasheva, 1995). The complexity of public procurement is also affected by the participation of a large number of stakeholders (public and sectoral contracting authorities, regulatory and controlling authorities, economic entities - applicants and participants, the society) and the need to find the balance between their diverging interests. The organisation and conduct of public procurement procedures are subject to strict legal regulations with the main purpose, according to Goleva and Markov (2004), to increase the efficiency of the utilisation of public funds, while at the same time protecting the consumers of public services. By restricting the freedom of contracting, while at the same time guaranteeing the possibility for competition at a level playing field for many legal entities, the applicable European directives, particularly the Public Procurement Act (PPA), ensure the cost efficiency of public funds (Art. 1(1)(1) of PPA). The applicable national legislation has laid down the terms and conditions for awarding public contracts both by public authorities and by sectoral contracting authorities that spend funds for activities of public interest (such as water supply, energy, transportation and postal services). The rules for public procurement have been established in order to guarantee the application of the four principles of awarding contracts: publicity and transparency; free and fair competition; equal treatment and non-discrimination; and proportionality. The observation of those rules promotes better utilisation of resources, including those provided by the European funds and programmes. According to data from the European Commission (2017), almost half of the European structural and investment funds are spent through public procurement.

Some authors argue that the economic, social and environmental benefits of public strategies and programmes are largely dependent on the way public procurement procedures are managed, held and controlled (Khan, 2018). It is assumed that these benefits are great, because states spend a significant percentage of their gross domestic product for acquiring goods, construction and services through public procurement procedures. Nearly all EU member states have increased their public spending and it was estimated in 2017 that the spending of public authorities and utility companies that could be considered expenditure by means of public procurement procedures constitutes 12.2% of the EU's gross domestic product (European Commission, 2019). The same report says that the estimated spending for construction, supplies and services (other than utility services and certain concessions) as a percentage of GDP for the same year for Bulgaria is 9.4%. Over the past two years, as a result of the increased public spending in response to the Covid-19 pandemic and the decline in GDP as a result of the crisis, OECD (2021) observed a sharp increase in the public contracts as a share of GDP in 2020. This has increased the need to make their organisation more effective.

Public authorities, as some of the largest buyers on the market, should use public procurement as an instrument for policy-making in different fields related to environmental protection, the introduction of innovations or the promotion of social inclusion. SMEs are increasingly regarded as a key factor for the development of the economy (OECD, 2018). Kim Loader (2013) discusses the public procurement – SMEs relationship in two directions. On the one hand, public procurement procedures are an instrument that can be used by the governments - Economic Studies Journal (Ikonomicheski Izsledvania), 31(6), pp. 172-184.

for providing direct support to the small business, while, on the other, the increased involvement of SMEs will result in significant benefits for the contracting authorities and the economy as a whole. The most common benefits cited in the literature (OECD, 2018) that SMEs could offer to contracting authorities are better price/quality ratio, better level of service and innovative solutions. According to Flynn μ Davis (2017), SMEs' easier involvement on the market will guarantee greater competition and will ensure access to a wider variety of available and innovative solutions.

The data shows that the EU's average share of contracts under public procurement procedures awarded to SMEs was 29% in 2013 (SBA, 2014). Although it increased to 51% in 2017 (SBA, 2019), it remains disproportionate to the share of SMEs in the economy as a whole. Nicholas and Fruhmann (2014) believe that this is a proof of market failure, which requires corrective actions.

The available literature discusses and analyses the barriers that hinder SMEs' access to public contracts. Loader (2013) divides them into two groups - those arising from the public sector and those related to SMEs. In a survey held in 26 OECD countries in 2017, the respondents mentioned 10 key limitations for SMEs' access to this market (OECD, 2018). Other authors have classified the challenges for SMEs to participate in public procurement procedures based on the different stages - access to information, pre-selection, bidding, administration of the contract and ongoing management (Liao et al., 2017). It can be summarised that the main barriers/challenges for SMEs identified in the different analyses can be classified into several categories: difficulty obtaining information; high administrative burden; lack of knowledge about the procedures; excessive selection requirements; large contract amounts; little time for preparing for the bids. The conclusions made by the European Commission (2008) also support this statement. Because the share of SMEs in the public contracts awarded does not match their market share, different policies, initiatives and measures have been developed over the past few years to facilitate their access to the public procurement market. The strategic objectives of the policies conducted at the European Union level are to facilitate SMEs' access to public procurement by ensuring a level playing field. These policies are expected to result in stimulation of employment and promotion of innovations, i.e. growth of the national economies, which is essential during a period of crisis.

Undoubtedly, the higher rate of participation of SMEs in public procurement would be a favourable environment for their development. Public contracts are a market opportunity that could provide them with a large and reliable buyer and potential long-term contracts (Reijonen et al., 2016). Furthermore, the application of effective policies for facilitating their access to public procurement could result in a number of economic and social benefits for the society as a whole, because the small business contributes significantly to the opening of new jobs and adds value.

3. Key Measures to Promote SMEs' Participation on the Public Procurement Market

SMEs' access to public procurement could be directly encouraged through preferential treatment, that is, positive discrimination. This approach has been applied in certain countries, such as the USA and Australia (Loader, 2018). However, it is inapplicable in EU

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member states, given that the European regulatory framework requires equal conditions for all participants.

The latest pan-European reform in the field of public procurement was finalised in 2014 with the adoption of a legislative package of three Directives: Directive 2014/24/EU on public procurement; Directive 2014/25/EU on procurement by entities operating in the water, energy, transport and postal services sectors and Directive 2014/23/EU on the award of concession contracts. One focus during the review of the rules for awarding public contracts by the European Commission was to facilitate SMEs' access to public procurement without giving rise to preferential treatment of this category of economic operators. According to a report by the European Parliament (2009), the efforts focused on two aspects – simplification of the procedures and revising the rules related to subcontractors. Time and money are the focus in the simplification of procedures – the objective is to ensure that the contracting authorities and the economic operators will not spend significant resources for preparing the tender documentation, the applications for participation and the bids. Regarding the rules for subcontractors, it should be guaranteed that SMEs that are subcontractors under public contracts are not subject to worse conditions than those for the main contractor.

A key hinder to SMEs' participation in public procurement cited in the studies mentioned above is the administrative burden. It is mostly related to the need to present a large number of documents proving competence to exercise professional operations and documents proving the availability of financial and technical capacity to implement the public contract. One of the key changes in the Directive (Art. 59) is the introduction of the European Single Procurement Document (ESPD).

Bobowski and Gola (2018) view the ESPD as the main instrument for the computerisation of the public procurement system. The European Commission has developed a free electronic service for filling out the ESPD, which is available to all contracting authorities and economic operators (applicants and participants). The filled-in online form can be exported and sent electronically. Furthermore, the information entered in ESPD, if relevant, can be used multiple times for participation in subsequent procedures.

In essence, ESPD acts as a substitute for the submission of a set of documents proving the financial status, technical capacity and professional competence of the economic operators. ESPD has significantly simplified the administrative requirements during the selection stage, because these documents now need to be submitted only by the entity the public contract is awarded to. As Pavlova (2017) noted, by the introduction of the generally new approach, the actions performed by the economic operators at the selection stage of the tender procedure are narrowed down to filling out and submission of a self-declaration form. The main purpose of the ESPD introduction is to decrease the alternative and transaction costs associated with the participation in the public procurement procedures, i.e. this has a direct impact on the resources spent (time and money). Certainly, ESPD considerably simplifies the efforts for preparation and submission of the applications for participation and/or the bids and it is believed that this is particularly important mainly for SMEs (SIGMA, 2016). Although there are studies (Telles, 2017) indicating certain problematic areas in the application of ESPD, it cannot be denied that it has introduced significant changes in the method of conducting public

procurement procedures and that it has contributed considerably for their simplification through the established pan-European standard information.

In addition to reducing the volume of work, ESPD has two more purposes, according to Telles (2017): indication of the place where the original documents are located; and providing information about the databases where the necessary information can be obtained. A third purpose that has been identified is directly related to eCertis.

The purpose of the eCertis electronic system is to support both the contracting authorities and the economic operators in the identification of the different types of documents certifying the minimum requirements to be met by the applicants and/or participants in the different member states, including Turkey as an applicant country and the three countries from the EEA/EFTA (Iceland, Liechtenstein and Norway), during the selection stage of the public procurement procedures. The system was created by the European Commission as a free online tool at the end of 2010. At the time of its launch, member states were not obliged to update the information in it, however, this is what the system reliability depends on. Therefore, Directive 2014/24/EU introduced rules, by virtue of which the relevance of the information about the different types of certificates, declarations and other documentary evidence should be guaranteed. The national authority responsible for the maintenance and updating of the information collected and stored in eCertis under the Public Procurement Act adopted in 2016 is the Public Procurement Agency (Art. 229(1)(25) of the Public Procurement Act).

The introduction of the requirement to ensure the relevance of the information in eCertis allows to develop the full potential of the system for simplifying the award process and for facilitation of the compatibility between the documents issued by the different member states. In fact, the service is particularly useful for economic operators that participate in procedures outside their country of establishment. In the cases of cross-border contract award, where they are not familiar with the requirements of the relevant country, the system offers a convenient mechanism to inquire about the types of documents and to obtain information about their content. The eCertis system undoubtedly helps simplify the award process. It is often referred to as a measure that facilitates SMEs' participation on the public procurement market (SIGMA, 2016; European Commission, 2018), however, in our opinion, its role in supporting SMEs is highly overrated. Despite the possibilities provided by this online tool that were already discussed, we believe that one of the challenges SMEs are faced with in the case of cross-border public contracts is the language barrier - the documentation for participation and, respectively, the application form and the bid should be written in the official language of the respective country. This is supported by the analysis in a study on cross-border penetration in the EU public procurement market (European Commission, 2021), where several possible ways to overcome this barrier have been outlined.

The two elements discussed (ESPD and eCertis) are at the core of e-procurement. According to a study of Alomar and de Visscher (2019), the most important factor for the adoption of e-procurement by the SMEs are the enabling conditions. Replacing the paperwork procedures by communication and processing based on digital technologies is a prerequisite for the rationalisation, simplification and facilitation of the procedures. The requirements introduced by Directive 2014/24/EU can be summarised in the following three groups: (1) electronic submission of communication; (2) electronic accessibility of the documentation, and (3)

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electronic submission of applications for participation and bids; however, these are not sufficient (European Commission, 2017). Only with the digitalisation of the entire process, including electronic processing and evaluation of the bids, invoicing, payment and archiving, maximum benefits can be derived. The mandatory introduction of e-procurement and its subsequent upgrading has undoubtedly contributed to increased transparency and efficiency of the public procurement procedures, it has reduced the administrative costs and has made the process relatively quicker. This helps increase the trust in the system and encourages an increasing number of economic operators, including SMEs, to take part and compete on this market. It should be noted that this would be only possible, if no barriers limiting the access to the system are allowed during the design stage of the e-procurement system (SIGMA, 2016). This is why the Directive requires that "the tools and devices to be used for communicating by electronic means, as well as their technical characteristics, shall be nondiscriminatory, generally available and interoperable with the ICT products in general use". All conditions for full digitalisation of the public procurement process were created with the development and introduction of the centralised automated information system "Electronic Public Procurement" in 2020, which includes electronic submission of bids and their automated evaluation, award of contracts and monitoring of the contracts implementation, as well as connection to electronic payment systems. This has certainly allowed SMEs operating on the Bulgarian market to fully benefit from the digitalisation, which, on the other hand, resulted in an increased interest on their part and participation in the public procurement procedures.

Objectively, the main hinder for SMEs' participation on the public procurement market is related to their relatively more limited administrative, technical and financial resources. In addition to the digitalisation of the public procurement process, which primarily addresses the administrative capacity of economic operators, the new regulatory framework introduced certain measures, such as dividing the public contracts into lots and changing the selection criteria. The minimum turnover required is precisely specified by introducing the rule that it should not exceed twice the estimated public contract value. This limits the ability of contracting authorities to set requirements for the economic operators' financial status that are disproportionate to the volume of the contract and eliminates one of the barriers to SMEs' participation on this market.

The contract division into lots can be either on a quantitative or qualitative basis. It should be noted that the Directive does oblige the contracting authorities to divide the contract into lots, but introduces the formula of "split or explain" instead. Because this is not a mandatory measure and considering the savings that could be generated from the economies of scale, contracting authorities are not motivated to divide the contracts into lots. Furthermore, the Directive encourages joint procurement, which means that the contracting authorities will attempt to work with a smaller number of contractors under contracts of larger amounts, thus putting SMEs at a disadvantage and favouring larger companies. Considering the conflict between the approaches for division into lots and the joint procurement, we completely agree with Anchustegui (2016), who believes that this measure is devoid of content. Therefore, it should not be expected that this will lead to the desired effect and make public procurement more accessible for SMEs in the absence of additional stricter regulations.

The measures discussed above (ESPD, eCertis, e-procurement, financial status requirements and division into lots) that are designed to support SMEs are available and have been applied over the past five years. We should mention that in a survey conducted by Flynn μ Davis (2016), the contracting authorities shared that the level of application of part of the measures is high, while others, such as division of the contracts into lots and encouraging the participation of consortia, which lead to higher transaction costs, have been rarely applied by them. As part of the same survey, they have discussed and provided specific recommendations on how to improve the implementation of those measures.

4. Research Results about the State of Public Procurement and SMEs in Bulgaria

In order to review and outline the trends and specifics of the public procurement market in Bulgaria, secondary data from the Open Data Portal and the Public Procurement Register, covering a five-year period from 2016 to 2020, have been used. Several indicators have been analysed, which characterise the market as a whole – total number of contracts signed; total value of the contracts signed; number and value of the public contracts funded by the European Union. Because the barrier that is most commonly mentioned as a hinder to SMEs' access to public procurement (Loader, 2018) is the size of the contracts, the trends in the average value per contract have been analysed. Due to the lack of publicly available data related to SMEs' participation on the public procurement market, no other indicators have been analysed.

During the studied period, there has been a clear tendency for a gradual increase in the number of contracts awarded (Table 1), with an annual average growth rate of 1.036. While the increase over the first 4 years (2016-2019) has been relatively gradual – by 2% per year, a significant increase was noted in 2020 – there was an increase of 7% as compared to the previous year, or an increase of 1664 units. It is striking that the absolute increase in the number of contracts awarded in 2020 as compared to 2019 (an increase by 1664 contracts) is a little higher than the total increase in the number of contracts awarded for the previous 4 years in total (an increase by 1587 contracts). This increase may be the result of the increased number of public procurement procedures or of the increased number of public contracts for different lots for the same number of public procurement procedures.

Table 1

Number of contracts awarded as a result of public procurement procedures held over the period 2016-2020

Year	2016	2017	2018	2019	2020
Total number of contracts awarded	21 505	21 882	22 486	23 092	24 756
Total number of contracts with European funding awarded	1484	2658	2764	3037	2983

Source: Open Data Portal https://data.egov.bg/ and Public Procurement Register https://app.eop.bg/today.

Regarding the "Number of public contracts funded by the European Union" indicator, there has been a gradual increase in the absolute values with almost 3000 contracts in 2020, which is, practically, twice as high as the value in the base year 2016. It should be noted that the annual average growth rate of the number of contracts funded by the European Union (1.19) is higher than the annual average growth rate (1.036) of the total number of contracts

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awarded. With the exception of 2016, the relative share of the number of awarded contracts with European funding in the total number of contracts remains relatively steady and varies between 12% and 13%.

Regarding the total value of the contracts awarded (Figure 1), there has been an increase over the first 4 years of the studied period, with a little over 2.2 times increase in 2019 as compared to 2016. In 2020, a lower total value of the contracts awarded as compared to 2019 had been reported, however, the total sum of the contracts awarded (BGN 12 373 million) remains above the average level for the period (BGN 10 212 million). The average value per contract over the period 2016–2020 is BGN 445 thousand, with a steady trend of growth reported for this indicator. The peak was reached in 2019, when the average value per contract was BGN 664 thousand. The increased total value of the contracts awarded. The levels of the average value per contract show that the increase in the contracted amounts as a result of the procedures held has outpaced the increase in the number of contracts awarded.

Figure 1

Value³ of the contracts awarded as a result of public procurement procedures held over the period 2016-2020



Source: Open Data Portal https://data.egov.bg/ and Public Procurement Register https://app.eop.bg/today and calculations made by the author.

There is a clear trend for an increase both in the total value and the average value per contract with European funding. At the beginning of the studied period, 13% of the value of contracts awarded was from contracts where the source of funding was a European fund or programme. At the end of the period, the share of contracts with European funding reached 25% of the total value of the contracts awarded. It is clear that the average growth rate of the total value of contracts with European funding (1.37) has substantially outpaced the average growth rate of the total value of the total value of all contracts (1.15). During all years covered by the study, the average value per contract with European funding is significantly higher than the average value of all

³ Values in foreign currency have been calculated based on BNB's currency exchange rate as of 31 December of the respective year.
contracts. In 2020, this value was a little over BGN 1 million as compared to an average value of all contracts of BGN 500 thousand.

These data allow us to draw several conclusions about the public procurement market. During the studied period, there has been a dynamic development, with a significant increase reported both in the number (from 21 505 to 24 758) and value (from BGN 6 943 million to BGN 12 373 million) of the contracts awarded. It can be assumed that this is the result of the higher demand, which is mainly due to the increased amount of public spending. The increase, both in the total number of contracts and in the higher average value per contract, is the result of the procedures funded by the European Union. Based on the identified causal relationship, we can argue that European funding is a key factor for the development of the public procurement market. There has been a significant increase both in the average value per contract (from BGN 323 thousand to BGN 500 thousand) and in the average value per contract funded by the European Union (from BGN 607 thousand to BGN 1077 thousand). This gives us the ground to conclude that the access of Bulgarian SMEs to public contracts remains quite limited, because the implementation of contracts of high value, as a rule, requires considerable financial capacity and liquidity, which SMEs do not have at their disposal. Despite the measures undertaken to encourage SMEs' participation on the public procurement market, this common barrier not only remains a challenge, but seems to become increasingly difficult to overcome. The trend described above in relation to the average value of a contract awarded after a tender procedure allows us to conclude that the public procurement reform does not have the expected effect on the business of Bulgarian SMEs. The level of their participation in the public procurement market remains inadequate given their market share. It can be assumed that this gap will widen in the next few years.

In order to determine the attitude of Bulgarian SMEs toward public procurement, a survey based on the voluntary response method was held in November 2021. An electronic self-completion questionnaire was used, which included a total of 33 questions divided into three blocks. Two types of data were collected: facts about the activity and experience on the public procurement market and opinions on the public procurement system. The responses to the questions about the barriers to participation in tender procedures as well as the evaluation of the system after 2016, were of particular interest with a view to the problems discussed in this article.

The respondents' can be defined as SMEs based on their profile, since more than 90% of them stated that their number of employees is less than 250 and 95% had a turnover not exceeding EUR 50 million. Regarding the questions about experience with tender procedures over the past two years, a little over 60% of the respondents stated that they regularly search for information about calls for tenders and apply for such procedures, while only 14.7% have never been contractors under public contracts. Regarding the barriers faced by Bulgarian SMEs, meeting the selection criteria turns out to be an important factor.

One of the most serious difficulties, hindering participation that is mentioned in the survey is meeting the selection criteria. Despite the existing possibilities to overcome this barrier by creating a consortium or participation as a subcontractor, it is striking that a high percentage of the SMEs (71%) stated that they have never been members of consortia and 77.6% of them have never been subcontractors under public contracts.

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In contrast to the studies of the barriers for SMEs cited above, which argue that the main barriers are the costs and time for preparing a bid, as well as difficulties communicating with the contracting authorities, the Bulgarian SMEs that took part in this survey declared that the main barrier they are faced with is related to the delay in payments under the awarded contract.

Most respondents believe that public procurement procedures have become more transparent, more simplified and more accessible for SMEs after the reform in 2016, they also mention certain serious drawbacks of the system. According to them, the public procurement process does not result in the best cost-benefit ratio, participants are not equally and fairly treated and the selection criteria are disproportionate to the subject, complexity and volume of the public contract. They believe these drawbacks are related to the sense of manipulated procedures, preliminary arrangements and a sense of the presence of corruption.

Although measures to support and encourage SMEs' participation on the public procurement market have been proposed and introduced over the past few years, data about the market in Bulgaria show that there have been some changes, but yet, the challenges remain present. The reasons for this situation are twofold:

- 1) the contracting authorities are not motivated to implement those measures;
- SMEs do not trust the procurement process and are reluctant to participate in public procurement procedures.

Ghossein, Islam and Saliola (2018) come to the conclusion that more companies, including SMEs, will be willing to participate in tender procedures in economies where good public procurement systems are available and, in the presence of effective competition, a price that is 20% lower than the one agreed under collusions (Anderson, Kovacic, 2009) can be achieved. This means that overcoming the current drawbacks of the public procurement market in Bulgaria with respect to SMEs will certainly yield significant benefits.

5. Conclusion

The study offers an analysis of the reforms undertaken in the Bulgarian public procurement system in recent years to encourage the participation of SMEs in this market, and the results lead to the following conclusions:

First, contracting authorities view and perceive public procurement as an administrative procedure, rather than a strategic policy-making tool. This could be overcome by the identification of clear strategic objectives for the development of this sector. Although the main objective of the national strategy for the period 2014-2020 is related to increasing the effectiveness, SMEs are not part of it.

Second, currently, there is no strategic document outlining the vision for development of the sector. It is not clear whether there is any such document under development or planned for the future. Undoubtedly, a more targeted and focused approach with respect to SMEs can be adopted through the development and endorsement of a national strategy or action plan that reflects their key significance for economic development. Based on the experience in other

countries (such as Great Britain), the share of public spending awarded to SMEs as a result of public procurement procedures can become a national target. This target could be specified by sectors or types of contracting authorities. In order to evaluate the effectiveness of a certain policy, its results need to be monitored and measured.

Third, it is necessary to also create a mechanism for the collection of reliable data about SMEs' participation on the public procurement market and use this as a basis for regular review of the policies followed. Where necessary, those instruments should be improved and upgraded.

Forth, both the data from the survey and the other studies on the subject matter come to the conclusion that there is a lack of trust in the Bulgarian public procurement system, which is partly the result of the perceived lack of transparency, general unfair treatment and corruption. Undoubtedly, public contracts are a high-risk sphere with respect to corruption.

Fifth, the digitalisation of the procurement process is a key instrument for combatting this trend. At present, all the conditions for complete digitalisation in Bulgaria are present and e-procurement is already a fact, but are SMEs sufficiently aware of that? Gaining their trust can start by improving the communication between the responsible institutions and economic operators with a focus on SMEs. Reaching the target audience and communicating all measures undertaken, including e-procurement, will not only increase their awareness, but will also show the institutions' commitment to involve them in the public procurement process. Attracting more participants on the market, particularly SMEs, will translate into bids of higher quality and, therefore, better efficiency of public spending.

Sixth, over the past years, there has been active and consistent policy-making in the EU focusing on improving SMEs' access to public contracts. While most European countries have marked some progress, we could hardly claim that these policies are effective and lead to the desired results in Bulgaria.

Seventh, it is recommended to make additional efforts to implement national initiatives and actions to increase efficiency in the public procurement market and improve the performance of SMEs.

These findings include some important indicators of the state of the Bulgarian public procurement system and the participation of SMEs in this market. Therefore, future research could focus on analysing a longer period and on the main guidelines for its further development.

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Volume 31(6), 2022

AUDIT PARTNER CHARACTERISTICS AND REAL EARNINGS MANAGEMENT PRACTICES IN JORDAN⁴

The financial scandals that occurred of late have raised concerns on the effectiveness of external audit in restricting earnings management. Also, audit failure in the capital market has led to augmented concerns towards audit quality. In addition, an external audit considers an external monitoring mechanism in which "independent" auditors carry out audits on a firm's internal controls and financial reports and provide their opinions to the company's owners. Besides that, the external audit is expected to deter the management from managing earnings. Thus, this study explores the effect of the individual attributes of the audit partner on real earnings management practices in Jordan. To do so, data from 58 ASE-listed companies were analysed for six years, i.e., from 2013 to 2018. The results indicated that audit partner tenure and REM are positively and significantly related. Furthermore, audit partner affiliation was found to be negatively and significantly associated with REM. Meanwhile, audit partner age and educational background were shown to have no effect on REM. The findings of the current study have implications on investors, regulators, and market participants by affording a considerable indication that the attributes of audit partners are very crucial in explaining the REM activities.

Keywords: External audit; Audit partner characteristics; Real earnings management; Jordan; Amman stock exchange. JEL: G30; M41; M42

1. Introduction

The downfall of respectable firms such as Enron in 2001 and WorldCom and Arthur Andersen in 2002 has drawn attention to the accurate and fair presentation of financial

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⁴ This paper should be cited as: Alhmood, M. A., Shaari, H., Al-dhamari, R. (2022). Audit Partner Characteristics and Real Earnings Management Practices in Jordan. – Economic Studies (Ikonomicheski Izsledvania), 31(6), pp. 185-200.

statements and monitoring (Leventis, Dimitropoulos, 2012). In this regard, reliability is crucial because financial information offered by financial reports is a significant source of decision-making for investors, while financial scandals have robbed the confidence of investors towards the accuracy of the information provided by listed companies (Liu, 2012; Alsraheen, Saleh, 2017). Within such context, earnings management is interpreted as any activity purposely conducted by managers of the company to disclose accounting results that are not in line with those actually obtained for opportunistic or informative purposes (Bermejo-Sánchez, Rodríguez-Ariza, Martínez-Ferrero, 2015; Osma, Noguer, Clemente, 2005).

Users of financial statements are frustrated by the many global accounting scandals caused by auditors' mistakes (Nawaiseh, 2015). The Jordan Institute of Certified Public Accountants (JACA) pointed out in a report released in 2014 that Jordan's audit quality is weak, and that there is a clear increase in tax evasion cases involving many Jordanian companies (Alsmairat, Yusoff, Salleh, 2018). Furthermore, in 2018, JACPA dismissed nine external auditors because of manipulations in issuing audit reports and tax evasion cases in many listed Jordanian companies (Khaberni, 2019). Nevertheless, the external auditor is in charge of ensuring that financial reports are issued in compliance with accounting standards and that the actual financial condition and the operating results of these statements are reflected (Nawaiseh, 2016). Thus, a high-quality audit is anticipated to limit opportunistic earnings management, and highlight hazards in financial statements such as material misstatements or exclusions (Alzoubi, 2016).

Therefore, financial scandals that occurred of late have raised concerns about the effectiveness of external audit in restricting earnings management. In addition, these scandals in Jordan and other regions all over the world have highlighted the importance of corporate governance for monitoring and controlling the work of corporate managers. In addition, external auditing is a mechanism of external governance in which an 'independent' auditor examines a company's internal controls and financial statements and presents an opinion to the owners. Thus, the risks and any errors that the auditor must notify the shareholders in the financial statement serve as the controlling mechanism for the company's management. In short, external audit is expected to deter the management from managing earnings (Rajpal, Jain, 2018).

Researchers have started to concentrate on business-related interactions of audit partners based on the amount of knowledge, experience and expertise of audit partners working with customers in a particular sector (Chi, Pevzner, 2011). Additionally, many researches on the conduct of individual auditors revealed that differences between auditors and their distinct characteristics affect their cognitive behaviour and audit quality (Liu, 2017).

2. Background and hypotheses development

The agency theory underpins the function of external auditing in enhancing the processes of financial reporting (Kharuddin, 2015). An external audit is a critical tool for monitoring activities so as to maximise company value (Jensen, Meckling, 1976). In particular, an external audit reduces information asymmetry between the shareholders and the managers

and enhances the credibility of financial information provided to shareholders, therefore limiting opportunistic management behaviours such as earnings management (Kharuddin, 2015; Lin, Hwang, 2010; Watts, Zimmerman, 1990). In addition, auditors are primarily responsible for fostering transparency in financial reporting systems, resulting in high-quality accounts. Thus, stockholders and creditors rely on the external auditor to ensure that a firm's financial statement is not deceptive (Abu siam, Hidayah, Khairi, 2014; Saleem, Alifiah, Tahir, 2016).

Previous literatures indicated a number of variables that could influence the ability of the external auditor to reduce earnings management activities. These include the reputation of an external auditor, the tenure of the external auditors, industry specialisation, external auditor opinions, and a change of the external auditor (Mariani, Tettamanzi, Corno, 2010; Al-khabash, Al-Thuneibat, 2009; Piot, Janin, 2007; Al-Hayale, Lan, 2005). However, many researches have shown that audit partners with shorter tenure are related to lesser earnings quality compared to audit partners with longer tenure (e.g., Van Johnson et al., 2002; Myers et al., 2003; Ghosh, Moon, 2005; Litt, Sharma, Simpson, Tanyi, 2014; Lennox, Wu, Zhang, 2014).

Furthermore, previous studies have also suggested that higher-quality auditors lead to a decrease in the practices of EM (Becker, Defond, Jiambalvo, Subramanyam, 1998; Van Johnson, Khurana, Reynolds, 2002; Balsam, Bartov, Marquardt, 2002). In contrast, Nawaiseh (2016) examined the auditor's tenure and EM relationship for Jordanian banking firms. He found that audit tenure had a negative relationship with earnings management. Meanwhile, Garcia-Blandon and Argiles-Bosch (2017) investigated the influence of audit partner tenure on audit quality using discretionary accruals as audit quality proxy. Using data for a Spanish firm from 2005 to 2011, the findings showed that audit partner tenure is not significantly related to the determinants of audit quality. Based on the arguments above, this study postulates the following hypothesis:

H1: A relationship exists between the tenure of audit partners and real earnings management in Jordanian companies listed on the ASE

Many researches have used auditor affiliation to Big 4 audit firms as a proxy for the quality of audit. Generally, results showed that Big 4 auditors had many opportunities to perform high-quality audits, including protecting their clients and reputations. A big auditing firm will have more motivation to detect management fraud because a Big 4 company's credibility would suffer if an audit goes horribly wrong (Vander Bauwhede et al., 2003; Rusmin, 2010). Hence, auditors affiliated with Big 4 firms will want to be operative in mitigating the practices of earnings management to protect their credibility and evade legal liability (Alzoubi, 2016).

More recent evidence has also shown that Big 4 audit firms oblige earnings management (Habbash, Alghamdi, 2017). Also, the literature review shows that companies audited by Big 4 audit firms have better quality accounting information than those audited by low-level audit firms and are less likely to manipulate earnings (Lee, Lee, 2013). This is because high-performance audit firms detect and constrain earnings management activities (Rusmin, 2010; Al-Dhamari, Chandren, 2017).

Some studies have revealed that Big 4 audit firms help to mitigate EM practices. For instance, Lin and Hwang (2010) found that Big 4 auditors are significantly and negatively related to EM. Jordan et al. (2010) examined whether audit quality, measured by auditor size, could limit the practices of EM. They revealed that earnings manipulation was less likely to occur in firms audited by Big 4 auditors, while non-Big 4 clients showed signs of manipulation (Habbash, Alghamdi, 2017).

In the Jordanian context, Alzoubi (2016) showed that for Big 4 audit firms, the association of auditor quality with EM was negative and significant. He concluded that the level of earnings control for companies employing Big 4 auditors was significantly lower relative to companies hiring non-Big 4 auditors. In contrast, Nawaiseh (2016) found that affiliation with big international auditing firms had a significant and positive relationship with earnings management. In contrast, Habbash and Alghamdi (2017) found that the relationship between auditors affiliated to Big 4 audit firms and EM is insignificant. Due to the previous results, this study posits the following hypothesis:

H2: A relationship exists between audit partners affiliation (with Big 4 and non-Big 4 firms) and real earnings management in Jordanian companies listed on the ASE

Furthermore, theoretical studies have indicated that workers' job interests are increasingly feebler as they become older, rendering older workers to expend less effort (Holmstrom, 1999). Thus, a negative relationship between partner age and audit quality was documented by Sundgren and Svanstörm (2014). Likewise, Goodwin and Wu (2016) exposed that EM is related to older partners. The results are in line with the argument that older partners provide lower quality audits.

In addition, Widiarta (2013) clarified that the individual factor of age influences the professionalism of auditors. Moreover, Wirosari and Fanani (2017) demonstrated that it becomes more conservative to obtain evidence to lower the risk when the auditor gets older. In contrast, Yudi and Rahayu (2019) found that the age of the auditor does not affect the quality of audit reports. Due to the previous argument and the limited research on this issue, this study posits the following hypothesis:

H3: A relationship exists between the age of audit partners and real earnings management in Jordanian companies listed on the ASE.

Moreover, the audit literature examination on the relationship between the partners' educational characteristics (like accounting major and degree level) and audit results revealed inconsistent findings (Lennox, Wu, 2017). In this context, researchers are encouraged to investigate the relationship between the knowledge of the individual auditor and the quality of an audit (DeFond, Zhang, 2014). It was found that auditors who are more knowledgeable about the tasks are more effective after the effort was reduced. Still, they may find more errors and are more willing to incorporate new knowledge, such as those about test procedures (Che, Langli, Svanström, 2017).

Gul, Wu and Yang (2013) and Knechel, Vanstraelen and Zerni (2015) found that auditors with varied risk preferences, educational qualifications and skills, and these personal characteristics may have major effects on the outcome of an audit engagement. Recently, Che et al. (2017) linked the education background of the audit partner to audit quality and

found that Chinese auditors holding a post-graduate degree reported more vigorously than others without.

In contrast, Setyaningum (2012), Cahan and Sun (2015), Li et al. (2017) and Yudi and Rahayu (2019) found that education or educational background does not affect audit report quality. The review demonstrated mixed results. This current study aims to investigate this relationship to find new evidence about this issue. Thus, due to the mixed findings, the current study posits the following hypothesis:

H4: A relationship exists between the educational background of audit partners and real earnings management in Jordanian companies listed on the ASE

3. Methodology

3.1 Sample and Data

The Amman Stock Exchange listed companies are categorised into three sectors namely the service, industrial and financial sectors. As of 2019, the service sector consists of 47 listed companies, while the industrial and financial sectors consist of 48 and 96 listed firms, respectively (ASE, 2019). This study focuses on the service and industrial sectors and firm-year observations of six years (2013-2018). Hence, the total size sample in this study is 570 observations (95 firms multiplied by 6 years). This study excluded the financial sector because it is bounded to the regulations set by the Insurance Commission and Central Bank of Jordan. Moreover, firms without cost of goods sold and inventory, as well as firms with missing data, were also removed from the study. Hence, the final firm-year observation in this study involves 348 firms (15 service firms and 43 industrial firms multiplied by 6 years).

The data used in this study are secondary data which were manually collected from the annual reports to achieve the objectives of the current study. The audit partner characteristics data were collected by e-mail from JACPA.

3.2 Variables Measurements

3.2.1 Dependent Variable (REM)

This study measured REM following the model introduced by Zang (2012), which entails abnormal production cost, i.e., increasing income costs by dropping the overproduction costs for inventory, and abnormal discretionary expenses, i.e. decreasing discretionary expenditures, which include a total of administrative expenditures, advertising, sales and R&D. This study also measured REM by estimating the residual values of PROD and DISEXP for each year and industry. The REM model was used in this study to detect the manipulation of real activities by the managers. Roychowdhury (2006) developed the REM measurement, which reflects the economic impact of manipulating real activity. According to Zang (2012), managers engaged in inventory overproduction in order to reduce the cost of goods sold by increasing excess investment. Managers may also use their discretion to reduce discretionary expenses in order to boost earnings.

This study follows the study of Zang (2012) in estimating the normal level of production costs which is the sum of the cost of goods sold (COGS) and changes in inventory. The model is as follows:

 $COGS_{it} / Assets_{it-1} = \alpha_0 + \alpha_1 \left[\frac{1}{Assets_{it-1}} + \beta \left[Sales_{it} / Assets_{it-1} \right] + \varepsilon_{it} \right]$ (1)

Then, the changes in inventory are estimated as follows:

 $\Delta \text{ Inv}_{it} / \text{ Assets }_{it-1} = \alpha 0 + \alpha 1 [1/\text{ Assets it-1}] + \beta 1 [\text{Sales it} / \text{ Assets it-1}] + \beta 2 [\Delta \text{ Sales it} / \text{ Assets it-1}] + \varepsilon_{it}$ (2)

Where Δ Inv is the changes in inventory in period t. Using equation 1 and 2, the normal level of production is estimated as follows:

PROD _{it}/Assets _{it-1} = $\alpha_0 + \alpha_1 [1/Assets_{it-1}] + \beta_1 [Sales_{it}/Assets_{it-1}] + \beta_2 [\Delta Sales_{it}/Assets_{it-1}] + \beta_3 [\Delta Sales_{it-1}/Asset_{it-1}] + \varepsilon_{it}$ (3)

Where PROD is the sum of the cost of goods sold in year t and the change in inventory from the previous year (t - 1) to the current year (t); Assets_{it-1} is the total assets in the previous year (t - 1); Sales_{it} is the net sales in the current year (t); and Δ sales_{it} is the change in net sales from the previous year (t - 1) to the current year (t).

The measurement of PROD (abnormal production cost level) is the residual of equation (3) as stated above. The higher PROD indicates real activity manipulation through overproduction, resulting in a reduction of the cost of goods sold.

In addition, following Zang (2012), the normal level of discretionary expenditures is estimated as follows:

DISEXP it / Assets it -1 = $\alpha_0 + \alpha_1 (1 / \text{Assets it -1}) + \beta_1 (\text{Sales it -1} / \text{Assets it -1}) + \epsilon_{it}$ (4)

Where DISEXP_{*it*} is the sum of selling, general, and administration expenses in year *t*; Assets_{*it*-1} is the total assets in the previous year (t-1); Sales_{*it*} is the net sales in the current year *t*; and Δ sales_{*it*} is the change in net sales from the previous year t-1 to the current year (t).

The residual error of the regression estimate is used to measure the abnormal discretionary expenditure (DISEXP). The residuals are multiplied by -1 so that the higher values indicate that the company deducts more discretionary expenses to increase reported earnings. In this study, REM is calculated as a summary measure of real activities manipulation. The calculation method is an abnormal discretionary expense (DISEXP) multiplied by -1 plus abnormal production cost (PROD) (Zang, 2012).

3.2.2 Independent Variables

While the measure of the dependent variable was shown in the previous section, a detailed discussion of the measure of the independent variable used in this study is discussed in this section. As revealed in Table 1, the independent variables are audit partner tenure, audit partner affiliation (Big 4 firm or not), audit partner age and audit partner educational background, while the control variables used in the current study are FSIZE, FINLEV, MTB, ROA and SGRWTH.

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Table1

Variable	Measurement	Source					
Dependent variable							
REM	REM= PROD + DISEXP * -1	Roychowdhury, 2006; Zang, 2012					
	Independent variables:						
Audit partner tenure (APTEN)	Measured by the number of consecutive years a foundation has been audited by the same auditor	González-Díaz, García-Fernández, López-Díaz, 2015; Ellis, Booker, 2011					
Audit partner affiliation (APAFF)	measured by one if the audit partner is working in a Big 4 audit firm if otherwise 0	Azibi, Rajhi, 2013					
Audit partner age (APAGE)	measured by one if the audit partner \ge 49 years old, and 0 if less	Sundgren, Svanström, 2014					
audit partner educational background (APEDUB)	measured by one if the audit partner has a post-graduate degree in accounting, and 0 if otherwise	Ocak, Ntim, 2018; F. A. Gul, Wu, Yang, 2013; Che et al., 2017					
	Control variables						
Firm size (FSIZE)	measured as the natural logarithm of total assets	Becker et al., 1998; Myers et al., 2003, Ashbaugh et al., 2003; Nagy, 2005; Abbott et al., 2006					
Financial leverage (FINLEV)	measured by dividing long-term debt by total assets at the ending of the year	Mao, Qi, Zhang, 2017					
The market-to-book ratio (MBVALUE) measured by the market value of equity at the end of the fiscal year divided by the book value of equity at that date		Zhang, Aerts, 2015					
Return on assets (ROA)	Measured as the ratio of net income to total assets	Gounopoulos, Pham, 2018					
Sales growth (SGRWTH)	annual sales growth (current year sales – prior year's sales)/prior year's sales	Al-rassas, Kamardin, 2017; Absy, Ismail, Chandren, 2019					

Table of Measurements

3.2 Model of the Study

In this research, the following regression model was developed and used to meet the research objectives:

 $REM = \beta 0 + \beta 1 AUDPARTEN_{it} + \beta 2 AUDPARAFF_{it} + \beta 3 AUDPARAGE_{it} + \beta 4 AUDPAREDUB_{it} + \beta 5 FSIZE_{it} + \beta 6 LEV_{it} + \beta 7 MTB_{it} + \beta 8 ROA_{it} + \beta 9 SGRWTH_{it} + \epsilon_{it}$

Where: REM = real earnings management, I = firm, t = year, $\beta 0$ = the intercept, ε = the error term, $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4...$ = the coefficients, AUDPARTEN = audit partner tenure, AUDPARAFF = audit partner affiliation, AUDPARAGE = audit partner age, AUDPAREDUB = audit partner educational background, FSIZE = firm size, MTB = market to book value, LEV = leverage, ROA = return on assets, SGRWTH = sales growth.

4. Empirical Results

4.1. Descriptive Statistics

Displayed in Table 2 and Table 3 are the total observations mean, standard deviation, minimum, and maximum values for all the employed variables. As displayed in Table 2, the mean value of PROD is 0.000, and this value is considered highly comparable to 0.001, which was the mean value documented in Huang, Roychowdhury and Sletten (2019), with -0.662 as the minimum value and 0.383 as the maximum value. For DISEXP, the obtained mean value is 0.000, and this value is regarded as highly comparable to the value of 0.004 documented in Huang, Roychowdhury and Sletten (2019), with -0.33 as the minimum value and 0.67 as the maximum value.

Besides that, REM scored a mean value of 0.000, and this value is highly comparable to the mean value of 0.004 documented in Huang, Roychowdhury and Sletten (2019), with -0.781 as the minimum value and 0.452 as the maximum value.

Table 2

Variable	Obs	Mean	Std.Dev.	Min	Max
PROD	348	0.000	0.122	-0.662	0.383
DISEXP	348	0.000	0.088	-0.33	0.67
REM	348	0.000	0.175	-0.781	0.452

The Descriptive Statistics of the Dependent Variable

Note: CFO = cash flow from operations, PROD = production cost, DISEXP = discretionary expenses, REM = real earnings management.

Table 3 presents the mean value of the audit partner's tenure, which is 3.04, with a maximum of 17 years and a minimum of one year. This result indicates that the average for AUDPARTEN is three years which is a shorter duration than the maximum audit partner tenure in the Jordanian Corporate Governance code, i.e., 4 years. Such a result is closely related to the mean of 3.17 reported by (Garcia-Blandon, Argiles-Bosch, 2017).

Moreover, according to Table 3, the mean value of audit partner affiliation is 0.454, indicating that 45% of audit partners in the study sample were affiliated with Big 4 audit firms. Comparatively, the value is lower than the mean value found by Alzoubi (2018) in the context of Jordan, i.e. 0.726. The reason for the lower mean score is that Alzoubi (2018) only emphasised on listed industrial firms and used a different period, i.e. from 2006 to 2012.

Table 3 also shows the maximum value of the audit partner's age, which is 85 years, while the minimum value is 34. Moreover, the mean of the audit partner's age is 53.376. Such a result implies that the average AUDPARAGE for the sampled firms is about 53 years. The result is higher than the mean of 45.558 documented in Goodwin & Wu (2016). Finally, Table 3 reveals that the mean of audit partner educational background variable is 0.664, indicating that about 67% of the audit partners of the sampled firms were post-graduate degree holders. This result is higher than the obtained mean of 0.193 recorded in Ocak and Ntim (2018) and 0.100 found by Che et al. (2017).

Table 3

Variable	Obs	Mean	Std.Dev.	Min	Max
AUDPARTEN	348	3.04	2.405	1	17
AUDPARAFF	348	0.454	0.499	0	1
AUDPARAGE	348	53.376	10.474	34	85
AUDPAREDUB	348	0.664	0.473	0	1
FSIZE	348	17.144	1.411	13.14	20.904
LEV	348	0.864	4.112	0.004	48.743
MTB	348	1.295	1.382	0.133	14.088
ROA	348	025	.848	-15.7	.605
SGRWTH	348	-0.028	0.265	-0.618	0.775

The Descriptive Statistics of the Independent and Control Variables

Note: AUDPARTEN = audit partner tenure, AUDPARAFF = audit partner affiliation, AUDPARAGE = audit partner age, AUDPAREDUB = audit partner educational background, FSIZE = firm size, LEV = leverage, MTB = market to book value, ROA = return on assets, SGRWTH = sales growth.

4.2 Main results

Prior to the experiment, the current research investigated if the model employed to explore the impact of audit partner characteristics on REM practices has econometric problems. When the correlations between the independent variables are greater than 0.90, the issue of multicollinearity arises (Hair et al., 2010; Tabachnick, Fidell, 2007). The multicollinearity issues were identified using Pearson's correlation (correlation matrix) in the current research. Table 4 displays that the highest value of correlation was between AUDPARAFF and AUDPAREDUB, with a coefficient of 43 percent. As a result, there was no issue with multicollinearity in the dataset used in this study's model.

Table 4

Correlations Matrix										
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) REM	1.000		_							
(2)AUDPARTEN	0.084	1.000		_						
(3)AUDPARAFF	-0.195	-0.189	1.000		_					
(4)AUDPARAGE	0.086	0.221	-0.263	1.000		-				
(5)AUDPAREDUB	-0.062	0.044	0.429	0.072	1.000		_			
(6) FSIZE	-0.054	-0.082	0.263	-0.278	0.098	1.000		-		
(7) LEV	0.084	-0.051	0.100	-0.043	0.095	0.371	1.000		_	
(8) MTB	-0.227	-0.024	0.287	-0.077	0.195	0.272	0.256	1.000		-
(9)SGRWTH	0.004	-0.055	-0.051	0.076	-0.075	-0.031	0.077	0.003	1.000	
(10) ROA	-0.283	0.046	0.122	-0.127	-0.001	0.082	-0.332	0.310	0.038	1.000

Note: REM = real earnings management, AUDPARTEN = audit partner tenure, AUDPARAFF = audit partner affiliation, AUDPARAGE = audit partner age, AUDPAREDUB = audit partner educational background, FSIZE = firm size, LEV = leverage, MTB = market to book value, SGRWTH = sales growth.

The results for the Driscoll–Kraay regression are shown in Table 5. The results show that the R^2 values of 0.127 for the model are fairly small when compared to the R^2 of 0.21 reported in Algatamin, Aribi and Arun (2017), while the R^2 value of the current study is too close to

the value of 0.139 reported in Alhadab, Abdullatif and Mansour (2020) in the Jordanian context. However, the values appear to be greater than the R^2 of 0.071, as documented in Ocak & Can (2018) among firms operating in Turkey. As can thus be stated, the overall model is fit in explaining the level of variability between the dependent and explanatory variables.

In Table 5, the results show that audit partner tenure has an association with REM, i.e. a significant and positive relationship (2.18, p<0.1). Therefore, H1 is supported. This result means that a longer tenure of the audit partner will increase REM. A possible explanation for this result is that the extension of the tenure of the audit partners in the same company will mean a closer relationship with the senior management, which means that auditors are less willing to challenge the decisions of the managers, making them less vigilant. This phenomenon can motivate the top management to be engaged in EM practices because the close relationship will give them the idea that the auditor will not detect their REM practices.

This result agrees with that of Litt, Sharma, Simpson and Tanyi (2014) and Lennox, Wu and Zhang (2014), but contradicts the agency theory, which suggests that the external auditor is among the most vital tools for monitoring the activities of decision-makers, which can limit REM practices. The possible reason behind this finding is that the long tenure of the CEO in this sample means that the Jordanian firms did not comply with the terms of the JCGC concerning the maximum tenure of the audit partner, i.e., 4 years.

Table 5 reveals a significant and negative relationship between audit partner affiliation and REM (t =-4.34, P< 0.01). Hence, H2 is supported. The negative coefficient means that the audit partner of the firm, which is controlled by Big 4 firms, might decrease REM practices. The result indicates that the decision-makers of the firms that are audited by Big 4 audit firms are less likely to engage in REM practices, as these firms anticipate that the high audit quality by the Big 4 audit firms may lead to the detection of any REM practices. Furthermore, Big 4 audit firms would have a greater level of incentives to detect management manipulation as they will be punished if an audit fiasco arises in the companies that they audit (Vander Bauwhede et al., 2003; Rusmin, 2010; Watts & Zimmerman, 1986). Big-firm auditors hence have more effectiveness in decreasing EM as it is important for them to preserve their reputation and avoid legal liability.

The result of the current study is in line with the context of Jordan as in Alzoubi (2016), who found that the degree of EM in firms that utilise the services of Big 4 auditors is significantly lower than in those that employ non-Big 4 auditors. As well, the result is in line with studies in other countries such as Singh, Singh, Evans (2019) and Che, Hope and Langli (2020). Such a result is in agreement with the agency theory, which stipulates the external auditor as among the most vigorous tools for monitoring the activities of decision-makers, which can put a limitation on the practice of REM.

Moreover, Table 5 indicates that there is an insignificant relationship between the audit partner's age and REM. Therefore, H3 is rejected. The possible explanation for this result is that REM is more mysterious and thus harder to detect (Cohen, Zarowin, 2010; Kothari et al., 2012). Therefore, due to REM's complexity and the sophisticated practices of PROD and DISEXP, the experience and skills that the audit partners obtained over their life may not be sufficient to detect such practices of REM. Another explanation as to why the audit partner's

age did not relate to REM practices is because the ability to identify such practices depends on superior skills and specific techniques, which could be gained through vocational training or professional certificates regardless of the age of the auditor.

This result contradicts the agency theory, which argues that the external auditor is among the essential tools for monitoring the activities of decision-makers that can mitigate REM practices. The finding is in line with Yudi and Rahayu (2019), who found that the age of the auditors is not associated with REM.

Furthermore, Table 5 reveals an insignificant relationship between the audit partner's educational background and REM. Therefore, H4 is rejected. The possible reason for this result is that REM is more impermeable and hence violations of financial reporting and accrual manipulations are more difficult to detect (Cohen, Zarowin 2010; Kothari et al. 2012). Therefore, due to REM's complexity and the complicated techniques of PROD and DISEXP, the knowledge that the audit partners gained from their educational background may not be enough to mitigate REM practices by the decision-makers of the firms. As previously stated, the auditor's ability to identify REM activities should be measured by his or her ability to think creatively and create alternate audit procedures in order to detect potential audit fraud (Yudi, Rahayu, 2019). Furthermore, the audit partner's educational background appears not to have any linkage to REM practices because the ability to detect such practices requires superior skills and specific techniques which could not be gained through post-graduate degrees.

This result contradicts the agency theory, which presumes that an external auditor is an indispensable tool for monitoring the activities of decision-makers which in turn can limit the practices of REM. This result is consistent with that of Cahan and Sun (2015) and Yudi and Rahayu (2019), who found that the educational background of the auditor is not associated with REM.

Tal	ble	5

REM	Coef.	t-value	p-value		
AUDPARTEN	0.006	2.180	0.033**		
AUDPARAFF	-0.045	-4.340	0.000***		
AUDPARAGE	0.015	0.120	0.902		
AUDPAREDUB	0.004	0.390	0.698		
FSIZE	0.003	0.930	0.356		
LEV	0.046	1.080	0.286		
MTB	-0.019	-1.810	0.075*		
SGRWTH	0.000	1.430	0.158		
ROA	-0.433	-8.160	0.000***		
Constant	-0.055	-0.330	0.740		
Number of obs	348				
R-squared	0.1266				
Prob > F	0.000				

Results of the Linear regression

*** p<0.01, ** p<0.05, * p<0.1

Note: REM = real earnings management, AUDPARTEN = audit partner tenure, AUDPARAFF = audit partner affiliation, AUDPARAGE = audit partner age, AUDPAREDUB = audit partner educational background, FSIZE = firm size, LEV = leverage, MTB = market to book value, SGRWTH = sales growth.

5. Conclusion

This study examined the effects of four characteristics of the audit partner, namely tenure, affiliation (Big 4 firm or not), age, and educational background. Moreover, to understand the impact of the audit partner characteristics, two theories were used, namely the Agency Theory and the Stewardship Theory. Next, to test the assumptions of the current study and analyse the hypothesised relationships, the Driscoll–Kraay regression analysis using STATA software Version 15 was used.

The results that emerged from the present study indicated a significant and positive relationship between audit partner tenure and REM, which implies that a long tenure of the audit partner will increase REM. In relation to audit partner affiliation, the findings revealed that it is associated with REM negatively and significantly. This means that when the audit partner of the firm is affiliated with Big 4 audit firms, the decision-makers of the firms will be less likely to engage in REM practices.

Additionally, the result of the present study specified that there is an insignificant relation between the audit partner's age and REM. The results also revealed an insignificant relationship between the audit partner's educational background and REM. The explanation for the insignificant results is that the ability to identify such practices depends on superior skills and specific techniques that could be gained through vocational training or professional certificates regardless of the age or educational background of the auditor.

The findings of the current study offer a considerable indication that the characteristics of the audit partner are rudiments in explaining REM activities. Hence, the current study revealed that longer audit partner tenure leads to higher REM practices, whereby firms audited by the same audit partner for an extended period are more likely to have more REM practices. Thus, this study recommends for policymakers to pay attention to the commitment of Jordanian firms to audit partners with maximum tenure.

With respect to audit partner affiliation, the results reported that if the audit partner of the firm was affiliated with Big 4 audit firms, the prevalence of REM practices would decrease. Consequently, these results are beneficial to the users of financial statements in realising that firms audited by audit partners affiliated with Big 4 audit firms will have fewer REM practices.

Furthermore, the findings of the current study are significant for the academic community and researchers because of the lack of literature addressing the real earning management in the Jordanian context or in other developing countries. Thus, the current study improves the growing empirical research and body of knowledge on real earning management and motivates further studies on the relationship between the characteristics of audit partners and REM.

The results of this study are practical in finding a starting point for additional empirical investigations on the significance of the characteristics of the audit partners in listed Jordanian firms. The findings are also valuable for academic researchers in examining related issues, including earning reporting quality and corporate governance. Nonetheless, this study's findings are limited to non-financial businesses. As a result, more research should be

done on the financial sector, which is becoming increasingly important for emerging economies, especially Jordan. Besides that, the current study opens up an opportunity for future researchers to perform similar studies regarding the effect of other characteristics of audit partners on REM, such as gender, religion, and ethnicity.

Despite the contributions made by the present research, it is still subjected to several limitations. Specifically, a common and predictable deficiency is in the objections concerning the impeccable model for measuring earning management practices. To date, there is no perfect model generally accepted by scholars and practitioners. Hence, the models by Roychowdhury (2006) and Zang (2012) used in this study might not have captured all the streams of earning management. In addition, this study is limited to listed non-financial firms; consequently, due caution must be exercised in generalising the findings to all listed companies because other firms such as those in insurance, banking, and other regulated sectors had been excluded.

Nonetheless, the above limitations do not diminish the quality and contributions of the present study. Hence, the appropriate and precise method has been applied to accomplish the objectives of the study.

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SUMMARIES

Mariella Nenova

HOUSEHOLDS' CONSUMPTION PATTERN AND SAVING – EVIDENCE FOR THE FIRST YEAR OF THE COVID-19 PANDEMIC IN BULGARIA

Households' saving jumped up in 2020 as a response to the outburst of the Covid-19 pandemic. The objective of the paper is to analyse the mechanism behind the hike in households' saving through the changes in their consumption pattern. The analysis makes use of the households' budget survey annual data for the period 2008-2020 for Bulgaria. Households' downward adjustment in spending in 2020 followed the pattern of 2009-2010, but the reduction was more pronounced in expenditures on recreation, culture, and education (related both to the Covid-19 restrictive government measures and self-restrain from consumption caused by enhanced health risk) and spending on health (self-restraint). A supposition may be drawn that the enhanced health risk perception and self-restraint might contribute to a relatively elevated saving rate. Subdued consumption of services, most affected by Covid-19 restrictive measures, might sustain at least in the near future and slow down the overall growth rate. Policy measures to boost consumption, particularly of services, may be ineffective. Keywords: Covid-19; disposable income; consumption; saving; income elasticity of demand JEL: E21; E44; E52; I12; I18

Sonia Chipeva, Vania Ivanova

THROUGH CIRCULAR TO LOW CARBON ECONOMY – CONCEPT AND EVIDENCES IN THE EU MEMBERS

The aim of the study is to present an opportunity for the concept of circular economy to become a lever for the transition to a low-carbon and environmentally friendly economy. The correlation between key indicators for circular economy and change of GHG emissions in EU countries has been analysed, and a series of econometric models have been developed. An analysis has been conducted for 4 sets of countries – Bulgaria, the EU countries as a whole and the communities of old and new members separately. The existence of untapped opportunities related not only to more efficient use of resources, but also to the possibility of radical change in business models has been revealed in the analysis. The conclusions reached show that the concept needs to be extended so as to break the relation between economic growth and waste production, as well as the potential to reduce GHG emissions.

Keywords: circular economy; greenhouse gas emissions; sustainable production and consumption; recycling; EU

JEL: 013; 014; P28; Q01; Q52

Stanislav Zhiznin, Velislava Dineva

THE ROLE OF GAS INTERCONNECTIONS IN THE ENERGY SECURITY OF SOUTH-EAST EUROPE

The Russian-Ukrainian dispute over the natural gas transit and the subsequent disruptions in natural gas supply to some countries in South-East Europe (SEE) in 2006 and 2009 attracted considerable public and academic attention and it wouldn't be overstated to say that they have changed the direction of the entire energy policy of the European Union. Sixteen years after the first gas crisis, in

light of the current energy crises and the military conflict between Ukraine and the Russian Federation, this paper attempts to illustrate the trends in the natural gas sector development in South-East Europe, to evaluate whether and how the role of the Russian natural gas supplies in the region's energy security has changed and to examine what measures have been taken for the security of natural gas supplies in the region over the years. The results show that although the amount of Russian natural gas delivered to the SEE countries still represents the greatest share of their total gas supplies, concerns over possible disruptions have been addressed by developing the interconnectivity in the region and commissioning new infrastructure creating alternative options for the routes and sources of supply. Nevertheless, there is still what to expect in regard to interconnectivity and market integration of the Western Balkans.

Keywords: South-East Europe; Energy security; Security of Natural gas supplies; Economics of Natural gas sector; EU Energy policy

JEL: Q4; F5

Faruk Ahmeti, Burim Prenaj

DETERMINANTS AFFECTING CONSUMER ACCEPTANCE AND ADOPTION OF INTERNET BANKING IN DEVELOPING COUNTRIES: THE CASE STUDY OF KOSOVO

This paper aims to examine how the demographic characteristics affect the level and intention to use and the level of usage of online banking services in Kosovo. A self-administered survey was conducted with 600 questionnaires sent, from which 510 participants responded to it and were considered accurate and appropriate for the study. The data for this research started at the end of 2020 until the middle of 2021 and a probable stratified sample was used, whereas closed-end questions were prepared through a structured questionnaire. The study adopted the technology acceptance model with additional constructs (i.e. consumer innate innovativeness (II), domain-specific innovativeness (DSI), and perceived security risk (PR)). Results showed that even though the participants appreciated the benefits of online banking as the perceived usefulness factor exerts the greatest direct effect, they yet hesitate to fully adopt the online banking system. It is recommended that banks should develop an information campaign to inform their customers about the total effects of the perceived ease of use and the security related to the online banking system. The study is limited to users of a particular region of Kosovo, which should be further widened in future studies by including other countries from the SEE. Furthermore, the study limits itself in determining consumers' intention to acceptance of online services offered by banks in a pandemic situation and, as such, may be affected by the overall chaotic situation created in the given period.

Keywords: Internet banking; Demographic factors; Economic development; Developing countries; Customer behaviour

JEL: E20; E42; G14; G21; O33

Marica Antovska-Mitev, Tatjana Drangovska

DEVELOPMENT OF THE MACEDONIAN BUSINESS SECTOR AND ITS INNOVATION ACTIVITIES FROM THE EARLY TRANSITION YEARS UNTIL TODAY (1991-2021)

The paper provides a qualitative assessment of the development of the Macedonian business sector and its innovation activities from the early transition years until today (1991-2021). In this article, firstly is reviewed the development of the Macedonian business sector in the analysed period. In this section, special emphasis is placed on the number of active business entities, their sectoral distribution, the institutional infrastructure in the country to support the private sector, etc. Then, an analysis of the innovativeness of the Macedonian business sector in the early transition period and in the period after 2010 was made. In the paper, data related to the labour productivity of the enterprises are also analysed. The analysed data on the innovativeness and productivity of the Macedonian enterprises is compared with the European average. This analysis points to a significant lag in the Macedonian business sector in terms of innovativeness and productivity compared to the EU average. At the end of the paper, conclusions that summarise the weaknesses and achievements of the Macedonian business sector in the past 30 years are given and there are noted areas in which special action should be taken in order for the current situation to be improved.

Keywords: transition; privatisation; business sector; innovation; productivity. JEL: O3

Yulia Hristova

LIFE INSURANCE PENETRATION DRIVERS IN BULGARIA

The need for security and protection of human life and health is the very cornerstone behind life insurance demand which has become larger with the current COVID-19 atmosphere. Life insurance penetration is significantly lower in Bulgaria compared to the EU average, while studies on the subject of how this development came about are almost absent. In that regard, this article is focused on the influence of major macroeconomic, demographic and competitive factors over life insurance penetration in Bulgaria. When it comes to the methodological aspect, the study is based on the theory of demand and industrial organisation by applying the descriptive and correlation analysis methods. The results underline that despite the positive trends in life gross premiums, written for the period of 2009-2020, Bulgarians prefer to allocate their excess funds towards alternative investment opportunities. To a large extent, this is attributed to the low amount of income and the low productivity of the economy as well as because of the lack of effective competition between the small number of insurance companies. From the customers' point of view, this leads to a lack of awareness of the benefits of insurance, distrust and the absence of insurance interest, all of which are intensified during COVID-19. Responding to the market in relation to new business, supplying flexible, personalised and hybrid varieties of products, omni-channelling and development of positive attitudes among the population are all regarded as basic guidelines, used to improve insurance penetration. This article, therefore, serves as a foundation for a more in-depth study of the Bulgarian life insurance market, a stimulus for increasing the financial literacy of the Bulgarian populace and a subject of interest for insurance companies themselves in their fight to promote activity and to unleash market potential.

Keywords: life insurance; penetration; determinants; life insurance market JEL: G22; L10; M21

Theranda Beqiri, Adriatik Hoxha

PROPENSITY OF YOUTH TO MIGRATE: EVIDENCE FROM KOSOVO

This paper investigates the propensity of youth to migrate using the survey data from two universities in Kosovo. The logit model results suggest comprehensive and statistically robust evidence that migration propensity is negatively related to age. The respondents that have political concerns, that are against or indifferent to migration as a phenomenon, compared to those that support it, have indicated statistically significant negative migration propensity. Conversely, the data suggest that economic, cultural, and security variables are significantly and positively related to migration propensity. Moreover, the data suggests no statistically significant impact of gender, marital status, residence, employment, income, relatives' network, religion, and training, variables, on the migration propensity. The robustness of estimated results is supported by diagnostic tests. Finally, the fact that 59% of respondents have indicated a propensity to migrate, clearly emphasizes the seriousness of the migration challenge, and the consequential impact it may have on the future prosperity of the country. Keywords: migration; youth; propensity; logit JEL: F22; J61; O15

Nikolay Dragomirov

DIGITAL TRANSFORMATION PERSPECTIVES IN WAREHOUSING – INITIAL STEPS AND PROJECTIONS

Warehousing is an essential part of any logistics system, and warehousing activities are seen as a source of competitiveness. In the context of current trends in digitalisation and digital transformation, the problems concerning the usage of information systems and technologies in warehousing are expected to be in focus. The objective of the research paper is to summarise the level of digital transformation in the field of warehousing in Bulgarian trade and manufacturing enterprises, and on that basis to define some common perspectives. The study is based on data collected from a survey focused on warehousing management. The current article defines several discussion areas such as digital transformation and smart warehousing, knowledge about warehousing management, and the importance of warehousing software and consulting market potential.

Keywords: warehousing; digital transformation; IoT; information systems and technologies; software JEL: M15; M19; O31; O32

Tatyana Kicheva

EMPLOYEE ENGAGEMENT IN REMOTE WORK

Until 2020 organisations gave their employees the opportunity to work from home as a perk intended to provide for favourable working conditions. The spread of COVID-19 and the restrictions imposed by governments made organisations worldwide switch entirely and in a very short time to remote work where the nature of the job allowed it. In these new working conditions, organisations changed their policies and employee engagement became one of the most common issues in recent research. This article is aimed to study employees' attitudes of engagement with their organisation when working from home as well as the factors that could increase employee engagement. The results from the author's two-stage survey of employees in Bulgarian organisations show that their engagement with the organisation has not decreased despite the long work from home due to the pandemic and the challenges associated with it.

Keywords: engagement; remote work; COVID-19; factors affecting employee engagement JEL: M12; M54; O33

Sevdalina Hristova

THE IMPACT OF THE PUBLIC PROCUREMENT SYSTEM REFORM ON BULGARIAN SMALL AND MEDIUM-SIZED ENTERPRISES

Public procurement can be used as an instrument for policy-making in different fields – social, environmental, economic, as well as for direct business support. It is well known that the increased participation of SMEs on the public procurement market leads to significant benefits for both contracting authorities and society. A lot of studies have found that SMEs are inadequately

represented in this market. Therefore, in 2016, the European Union introduced common measures to promote the participation of SMEs in the public procurement market. A critical review of these measures has been made, highlighting some of their strengths and weaknesses. Based on the analysis of the public procurement market in Bulgaria, the measures are assessed as insufficiently effective. The proposed solutions are in two directions: how to motivate contracting authorities to implement the introduced measures and how to increase the confidence of SMEs in the procurement process in order to encourage them to participate in tender procedures.

Keywords: public procurement; SMEs; access to public procurement market; Bulgaria JEL: H57; D41

Mohammad Abedalrahman Alhmood, Hasnah Shaari, Redhwan Al-dhamari

AUDIT PARTNER CHARACTERISTICS AND REAL EARNINGS MANAGEMENT PRACTICES IN JORDAN

The financial scandals that occurred of late have raised concerns on the effectiveness of external audit in restricting earnings management. Also, audit failure in the capital market has led to augmented concerns towards audit quality. In addition, an external audit considers an external monitoring mechanism in which "independent" auditors carry out audits on a firm's internal controls and financial reports and provide their opinions to the company's owners. Besides that, the external audit is expected to deter the management from managing earnings. Thus, this study explores the effect of the individual attributes of the audit partner on real earnings management practices in Jordan. To do so, data from 58 ASE-listed companies were analysed for six years, i.e., from 2013 to 2018. The results indicated that audit partner tenure and REM are positively and significantly related. Furthermore, audit partner affiliation was found to be negatively and significantly associated with REM. Meanwhile, audit partner age and educational background were shown to have no effect on REM. The findings of the current study have implications on investors, regulators, and market participants by affording a considerable indication that the attributes of audit partners are very crucial in explaining the REM activities.

Keywords: External audit; Audit partner characteristics; Real earnings management; Jordan; Amman stock exchange.

JEL: G30; M41; M42