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Review of contemporary business, entrepreneurship and economic issues

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FOREWORD

Dear readers,

we would like to inform you that, as of this issue, we won't publish this journal in printed form.

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COMPARATIVE ANALYSIS OF THE TAX WEDGE IN CROATIA AND SLOVENIA FROM 2005 TO 2020

Abstract

Purpose: Personal income tax (PIT) and social security contributions (SSC) play a significant role in tax systems. Since both of them affect employers and employees, it is important to analyse the labour costs paid by the employer (gross wage) and the net wage received by the employee, i.e., the tax wedge.

Methodology: Following OECD's *Taxing Wages* methodology, this paper analyses the characteristics of the tax wedge and the tax wedge policy in the Republic of Croatia and the Republic of Slovenia in the period from 2005 to 2020.

Results: The conducted analysis has shown that a Slovenian taxpayer faces the highest average net tax wedge for each observed family type, and that the Croatian tax wedge is lower in all hypothetical units observed. The taxpayer with the highest average gross wage also faces the highest tax burden. The problem of a relatively high tax wedge in Croatia and Slovenia does not lie with the personal income tax, which is relatively low, but with social contributions.

Conclusion: The tax wedge primarily depends on the level of income, it decreases if the taxpayer has (more) children, and its amount depends on various levels of tax, deductions and social security contributions. In the future, the focus will be on alleviating the labour tax burden. However, this begs the question of how to further alleviate the burden on labour without implementing major structural reforms in the pension and healthcare system and/or introducing new tax forms.

Keywords: Labour costs, personal income tax, social contributions, tax wedge, Croatia, Slovenia

1. Introduction

By changing the structure and amount of the labour tax burden, fiscal policy holders can make a significant impact on labour market trends and the overall economy. Bearing this in mind, over the last 20 years, many developed and developing countries have implemented numerous changes in the labour tax system. Individual income taxes, payroll taxes and consumption taxes make up a large portion of tax revenue in many countries. These taxes combined make up the tax burden on labour both by taxing wages directly and through the tax burden on wages used for consumption. Personal income tax

(PIT) and social security contributions (SSC) play a significant role in the tax systems of many countries worldwide. Since personal income tax and social security contributions affect both employers and employees, EU and OECD member states use the tax wedge as a measure of the labour tax burden. The tax burden on labour, i.e. "a tax wedge," refers to the difference between an employer's cost of an employee and the employee's net disposable income.

The wedge is determined by several factors: the amount of pretax income (referred to as "labour cost") of a worker, the taxes that apply to that income, and whether the taxpayer is filing as a single worker or as a family. The tax wedge represents the amount of benefits payable to the state out of the total labour costs. State benefits are prescribed by law and differ between countries. Tax liabilities and tax contributions vary between different types of taxpayers depending on the employee's wage level, place of residence and dependent family members affecting the taxpayer's personal allowance. Since 1979, the OECD has been covering tax burden calculations for different family types (married, with or without children) as well as different wage levels. According to the OECD (OECD, 2015, 2016a, 2016b, 2016c, 2021), taxes and contributions levied on gross earnings constitute three levels of burden: 1) the tax burden (the share of personal income tax in the gross wage); 2) the net tax burden or personal average tax rate (the share of the sum of personal income tax and social security contributions paid by the employee in the gross wage); and 3) the total tax burden or tax wedge (the sum of personal income tax and employee and employer social security contributions expressed as a percentage of labour costs).

Croatia and Slovenia are transition countries, the EU member states with shared history (the former SFRY republics), but different in many aspects – population, national income level, living standard, per capita income, employment levels, and the like. The current Croatian and Slovenian tax systems have significantly changed since their establishment in the early nineties, and they have been aligned with the practice of most European countries. Over the years, both countries have implemented numerous reforms in the personal income tax system. On the one hand, taxation of wages in Croatia and Slovenia vary in several respects, such as the number and types of tax relief, the number and width of the PIT schedule brackets, the levels of PIT marginal tax rates across the schedule brackets, the numbers and types of SSC, as well as the rates and definitions of their bases. However, on the other hand, the common characteristics of these two countries regarding the taxation of wages are a progressive national PIT tax schedule and the taxation of gross wages with the employers' and employees' SSC (the basis for SSC is the gross wage; the employees' SSC always includes pension contributions and the employers' SSC always includes healthcare contributions).

There are not too many papers which investigate the developments and the tax burden on labour income in Croatia and Slovenia. According to the main empirical results of the analysis of the taxation of labour income in Croatia and Slovenia (Blažić & Trošelj, 2012; Beketić, 2016; Čok et al., 2013; Dolenc & Vodopivec, 2005; Šimović & Deskar-Škrbić, 2015; Grdović Gnip & Tomić, 2010; Šeparović, 2009; Urban, 2006; Urban et al., 2019), it can be observed that although they have many similarities, these countries have pursued different economic and fiscal strategies and achieved different results in the area of income taxation.

The key goal of this paper is to analyse and compare the changes in labour income taxation in Croatia and Slovenia, with special emphasis on the creation of a tax wedge. According to the OECD methodology, we will analyse the tax wedge for the following two types of taxpayers in the Republic of Croatia and the Republic of Slovenia for the period from 2005 to 2020:

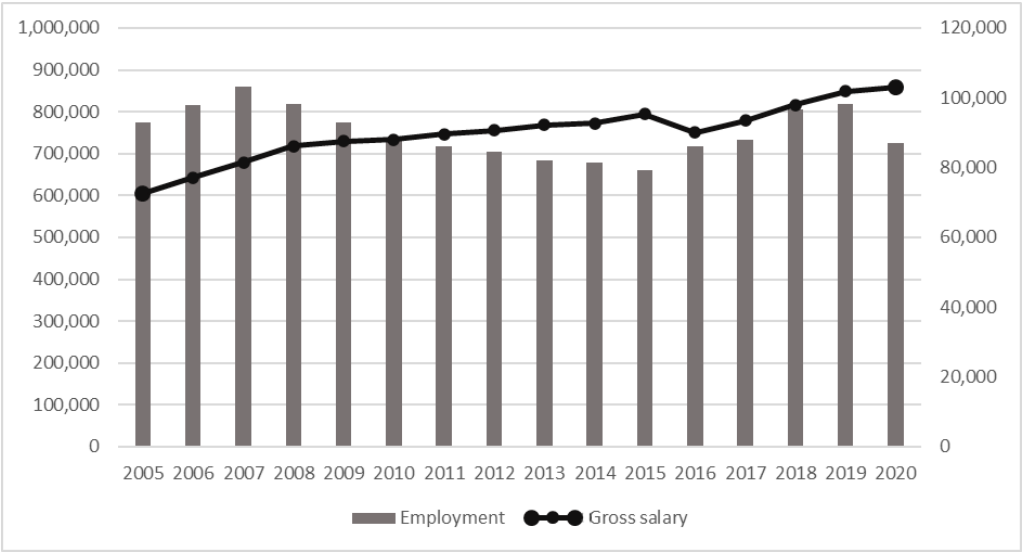
1. An individual enjoying 67%, 100% and 167% of the average gross wage - a single taxpayer without dependent children or family members, approved only of the basic personal allowances, with factor 1.

2. A one-earner married couple with two children, where the employed spouse enjoys 67%, 100% and 167% of the average gross wage, and the other spouse and two children represent the dependent family members. Therefore, this taxpayer is entitled to the basic personal allowance (factor 1) and a deduction for the first child (factor 0.7) and the second child (factor 1), which ultimately constitutes the basic personal allowance with the total factor of 2.7.

2. Analysis of the tax wedge in the Republic of Croatia

Since its independence, Croatia has been regulating income tax through a number of legislative solutions that have undergone numerous changes in terms of taxable income, personal allowance level, schedule and number of tax classes and tax rates, number of tax reliefs, and the manner of taxation of individual types of income. Croatian taxpayers are also subject to surtax determined at the local level. Surtax rates differ between cities and municipalities.[1] When calculating a tax wedge, the average annual gross wage is calculated following OECD's methodology. During the observation period, the largest number of workers was employed in the processing industry (sector D), whereas the smallest number was employed in mining and extraction (sector C), and after 2008, in sector B. From 2005 to 2006, the lowest average gross wage was observed in sector F (construction), while from 2007 to 2009, it was observed in sector H and sector I. In the period from 2010 to 2019, the lowest average gross wage was again observed in sector F (construction), switching to sector I in 2020.[2]

Graph 1 Employment in sectors C-K (left axis) and the average gross wage in sectors C-K (right axis) in the Republic of Croatia in the period from 2005 to 2020



Source: Authors' calculations based on the data of the Croatian Bureau of Statistics, 2005-2020

1 The average weighted surtax rate is calculated by taking as the weight the number of persons with residence in a certain municipality and city according to the 2001 census. Since certain local units have increased the surtax rate over time, and the rate was therefore probably somewhat higher, in 2020, due to the COVID-19 pandemic, some local units reduced or even eliminated the surtax. Therefore, this paper relies on the weighted average of surtax rates, which is 11.16% (as calculated by Grdović Gnip and Tomić, 2010, p. 13)

2 For the period 2005-2007, we used the methodology applied since 2004, that is, the 2002 National Classification of Activities, while for the period 2008-2020, we used the 2007 National Classification of Activities, where the structure of activities was somewhat modified.

According to the presented employment and average annual gross wage trends obtained using OECD's methodology in the period 2005-2020, we can see that during the observation period employment was at its highest in 2007 when the number of employed persons was 858,851. After that, this number started falling until 2015 when the lowest number of employed persons was recorded (661,391), which constitutes a 23% decrease. From 2016 to 2019, employment rates went up, while in 2020, due to the coronavirus pandemic, the number of employed persons (725,340) fell by 11.46% in comparison to 2019. The average annual gross wage during the observation period increased between 2005, when it was HRK 72,481, and 2015, when it was HRK 95,293.67, constituting an overall increase of 31%. The average gross wage decreased in 2016, followed by an upward trend until 2020. The reason for the indicated decrease lies with the international financial crisis, the consequences of which could be felt until 2016, whereas the decrease in 2020 was caused by the COVID-19 pandemic, the consequences of which were felt in 2020 and 2021. The COVID-19 crisis in 2020 resulted in the greatest decrease in the average tax wedge at the level of OECD countries since the 2008-2009 global financial crisis, which caused the countries throughout the world and in the EU to implement numerous changes due to the decrease in the average wage caused by the pandemic and the changes implemented by the countries in their labour tax systems in response to the pandemic. For an individual enjoying 100% of the average gross wage it was HRK 72,481 in 2005, while it was HRK 102,965.97 in 2020. On the other hand, in the case of an individual enjoying 67% of the average gross wage, it was HRK 48,562.27 in 2005, and HRK 68,987.20 in 2020, and for an individual enjoying 167% of the average gross wage, it was HRK 121,043.27 in 2005, and HRK 171,953.17 in 2020. The gross wage in 2005 for these three hypothetical units observed was higher by HRK 48,562.27 in relation to an individual enjoying 100% or 67% of the average gross wage. The gross wage in 2020 for these three hypothetical units observed was higher by HRK 68,987.20 in relation to an individual enjoying 100% of the average gross wage.

An individual taxpayer is a single worker without dependent children or family members and the only allowance such a taxpayer can enjoy is the basic personal allowance. In this case, a single individual enjoys 100% of the amount of the average annual gross wage. An individual taxpayer is a single worker that can only use the basic personal allowance; in this case such a taxpayer enjoys 67% of the average gross wage and is referred to as a taxpayer of lower economic/wage power. The analysis of the tax wedge for an individual taxpayer of higher economic power should show whether such a taxpayer's tax burden is heavier.

Table 1 shows all three levels of the tax burden for a Croatian individual taxpayer enjoying 67%, 100% and 167% of the average gross wage, and for a taxpayer with two children who enjoys 67%, 100% and 167% of the average gross wage in the period from 2005 to 2020.[3]

3 The tax burden shows the share of personal income tax and surtax in the gross wage. This share decreases if the level of personal income changes, that is, if the tax burden on the taxpayer is alleviated. The net tax burden shows the share of personal income tax, surtax and contributions from the salary in the gross personal income, while the tax wedge represents the share of tax, surtax, contributions from the salary and contributions on the salary in the total labour cost.

Table 1 Comparative overview of tax wedges for an individual taxpayer and a taxpayer with two children, who enjoyed 67%, 100% and 167% of the average gross wage in the Republic of Croatia from 2005 to 2020 (in %)

		2005		2006		2007		2008		2009		2010		2011		2012	
		Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple
Tax burden	67%	6.57	0.00	7.15	0.00	7.48	0.44	7.45	0.57	7.20	0.00	6.51	0,00	5.87	0.14	5.23	0.10
	100%	8.98	3.58	9.79	4.22	10.45	4.70	10.39	4.65	9.90	4.30	9.13	3.90	8.57	3.60	9.54	2.65
	167%	14.30	9.01	14.78	9.82	15.18	10.47	15.14	10.41	14.85	9.92	14.39	9.48	14.05	9.24	14.63	9.17
Net tax burden	67%	26.75	20.00	27.15	20.00	27.48	20.44	27.45	20.57	27.20	20.00	26.51	20.00	25.87	20.14	25.23	20.10
	100%	28.98	23.58	29.79	24.22	30.45	24.70	30.39	24.65	29.90	24.30	29.13	23.90	28.57	23.60	29.54	22.65
	167%	34.30	29.01	34.78	29.82	35.18	30.47	35.14	30.41	34.85	29.92	34.39	29.48	34.05	29.24	34.63	29.17
Tax wedge	67%	37.50	31.74	37.84	31.74	38.12	32.12	38.10	32.23	37.89	31.74	37.29	31.74	36.75	23.86	35.83	31.43
	100%	39.40	34.80	40.10	35.34	40.66	35.75	40.16	35.71	40.19	35.41	39.53	35.07	39.05	34.81	39.53	33.61
	167%	43.94	39.43	44.35	40.12	44.69	40.68	44.65	40.63	44.41	40.21	44.02	39.83	43.73	39.62	34.90	39.21

		2013		2014		2015		2016		2017		2018		2019		2020	
		Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple
Tax burden	67%	4.97	0.00	5.00	0.00	4.15	0.00	3.77	0.00	1.93	0.00	2.82	0.00	3.51	0.00	2.78	0.00
	100%	10.13	2.27	10.20	2.32	9.13	1.06	8.36	0.50	8.34	0.00	8.93	0.00	9.39	0.00	8.91	0.00
	167%	14.99	9.59	10.26	6.05	14.39	7.85	13.93	7.01	13.55	4.84	13.91	5.60	14.19	6.18	13.90	5.98
Net tax burden	67%	24.97	20.00	25.00	20.00	24.15	20.00	23.77	20.00	21.93	20.00	22.82	20.00	23.51	20.00	22.78	20.00
	100%	30.13	22.27	30.20	22.32	29.13	21.06	28.36	20.50	28.34	20.00	28.93	20.00	29.39	20.00	28.91	20.00
	167%	34.99	29.59	30.26	26.05	34.39	27.85	33.93	27.01	33.55	24.84	33.91	25.60	34.19	26.18	33.90	25.98
Tax wedge	67%	34.87	30.56	35.46	31.15	35.28	31.74	34.96	31.74	33.39	31.74	34.14	31.74	34.34	31.33	33.72	31.33
	100%	39.35	32.52	39.93	33.15	39.53	32.65	38.88	32.17	38.85	31.74	39.36	31.74	39.39	31.33	38.98	31.33
	167%	43.57	38.88	39.96	36.36	44.02	38.44	43.62	37.72	43.25	35.81	43.61	36.52	43.51	36.64	43.26	36.47

Source: Authors' calculations based on the data of the Croatian Bureau of Statistics, the Ministry of Finance, the Income Tax Act, and the Contributions Act

It is evident that the heaviest tax burden was borne in the observation period by the taxpayer who enjoyed 167% of the average gross wage, that is, the one with the highest gross wage. The lowest tax wedge and the lowest tax burden were borne by the individual with the smallest average gross wage, that is, the individual with the lowest economic power. Throughout the observation period, mild oscillations in the tax burden were recorded in all hypothetical units observed. In the case of a taxpayer who enjoyed 100% of the average gross wage, the tax burden decreased by 1.1%, while in the case of a taxpayer who enjoyed the highest average gross wage, it decreased by 1.6%, and for an individual with the lowest economic power, it decreased by almost four percentage points or as much as 10.1% relatively. This was a result of numerous changes in the personal allowance, tax rates and tax classes throughout the observation period, but with an emphasis on the fact that contributions from and on the salary were equal for all taxpayers, thereby increasing the tax burden on all of them. In the same period, the only change that occurred was the one in healthcare insurance contributions charged to the employer, which increased by 16.5%.

If we analyse a taxpayer with two children enjoying 167% of the average gross wage in the observation period, it is evident that such a taxpayer carried the heaviest tax burden. A taxpayer with two children enjoying 100% of the average gross wage carried a lower tax burden, while a taxpayer with two children enjoying 67% of the average gross wage carried the lowest tax burden as well as lower economic power. Throughout the observation period, a mild decrease in the tax wedge was observed, so a taxpayer with two children enjoying 167% of the average gross wage faced a tax burden of 39.43% in 2005, whereas a taxpayer with two children benefiting from 67% of the average gross wage faced a tax burden of 31.74%, which is 19.5% less. In 2020, the tax wedge for a taxpayer with two children enjoying 167% of the average gross wage was 36.47%, while for a taxpayer with two children enjoying 67% of the average gross wage it was 31.33%, i.e., 14.09% less. From 2017 to 2020, a taxpayer with two children enjoying 100% and the one with 67% of the average gross wage faced the same level of the tax wedge, precisely due to an increase in the personal allowance and tax deduction factors for dependent children, which resulted in a low tax base.

Looking at the structure of the tax wedge in Croatia, we can conclude that the amount of the wedge primarily depends on social security contributions, and not on the personal income tax or the surtax for both taxpayer types. The greatest share pertains to contributions from the salary and contributions on the salary which have remained almost unchanged, holding the tax wedge at a high level. An individual taxpayer who enjoyed 100% of the average gross wage faced the greatest share of tax and surtax in 2007 (8.91%), and the lowest one in 2017 (7.11%). Such a taxpayer faced the largest share of net personal income in 2017 (61.15%), and the lowest one in 2007 (59.34%), precisely due to a high tax burden. An individual taxpayer who enjoyed 67% of the average gross wage had the largest share of tax and surtax in the total cost (6.8%) and the lowest share of net income (61.88%) in 2007 due to a high tax burden, while such a taxpayer had the highest share of net income (66.61%) and the lowest tax liability (1.65%) in 2017. A taxpayer who enjoyed 167% of the average gross wage had the highest share of tax and surtax in the total labour cost in 2012, when it amounted to 13.69%, and the lowest share in 2014 (9.59%). On the other hand, such a taxpayer had the highest net income in 2014 (58.97%), and the lowest in 2007 (55.31%), which represents an increase of 6.21%.

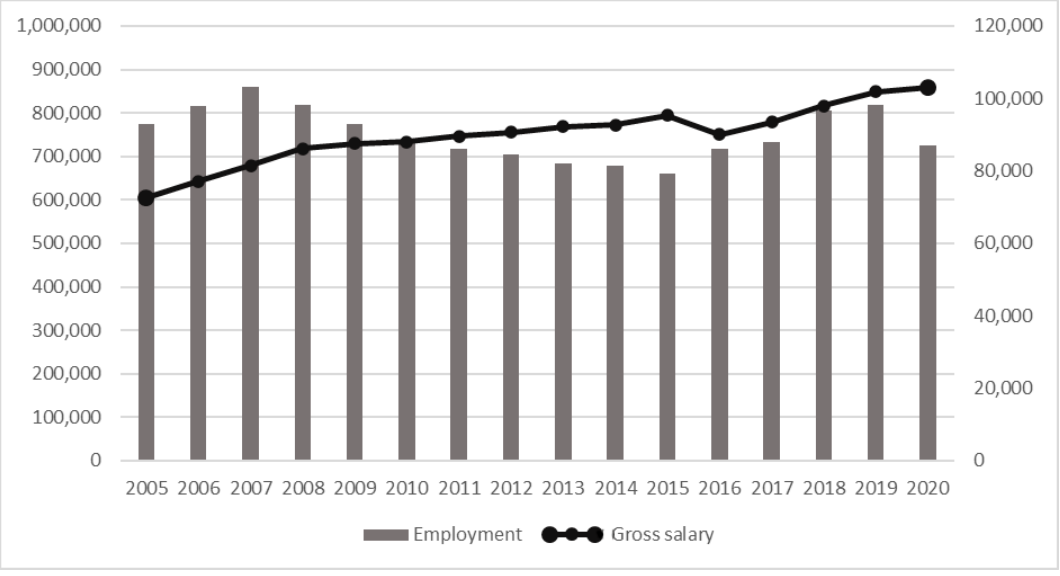
An individual taxpayer with two children who enjoyed 100% of the average gross wage had the highest share of tax and surtax in the total labour cost in 2007 (4.01%), while the lowest share was recorded in the period between 2017 and 2020, when it amounted to 0% due to an increase in the personal allowance and a change in the deduction factor for dependent children. Such a taxpayer achieved the highest net income in 2019 and 2020 (68.67%) and the lowest net income in 2007 (64.25%), which is consistent with a high tax burden. An individual taxpayer with two children who enjoyed 67% of the average gross wage had the highest share of tax and surtax in the total labour cost in 2008 (0.49%), and the lowest one in the period from 2005 to 2006, and 2009 to 2010, and also from 2013 to 2020, when it amounted to 0% due to an increase in the personal allowance and a change in the deduction factor for dependent children. Such a taxpayer achieved the highest and the lowest net income in 2013 (69.44%) and in 2008 (67.77%), respectively. An individual taxpayer with two children who enjoyed 167% of the average gross

wage had the highest share of tax and surtax in the total labour cost in 2007 (8.94%), and the lowest share in 2017 (4.14%). Such a taxpayer achieved the highest and the lowest share of net personal income in 2017 (64.19%) and in 2007 (59.32%), respectively.

3. Analysis of the tax wedge in the Republic of Slovenia

Slovenia and Croatia are both transition countries of the former socialist block and republics of the former SFRY that commenced in the early 1990s their processes of privatising state-owned property, return of seized property, and economic and political transformation of national economy, turning toward a market-based economy. In doing so, both countries underwent numerous processes and reforms that modified the structure of society, and thus also of the economy, where (active) fiscal policy played an important role. In this part of the paper, we will analyse the tax wedge in the Republic of Slovenia for the same hypothetical units and the same income levels as in the case of the Republic of Croatia, so as to gain insight into the similarities and/or differences between these two countries in relation to the tax burden on income. During the observation period, the largest number of employees worked in sector D, i.e., the processing industry, while the lowest number of employees from 2005 to 2007 was observed in sector K, i.e., sector L in real estate trade, rental and business services, and in 2008 and onwards, it was observed in mining and extraction (sector C) and in sector B. The highest average gross wage in the observation period was observed in sector J, i.e., K (financial mediation), followed by sector C (sector B) - mining and extraction. The lowest average gross wage was observed in sector H (sector I) - hotels and restaurants.

Graph 2 Employment in sectors C-K (left axis) and the average gross wage in sectors C-K (right axis) in the Republic of Slovenia in the period from 2005 to 2020



Source: Authors' calculations based on the data of the Statistical Office of the Republic of Slovenia, 2005-2020, and the Croatian National Bank

Throughout the observation period, employment rates peaked in 2008 with 502,775 employees, followed by a gradual decline in the number of employees until 2014 when it reached its lowest - 405,780, which is a decline of 19.29%. From 2015 to 2019, a slight increase in employment occurred. In 2020, the number of employed persons decreased by 1.84% in relation to 2019, amounting to 460,161.

The average annual gross wage gradually increased throughout the observation period. It was at the lowest level in 2005 when it amounted to HRK 92,307.43. It increased gradually, reaching HRK 146,641.41 in 2017, which is a 58.86% increase in relation to 2005. In 2019, the average annual gross wage was at the highest level and amounted to HRK 149,917.54, while in 2020, the gross wage was HRK 146,564.53, meaning it decreased by 2.24%. For a taxpayer enjoying 100% of the average gross wage, it amounted to HRK 92,307.43 in 2005 and HRK 146,564.53 in 2020. For an individual enjoying 67% of the average annual gross wage, it amounted to HRK 61,845.98 in 2005 and HRK 98,198.24 in 2020. For a taxpayer enjoying 167% of the average gross wage, it amounted to HRK 154,153.41 in 2005 and HRK 244,762.77 in 2020. The gross wage for all three hypothetical units observed was HRK 61,845.98 higher in 2005 in relation to an individual enjoying 100% of the average gross wage (67%). The gross wage for these three hypothetical units observed was HRK 98,198.24 higher in 2020 in relation to an individual enjoying 100% of the average gross wage (67%). A decrease in the number of employed persons and the average annual gross wage in 2009 and 2020 was caused, just like in Croatia, by the international financial crisis and the COVID-19 pandemic.

In the observation period, the heaviest tax burden was borne by the taxpayer who enjoyed 167% of the average gross wage, that is, the one with the highest gross wage and economic power. The lowest tax wedge and the lowest tax burden were observed for an individual with the lowest economic power. For a taxpayer who enjoyed 100% of the average gross wage, the tax wedge decreased by 1.45%, while for a taxpayer who enjoyed 167% of the average gross wage, it decreased by 6.21%. The tax wedge for the taxpayer with the lowest economic power increased by 1.1%. However, in both Slovenia and Croatia, the contributions from and on the salary are equivalent for all three taxpayers analysed, indicating that the contribution burden does not depend on the income level.

Table 2 A comparative overview of tax wedges for an individual taxpayer and a taxpayer with two children, who enjoyed 67%, 100% and 167% of the average gross wage in the Republic of Slovenia from 2005 to 2020 (in %)

		2005		2006		2007		2008		2009		2010		2011		2012	
		Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple
Tax burden	67%	8.61	0.55	8.87	1.24	8.69	1.40	8.83	1.61	8.75	1.55	8.93	2.01	9.01	2.20	8.94	2.04
	100%	13.51	4.80	14.27	5.26	12.00	5.37	12.31	5.51	12.30	5.47	12.55	5.78	12.72	5.91	12.57	5.80
	167%	20.00	12.53	20.59	13.51	18.29	11.34	18.75	11.58	18.83	11.58	19.11	12.00	19.37	12.37	19.18	12.08
Net tax burden	67%	24.71	16.65	24.97	17.34	24.79	17.50	24.93	17.71	24.85	17.65	25.03	18.11	25.11	18.30	25.04	18.14
	100%	29.61	20.90	30.37	21.36	28.10	21.47	28.41	21.61	28.40	21.57	28.65	21.88	28.82	22.01	28.67	21.90
	167%	36.10	28.63	36.96	29.61	34.39	27.44	34.85	27.68	34.93	27.68	35.21	28.10	35.47	28.47	35.28	28.18
Tax wedge	67%	38.34	31.74	38.55	32.30	38.40	32.43	38.51	32.61	38.45	32.56	38.60	32.93	38.66	33.09	38.61	32.96
	100%	42.35	35.22	42.97	35.60	41.12	35.68	41.37	35.80	41.36	35.76	41.56	36.02	41.70	36.12	41.58	36.03
	167%	47.67	41.55	48.15	42.35	46.26	40.57	46.64	40.77	46.70	40.77	46.94	41.11	47.15	41.42	46.99	41.18

		2013		2014		2015		2016		2017		2018		2019		2020	
		Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single individual	Married couple	Single Individual	Married couple
Tax burden	67%	9.05	2.08	8.98	2.13	9.03	2.27	9.09	2.42	9.38	3.16	9.38	3.14	9.51	3.48	9.13	2.88
	100%	12.64	5.82	12.65	5.86	12.77	5.95	12.91	6.05	13.56	6.55	13.55	6.54	13.84	7.02	12.76	6.36
	167%	17.75	11.94	17.89	12.03	18.09	12.20	17.65	12.30	17.99	13.00	17.98	12.98	18.33	13.29	16.39	12.32
Net tax burden	67%	25.15	18.18	25.08	18.23	25.13	18.37	25.19	18.52	25.48	19.26	25.48	19.24	25.61	19.58	25.23	18.98
	100%	28.74	21.92	28.75	21.96	28.87	22.05	29.01	22.15	29.66	22.65	29.65	22.64	29.94	23.12	28.86	22.46
	167%	33.85	28.04	33.99	28.13	34.19	28.30	33.75	28.40	34.09	29.10	34.08	29.08	34.43	29.39	32.49	28.42
Tax wedge	67%	38.70	32.99	38.64	33.03	38.68	33.14	38.73	33.27	38.97	33.87	38.97	33.86	39.07	34.13	38.76	33.64
	100%	41.64	36.05	41.65	36.08	41.75	36.16	41.86	36.24	42.39	36.65	42.38	36.64	42.62	37.04	41.74	36.49
	167%	45.82	41.06	45.94	41.14	46.10	41.28	45.74	41.38	46.02	41.93	46.01	41.92	46.30	42.17	44.71	41.38

Source: Authors' calculations based on the data of the Statistical Office of the Republic of Slovenia and the Financial Administration of the Republic of Slovenia

The observation period shows that the highest tax burden lies with the taxpayer with two children who enjoyed 167% of the average gross wage, that is, the one with the highest economic power. A taxpayer enjoying 100% of the average gross wage had a lower tax burden, while a taxpayer with two children enjoying 67% of the average gross wage had the lowest tax burden. Throughout the observed period, the tax wedge for the taxpayer supporting two children and enjoying 100% and 67% of the average gross wage was increasing gradually, while it was decreasing in the case of a taxpayer enjoying 167% of the average gross wage. The taxpayer with two children enjoying 167% of the average gross wage faced a tax burden of 65.13% in 2005, while a taxpayer with 67% of the average gross wage faced a tax burden of 49.75%, which is 23.61% less. In 2020, the tax wedge for a taxpayer with two children enjoying 167% of the average gross wage was 64.86%, while for a taxpayer with two children enjoying 67% of the average gross wage it was 52.73%, i.e., 18.7% less.

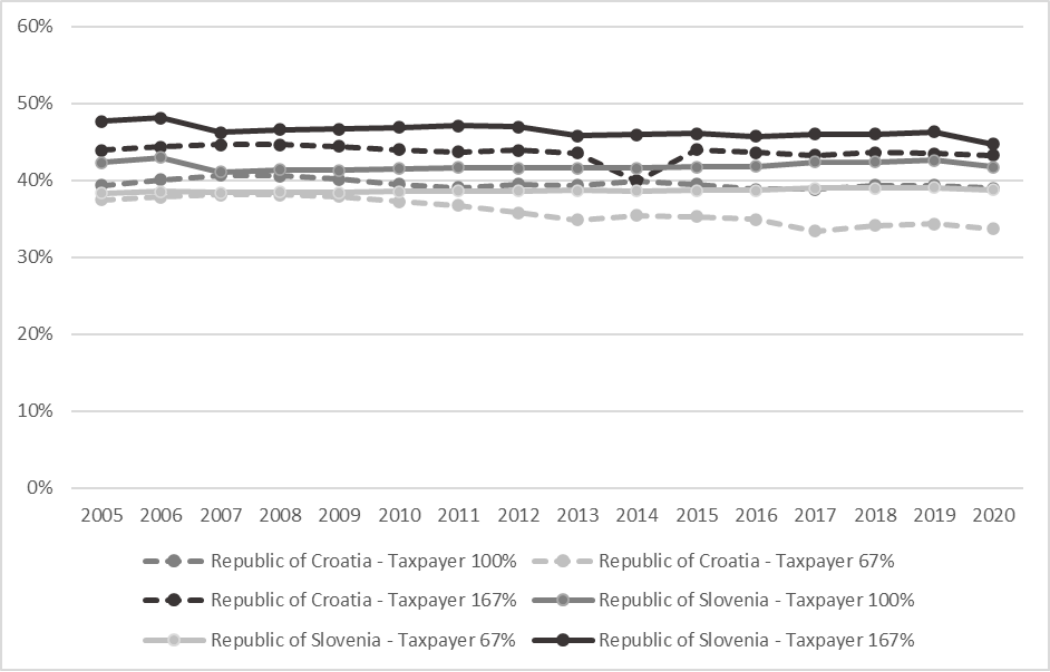
In both Croatia and Slovenia, social contributions are the main factor that defines the structure of the tax wedge and keeps it at a high level. An individual taxpayer who enjoyed 100% of the average gross wage had the greatest and the lowest share of tax in 2006 (11.69%) and in 2007 (9.83%), respectively. Such a taxpayer achieved the largest share of net personal income in 2007 (58.88%), and the lowest in 2006 (57.02%). Throughout the observation period, the greatest share pertained to contributions on the salary, followed by contributions from the salary and then tax. From 2005 to 2020, the tax burden decreased by 5.6%, while the contributions on and from the salary remained unchanged. A mild increase in net income was observed (1.06%). A taxpayer who enjoyed 67% of the average gross wage had the highest and the lowest share of tax in the total labour cost in 2019 (7.79%) and in 2005 (7.05%), respectively; such a taxpayer achieved the highest share of net income in 2005 (61.66%) and the lowest in 2019 (60.93%). Their tax burden was lower and their net income in 2020 was 4.87% higher than that of the taxpayer enjoying 100% of the average gross wage. The taxpayer enjoying 167% of the average gross wage achieved the highest and the lowest share of net income in 2020 (55.29%) and in 2006 (51.85%), respectively, while the contributions from and on the salary remained unchanged throughout the period.

4. Comparison of the tax wedge in the Republic of Croatia and the Republic of Slovenia

A comparison of the tax burden can be impeded by different limitations because countries vary according to properties such as national income level, living standard, income per capita, employment rates, level of development, structure of fiscal income and expenditure, etc. Having compared the tax wedge for an individual taxpayer enjoying 100%, 67%, 167% of the average gross wage in Croatia and Slovenia who uses only the personal allowance, it is evident that the highest tax burden in the observation period pertained to the Slovenian taxpayer enjoying 167% of the average gross wage.

At the beginning of the observation period, the said taxpayer was subject to a 7.82% higher tax than the same taxpayer in Croatia. Throughout the period, this difference was reduced and in 2020, the Slovenian taxpayer was taxed 3.24% more than the Croatian taxpayer. The next is a taxpayer enjoying 100% of the average gross wage. A Slovenian taxpayer was taxed 6.97% more than a Croatian taxpayer in 2005, while in 2020, this difference was reduced to 6.61%. The lowest tax burden pertains to a taxpayer with the lowest economic power, that is, a taxpayer enjoying 67% of the average annual gross wage. In 2005, the tax difference was quite small, more precisely, the Slovenian taxpayer paid 2.2% more tax than a Croatian taxpayer. This difference increased gradually, reaching 13.01% in 2020.

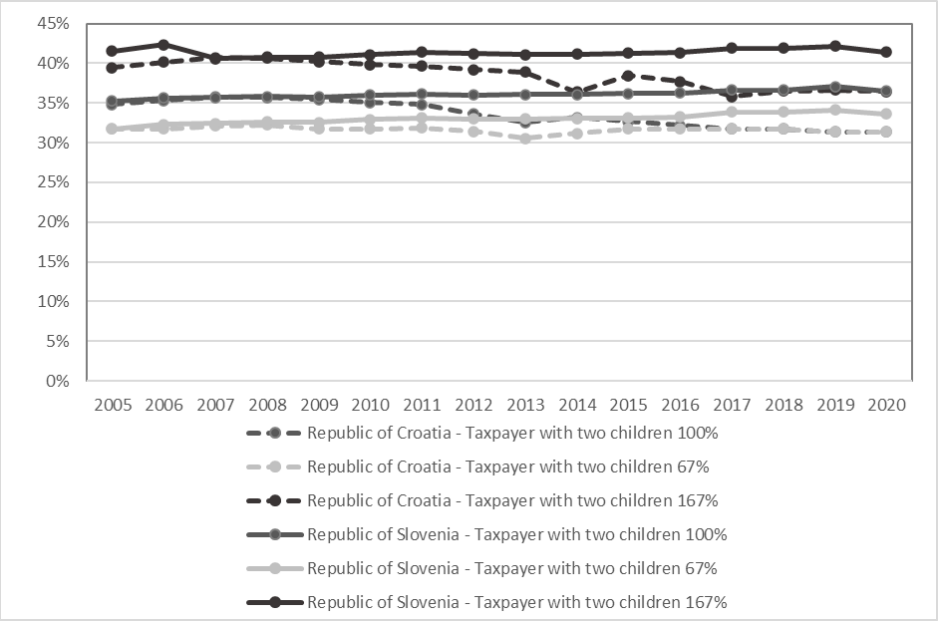
Graph 3 Comparative tax wedges for an individual taxpayer who enjoyed 67%, 100% and 167% of the average gross salary in the Republic of Croatia and the Republic of Slovenia from 2005 to 2020



Source: Authors' calculations

If we compare the trend of the tax wedge for a taxpayer with two children who enjoys 100%, 67% and 167% of the annual gross wage in Croatia and in Slovenia, where the personal allowance additionally increased due to dependent children, we can conclude that the highest tax burden is borne by the taxpayer with the highest economic power, in this case, the Slovenian taxpayer supporting two children, who was taxed 3.58% more than a Croatian taxpayer supporting two children. During the observation period, the tax wedge decreased in both countries. However, overall, the Slovenian taxpayer is still taxed as much as 11.87% more. On the other hand, in 2005, a Slovenian taxpayer supporting two children and enjoying 100% of the average annual gross wage was taxed 1.20% more than the same taxpayer in Croatia, while in 2020, the Slovenian taxpayer was taxed 14.14% more. It is obvious that the tax wedge for a Slovenian taxpayer supporting two children gradually increased, while it gradually decreased in Croatia. The lowest tax burden pertains to a taxpayer supporting two children and enjoying 67% of the average annual gross wage. In 2005, the tax burden was equal in both countries, but during the observation period, in the Republic of Croatia, it gradually decreased, while it increased in the Republic of Slovenia. This is why the Slovenian taxpayer was taxed 6.87% in 2020. The problem with the tax wedge level in the observed countries does not lie with personal income tax, but with the contributions from and on the salary, which constitute a large share in the total labour cost. However, a decrease in the contributions is related to reforms in pension (and health) insurance, which is a topic for entirely new research.

Graph 4 Comparative tax wedges for a taxpayer who supported two children and enjoyed 67%, 100% and 167% of the average gross salary in the Republic of Croatia and the Republic of Slovenia from 2005 to 2020



Source: Authors' calculations

5. Conclusion

There are a number and variety of factors according to which individuals in a certain country pay taxes and other duties from their earnings. Most citizens of any country want to keep as much of it as possible, that is, have as much as possible with minimum labour-related costs. In this paper, tax burden indicators were compared for various types of families and various levels of income in Croatia and Slovenia. Although the analysed countries are geographically relatively similar, share a common past, are now EU Member States, the research conducted did not reveal similarities from the standpoint of progressiveness because wage taxation systems of both Croatia and Slovenia are progressive, that is, the average tax rate increases with an increase in the gross salary. Throughout the entire analysis period, the tax burden on income from employment was lower in Croatia than in Slovenia. In this period, Slovenia modified its personal income taxation system to a lesser extent than Croatia. Slovenia reshaped its three-level income tax schedule (16, 27 and 41%) to a five-level one (from 16 to 50%), while Croatia changed its four-level income tax schedule (15, 25, 35 and 45%) to a two-level schedule (24 and 36%, that is, 20 and 30% as of 2021) and significantly increased the amounts of the basic personal allowance.

A Slovenian taxpayer had the highest average tax wedge for each observed type of family and the Croatian tax wedge was lower for all hypothetical units observed. Therefore, an individual living in Croatia and enjoying 100% of the average gross wage in 2020 was subject to a 38.98% tax burden, while the tax burden borne by an individual with lower economic power was 33.72% and that borne by a taxpayer enjoying 167% of the average gross wage was 43.26%. We can conclude that the taxpayer with the highest average gross wage also had the highest tax burden. As regards families, the lowest tax burden pertains to a taxpayer supporting two children and enjoying 67% of the average annual gross wage. The problem of a relatively high wedge in Croatia and Slovenia does not lie with the personal income tax (which is relatively low) but with contributions. Decreasing the amount of contributions is related

to reforms of the health and pension insurance system, which are very extensive and demanding issues that need to be analysed separately. Contributions on and from the salary in the observation period changed more often in Croatia than in Slovenia, where they in fact remained unchanged. In both countries, the contributions constitute the largest share in the total labour cost. In both countries, an individual's net income makes up about 60% of the total employer's labour cost, while the rest pertains to benefits payable to the state in the form of tax, surtax and contributions in the amount of 40%.

The results show that the tax wedge primarily depends on the level of income and decreases if the taxpayer has (more) children, and that its amount depends on various amounts of tax and social security contributions, the burden of which is distributed between the employer and the employee. Croatian fiscal policy holders intervened in the labour tax system more often than their Slovenian counterparts, and they introduced amendments to legal acts to facilitate a decrease in the tax burden on wages, which was most affected by a significant increase in the basic personal allowance and an increase in the deduction coefficient for children and dependent family members. The amendments in both Slovenia and Croatia affected an increase in the available income of taxpaying employees, but did not affect the labour cost for employers because of the amount of contributions.

In the future period, the emphasis will still be on a decrease in the labour tax burden which, considering the existing deficits in the pension and healthcare system, begs the question of how to alleviate the labour tax without introducing new forms of taxes and/or more significant structural reforms in the pension and healthcare system. Future research can be more interesting if a larger number of transition countries are used and with more factors according to which the wedge is determined.

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CORRUPTION PRESSURE ON BUSINESS REVISITED: BRIBERY INCIDENCE IN EUROPEAN COUNTRIES

Abstract

Purpose: This paper investigates whether within the European countries with a prevalent number of companies in particular sectors the corrupt rent-seeking practice is more likely to contaminate the entire business sector.

Methodology: Multiple regression analysis was conducted to investigate the determinants of corruption pressure on the business sector.

Results: We found that the share of retail and wholesale trade and public companies in the economy is related to bribery incidence experienced in the domestic business sector as a whole and that the ease of doing business together with EU membership reduces the spread of corruption risk. The transmissible effect of bribery incidence in one sector on the rest of the companies is observed, notwithstanding the post-transition status of a European country.

Conclusion: There is a relationship between the share of retail and wholesale trade and public companies in an economy and bribery incidence experienced by the entire business sector indicating that there might be a spillover effect of bribing in one sector on the rest of the companies.

Keywords: Bribery incidence, doing business, retail and wholesale trade, public companies, spillover effect

1. Introduction

The existing literature on corruption causes and consequences is abundant (for a review, see Jain, 2001; Treisman, 2007; Dimant & Tosato, 2018). The negative effects of corruption, no matter whether they are measured by corruption perception or experience, are explored in different contexts and institutional settings. Despite some evidence of bribes helping firms and citizens to alleviate bureaucratic burdens, there is a consensus on the contagious nature of corruption that leads to systemic (endemic) corruption in all segments of society. Combined petty (administrative) and grand (political) corruption have multiple detrimental effects, and hindering business activity is one of them.

Bribery incidence analyses are available for different economic sectors within which the firms fac-

ing bribery requests operate. They tell us about the exposure to corruption risk of a particular business sector. Given much less is known about the characteristics of national economies of countries where firms are more or less exposed to corruption pressures, we fill the gap in this paper by empirically assessing the corruption risk imposed on the business sector in a unique way. We investigate if in countries with a prevalent number of companies in a particular sector(s) the corrupt rent-seeking practice is more likely to contaminate the entire business sector. The literature suggests that corruption is widespread in countries with strong state influence on the economy (e.g. via public procurement, Grødeland & Aasland, 2011) and/or with a larger share of public companies.

This research aims to provide plausible answers if the size and the role of the state affect the general business exposure to corruption. Are there differences between EU and non-EU member countries or is it the transition legacy that matters? Finally, would a favourable doing business environment mitigate these spillover effects? We posit that the share of retail and wholesale trade and public companies in the economy is related to bribery incidence experienced in the business sector. We also hypothesise that the ease of doing business together with EU membership reduces the spread of corruption risk. Our research takes into consideration the gap in the literature related to the lack of empirical research on antecedents of bribery incidents experienced by firms in European countries.

The paper is structured as follows: the next section gives a brief overview of the literature dealing with firms' exposure to corruption. Section 3 that deals with methodology describes the sampling procedure, variables and data used in the model, and the analytical procedure. The results are presented and discussed in the subsequent sections. The conclusion section offers policy recommendations, and lines of future research, mainly based on the recognised limitations of this study.

2. Literature review

2.1 Corruption as an obstacle to doing business

Corruption as an obstacle to doing business has been extensively studied in the last two decades. Early studies showed multiple negative impacts of corruption on business development and entrepreneurship (Kaufmann & Wei, 2000; Hellman et al., 2000). The most widely used definition of corruption as a misuse of public power for private gain (The World Bank, 2021) supposes that corruption occurs between public and private sectors or within the public sector. However, there is increased evidence of business-to-business corruption when a company employee bribes for his/her personal benefit to the detriment of the whole organisation (Castro et al., 2020; Ashforth & Anand, 2003; Argandoña, 2003).

Corruption works as an arbitrary extra cost to firms. Since corruption rent increases the costs of doing business (Sullivan & Shkolnikov, 2004; Anokhin & Schulze, 2009), corruption extortion risk demands additional resources to fulfil bribery requests (Huang & Yuan, 2021). The findings of Campos et al. (2010) for Brazilian firms showed that about 70 percent of the businesses declared corruption as a major obstacle to firm entry and about one-third of firms identified corruption as a major obstacle to growth. A study of corruption as an obstacle to doing business in seven Western Balkans countries found that 42 percent of companies considered corruption as a big or enormous obstacle to their business (Budak & Rajh, 2014).

Although the growing literature deals with the adverse impact of corruption on business and economic development (Rose-Ackerman, 2017), there is some evidence of the greasing effect of corruption in mitigating the overburdening regulations and/or ineffective institutions (e.g. Leff 1964; Méon & Sekkat, 2005; Méon & Weill, 2010; Dreher & Gassebner, 2013; Budak & Rajh, 2014; Freund et al., 2016; Zeume, 2017; Aghazada & Ashyrov, 2021). The regulation might be intentionally complex and bureaucratic procedures slow and inefficient so that corrupt officials could misuse public office and seek corruption rent in exchange for public service. Firms and citizens mitigate complex and costly procedures by bribing public servants and officials, feeding the vicious circle of growing corruption and deteriorating institutions (Aidt, 2009).

Studies at the micro-level elaborate on the positive but often indirect effects of corruption on firm performance (Sahakyan & Stiegert, 2012; Blagojević & Damijan, 2013; Williams et al., 2016; Hanousek & Kochanova, 2016), productivity (De Rosa et al., 2015; Ashyrov & Akuffo, 2020), investment (Uhlenbruck et al., 2006; Hakkala et al., 2008; Eren

& Jimenez, 2015; Pinto & Zhu, 2016), innovation capacity (Paunov, 2016; Bukari & Anaman, 2020; Ellis et al., 2020; Chadee et al., 2021), and other outcomes of business activity.

Corruption is a complex phenomenon and therefore needs to be studied from various angles and perspectives (Cuervo-Cazurra, 2015). There is extensive research on a firm's exposure to corruption assessed empirically by both perceived corruption (e.g. Budak & Rajh, 2014, for Western Balkan countries; Botrić, 2020, for SEE countries) and experienced corruption (e.g. Wu, 2009, for Asian firms; UNODC, 2013, and Budak & Rajh, 2014, for the Western Balkans countries; Blagojević & Damijan, 2013, for transition countries; Alm et al., 2016, for large cross-country analyses). As for the measures of corruption employed, the perception of corruption may significantly differ from the real experience where bribery incidence is usually underreported (Treisman, 2007), and perceptions might be formed under the biased assumptions and impressions of exogenous agents (for a review of the issues related to corruption measures, see Charron, 2016).

The negative effect of corruption on doing business could be mitigated by a favorable business environment that supports entrepreneurship and business activities. Past research confirms a strong correlation between the ease of doing business and corruption (Monray & Filipescu, 2012). Chen et al. (2008) found that a doing business environment affects bribery incidence reported by firms in over 50 countries. Other studies reported a significant effect but in the opposite causal direction. The negative effect of corruption on the quality of business regulation and other business environment indicators (Breen & Gillanders, 2012; Nageri & Gunu, 2020) confirmed that widespread corruption deteriorates the ease of doing business (e.g. Shokouhifard et al., 2020, for Islamic countries). Including doing business indicators and corruption in research models was strongly suggested in the early 2000s (Robson et al., 2009), hence the literature exploring the multidimensional effects is still inconclusive. In this study, we posit the following:

The ease of doing business in a country lowers bribery incidence experienced by the business sector of a country.

2.2 Corruption in public and business sectors

Further studies have explored corruption in particular areas such as government and public sector corruption (for a literature review, see Tanzi, 1998; Rose-Ackerman & Palifka, 2016; see Monteduro et al., 2016), and corruption in different business sectors (e.g. Pyman et al., 2009, for defence; Campos et al., 2010, for manufacturing in Brazil, and Kalaj, 2015, for manufacturing in Albania; Shan et al., 2020, for the construction sector). There is evidence of construction, trade, and government as the sectors most prone to corruption.

Construction often covers large infrastructure projects and here corruption is often exported and occurs in complex forms, such as lobbying and embezzlement of public funds. The construction sector might be exposed to corruption risk within the public procurement process, that is, in business engagements with government agencies and public organisations. Public procurement is predisposed to corruption because of a large volume of contracts and public sources of funds (Søreide, 2002). Corruption in public procurement is extensively studied in developing and transition countries (Grødeland & Aasland, 2011; Ateljević & Budak, 2010). Research on European post-transition countries confirmed that corruption is endangering a fair and competitive public procurement process. Slijepčević et al. (2018) illustrate well the scale of the problem for firms as around 90 percent of firms in Croatia and Bosnia and Herzegovina believe that there is a risk of corruption in public procurement. The importance of public procurement in the national economy goes hand in hand with large government expenditures and the size of the state sector, which causes an expected increase in the risk of corruption. Their findings are twofold and seem to depend on the institutional set-up and the country's level of development. Goel and Budak (2006) found that in transition countries, larger governments reduced corruption prevalence, as opposed to the case of developed OECD countries (Arvate et al., 2010). The UNODC report on bribery in the Western Balkans countries suggests that the distribution of bribe incidence among sectors varies among both sectors and countries. Furthermore, their findings show that trade and construction are the sectors most involved in bribery acts (UNODC, 2013). Likewise, variations of bribery in the manufacturing and service sector were observed

in Central and Eastern European (CEE) countries (Hanousek & Kochanova, 2016).

Small bribes were paid rather often, enabling firms to gain a competitive advantage over the so-called "clean" competitors, which is in line with previous findings on corruption distorting private sector competition (Bennett et al., 2013; Calder, 2020). In their cross-country study, Martin et al. (2007) found that competitive intensity and financial constraints increase firm-level bribery activity, while state ownership decreases it.

Accordingly, the following hypotheses are proposed:

Larger government expenditures increase bribery incidence experienced by the business sector of a country.

The number of public companies increases bribery incidence experienced by the business sector of a country.

2.3 Trade and corruption

Corruption as an obstacle in trade works in several ways. Specifically, bribery-like payments in retail trade were studied in past studies (Aalberts & Jennings, 1999). Aßländer and Storchevoy (2017) claim that trade is prone to corruption and describe corrupt practices typical of retail chains in developing countries where retailers apply slotting fees to manufacturers. In business environments where trade is facing bureaucratic obstacles and high administrative costs, corruption may have a greasing effect, like the one Mendoza et al. (2015) found for commerce in Philippine SMEs. In their study of bureaucratic corruption and firm performance in CEE countries, Hanousek and Kochanova (2016) found that construction and wholesale firms are more likely to pay bribes compared to firms in the service sector and retail trade. They also found that the negative spillover effect varies among sectors.

The OECD (2017) identified corruption as one of the most costly non-tariff barriers in global trade. Firms paying entry costs by bribes have fewer resources available to invest in their new market activity. Firms engaged in trade, domestic or international, could act on the supply side as active or passive bribe givers. Active bribery originates on the supply side when firms offer bribes to get contracts/permits, preferential treatment by customers, and other privileges. Passive bribery is initiated by corrupt rent-seekers (usually from the public sector) demanding bribes to ensure special treatment and an unfair advantage to victims of corruption (Wu, 2005). Drivers of bribery determining the firm's propensity to bribe might work similarly across sectors and countries. Based on past research, the following hypothesis is proposed:

The number of trade companies increases bribery incidence experienced by the business sector of a country.

2.4 EU membership and corruption

Favourable conditions for doing business arise within a wider institutional framework granting political stability, rule of law, professional standards, quality of life, and other soft indicators of prosperity. Poor institutional environment nourishes corruption (e.g. Aidt, 2009; Rojas, 2020), and corruption further erodes institutions (e.g. Rose-Ackerman & Palifka, 2016). As shown before, corruption undermines fair trade and public sector efficiency and specifically threatens business in transition countries with a weak institutional set-up. A survey of private businesses in the seven Western Balkans countries observed (UNODC, 2013) revealed that corruption was the third biggest obstacle to business. Bribery incidence that firms experienced in contact with public officials and servants was mostly for administrative purposes (e.g. to speed up procedures, receive better treatment, etc.). It is reasonable to assume that the transition past affects the prevalence of corruption in a country.

As far as European countries are concerned, the institutional changes that ex-socialist countries have gone through in the transition period and the efforts undertaken within the accession process to the EU could make a difference. However, the availability of EU funds to the new EU member states increases corruption risk (Pashev, 2011; Fazekas & King, 2019), at least in the early stage of accession (Alfano et al., 2021). European Union membership provides such favourable institutional set-up. Old EU member states have established good governance standards and public service integrity[1]. Therefore, the following hypotheses are proposed:

Transition legacy increases bribery incidence experienced by the business sector in ex-transition and transition economies.

European Union membership reduces bribery incidence experienced by the business sector of a country.

1 World Governance Indicators. https://info.worldbank.org/governance/wgi/Home/Documents#wgiDataCrossCtry

3. Methodology

3.1 Sampling

The study is focused on a set of 39 countries in the European geographical region, as this gives us the right amount of heterogeneity among countries to explore the relationships between different variables. It also shows enough homogeneity in terms of geographical effects, and somewhat on the general level of development. The sample therefore consists of the European continent countries, covering the European Union and its periphery. Only a few European countries were not included in the analysis due to missing data (a list of countries with their EU membership and/or 'post-transition' status in the appendix).

3.2 Variable description

Bribery incidence (BribInc) is measured by the percentage of firms experiencing bribery payment requests. According to the World Bank Enterprise Survey data, seven out of ten firms in the analysed set of European countries experienced bribery requests (Table 1). Zero-level bribery incidence is observed in Estonia, Luxembourg, and Sweden, while in Ukraine, every third firm experienced at least one bribery payment request. To explain these large variations among countries, a set of independent variables is included in the regression models (Table 1).

Table 1 Descriptive statistics, n=39

Variable	Mean	Minimum	Maximum	Std. Dev.
BribInc	7.06	0.00	37.4	9.26
Trade	20.59	1.00	39.40	8.33
Public	0.75	0.00	2.80	0.80
EaseDB	75.60	65.44	85.29	4.62
GovExp	33.75	16.06	46.65	7.03
EU	0.62	0.00	1.00	0.49
PT	0.64	0.00	1.00	0.49

Source: Authors

As trade and public sectors are very prone to corruption, the share of trade companies (Trade) and public sector companies (Public) in the economy are taken as a proxy of the corruption risk that these sectors might bring to the national economy. The percentage of registered companies involved in wholesale and retail trade in our sample oscillates between 1 percent in Belarus and 39.4 percent in Montenegro. The share of registered companies in the public sector is the lowest in Belarus, Cyprus, Estonia and Romania, while the highest share is registered in Ukraine. Moreover, the mean value for central government expenses in GDP amounts to 33.8 percent, with the smallest and the largest values recorded in Kazakhstan and Greece, respectively.

Further, the share of central government expenses in the GDP (GovExp) is included to capture the corruption risk stemming from the government's influence on the national economy. The literature gives different results of the relationship between the size of the public sector and corruption (e.g. Goel and Nelson, 1998). A large public sector might create opportunities for corruption in public procurement, and generate nepotism, favouritism, and other forms of public power abuse which can, in turn, affect a private sector business. The size of the public sector varies across European countries ranging from central government expenditures share in GDP of 16 percent in Kazakhstan to almost 47 percent in Greece.

A possible negative effect of the size of the public sector on corruption pressure in business in a particular country might be alleviated by a favourable business environment (e.g. Vu et al., 2021). Therefore, the ease of doing business score (EaseDB) is included in the model to delineate regulatory performance of the countries included in the analysis and compare the regulatory environment for local entrepreneurs across countries. However, variations of the EaseDB score between the worst-per-

forming Bosnia and Herzegovina and the best-performing Denmark indicate this might explain the different levels of bribery incidence. If regulations in a country are unfair, non-transparent, and too restrictive, informal practices and corruption might serve as grease on the wheels.

From descriptive analysis of the variables listed above, it is evident that there are some differences between non-EU and post-transition countries compared to the EU member states and non-transition countries. To examine the influence of European Union membership and the transition past, we included dummy variables as additional regressors in the models. Here it is worth clarifying that 'post-transition' (PT) is used to denote countries whose economies completed the process of transformation from centrally planned to market economies, and/or countries still going through this process. The term 'post-transition' is used here to differentiate ex-socialist and socialist countries from old, established market economies.

A detailed description of all variables and sources is presented in Table 2.

Table 2 Variable definitions and data sources

Variable	Definition	Source
BribInc	Bribery incidence is measured by the percentage of firms experiencing at least one bribe payment request (2019 or 2020)	The World Bank. Enterprise Surveys. Available at: https://www.enterprisesurveys.org/en/custom-query
Trade	Percentage of registered companies that engage in wholesale and retail trade in an economy in comparison to other industries (2021 or the latest year available)	Hithorizons. Available at: https://www.hithorizons.com/eu/analyses/country-statistics
Public	Percentage of registered companies in the public sector in an economy in comparison to other industries (2021 or the latest year available)	Hithorizons. Available at: https://www.hithorizons.com/eu/analyses/country-statistics
EaseDB	The ease of doing business scores benchmark economies with respect to regulatory best practices, showing the proximity to the best regulatory performance on each Doing Business indicator. An economy's score is indicated on a scale from 0 to 100, where 0 represents the worst regulatory performance and 100 the best regulatory performance (2019)	The World Bank. Available at: https://data.worldbank.org/indicator/IC.BUS.DFRN.XQ
GovExp	Total central government expenditures (payments for operating activities of the government in providing goods and services), as a share of GDP (2020 or the latest year available)	Our World in Data. Available at: https://ourworldindata.org/government-spending#total-government-spending
EU	Dummy variable denoting European Union membership (0=non-EU member country; 1=EU member country)	European Union. Available at: https://european-union.europa.eu/principles-countries-history/country-profiles_en
PT	Dummy variable denoting a post-transition country (0=non post-transition country; 1=post-transition country)	International Monetary Fund. Available at: https://www.imf.org/external/np/exr/ib/2000/110300.htm

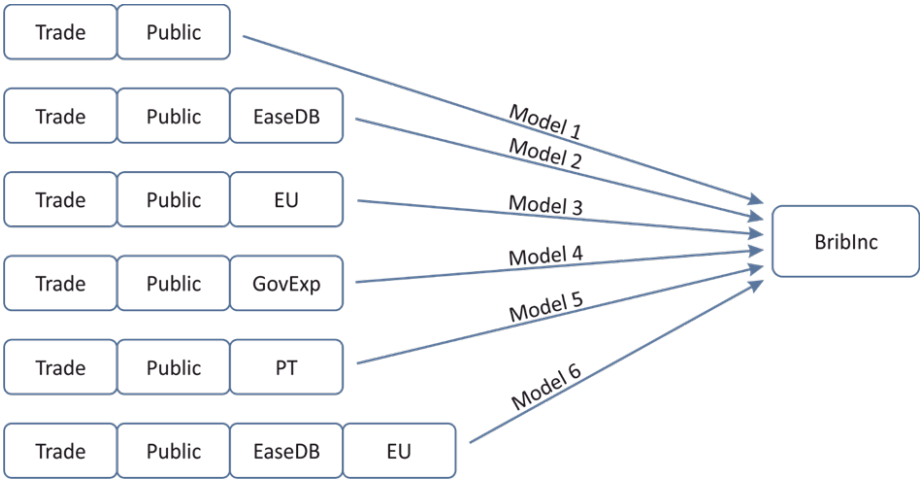
Source: Authors

3.3 Analytical procedure

A multiple regression analysis method was applied to investigate the determinants of corruption pressure on business. The analytical approach is based on the use of the indicators explained in the previous section in 39 countries. Six separate regres-

sion analyses were conducted to test hypotheses (Figure 1). In each model, the dependent variable was BribInc, while independent variables were as follows: Trade, Public (Model 1), Trade, Public, EaseDB (Model 2), Trade, Public, EU (Model 3), Trade, Public, GovExp (Model 4), Trade, Public, PT (Model 5), and Trade, Public, EaseDB, EU (Model 6). The variance inflation factors were checked to detect possible multicollinearity. Since the highest variance inflation factor (VIF) was 1.32, it was safe to conclude that multicollinearity did not exist. Data analysis was conducted with the Statistica 13 software package.

Figure 1 Regression models



Source: Authors

4. Results

A total of six regression analyses were conducted (Table 3). Variance inflation factor (VIF) values were calculated to check for multicollinearity in data. The calculated VIF values range between 1.05 and 1.32, indicating no multicollinearity.

Table 3 Regression analysis – dependent variable: BribInc

Independent variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Trade	0.39***	0.32**	0.28*	0.32**	0.35**	0.22
Public	0.32**	0.34**	0.22	0.32*	0.28*	0.25*
EaseDB		-0.33**				-0.32**
GovExp				-0.13		
EU			-0.36**			-0.34**
PT					0.15	
Model fit	R^2 = 0.317; F-value = 8.35; p = 0.001	R^2 = 0.424; F-value = 8.58; p = 0.000	R^2 = 0.416; F-value = 8.33; p = 0.000	R^2 = 0.319; F-value = 5.15; p = 0.005	R^2 = 0.334; F-value = 5.85; p = 0.002	R^2 = 0.513; F-value = 8.97; p = 0.000

*** significant at p<0.01 level; ** significant at p<0.05 level; * significant at p<0.1 level
Note: Standardised coefficients (β), n=39 (for Model 4, n=37).
Source: Authors' calculations

The results indicate that bribery incidents in the business sector are positively and significantly affected by the share of trade and public companies in the economy. The results also show that bribery incidents in the business sector are negatively and significantly affected by the ease of doing business in a country and EU membership. The size of the government in the national economy and the country's post-transition status are not significantly related to bribery incidents in the business sector.

5. Discussion

Our findings suggest that in the European countries with a larger share of companies in the trade sector, the entire business sector is exposed to higher corruption pressure, which implies a spillover of the negative effect of bribery practices from trade to the entire business sector. Adding the same effect of a large share of public companies in the country's company structure, it looks like national economies have problems with endemic corruption due to persisting corruption rent-seeking in trade and public sectors. Public companies may act here as bribe-seekers in their business operations with the private sector, but may as well be exposed to bribery requests coming from private firms. Public companies, as well as the whole public sector, are particularly vulnerable to corruption because control mechanisms in public companies are considered weak in comparison to those in private firms. Management of public companies might be selected on the basis of political affiliation instead of merit-based criteria.

Most studies claim that corruption negatively affects a business environment and only a few studies examined the interdependency of variables "corruption" and the "ease of doing business". Monray and Filipescu (2012) showed that a favourable business environment goes hand in hand with less corruption, but apart from a high degree of interdependency. As research into the impact of a business environment on corruption is scarce, results are worthy of further discussion. Our analysis showed that a favourable doing business environment successfully mitigates corruption risks because there is no need for bribery to grease the wheels. Lash and Batavia (2019) found that out of all components of the World Bank Doing Business, (bad) regulation indicators increased the level of corruption, while (poor) legal doing business indicators contributed to corruption to a much lesser extent. This suggests that appropriate by-laws and implementation of regulations matter more in terms of tackling corruption than formally adopted laws, which is often the issue in countries with transition experience. On the contrary, in the EU member states, incentives for bribery are lower, probably due to stronger control mechanisms in public procurement, higher business professional standards, efficient administration services for business, and the rule of law.

Due to the endemic nature of corruption, its contagious effect has been evidenced in the studies. Becker et al. (2009) identified contagious effects of corruption among regions and countries, while Cheng (2011) elaborated that corporate governance failures that lead to corruption in one firm spill over to other firms. Therefore, it is reasonable to assume that such contagious effects could be observed in the national economy due to the spillover of bribery practices from one sector to another.

6. Concluding remarks, limitations, and lines of future research

The main contribution of this paper is an examination of the relationship between the structure of the economy and bribery incidents in selected European countries.

Motivated by the high corruption risk evidenced in retail and wholesale trade and public sectors, we explored whether bribery incidence reported by all companies is higher within the European economies with a larger share of companies in these two sectors. The findings indicate that the share of retail and wholesale trade and public companies is indeed related to bribery incidence experienced in the national business sector as a whole. Still, it remains unknown if the share of wholesale vs. retail within the trade sector makes a difference and in what timespan the changes occur. Furthermore, since institutions change slowly, it is hard to estimate how long it would take for corruption pressure to diminish once a country becomes an EU member state. The contagious effect of corruption is underexplored, thus leaving many open questions and room for further research.

Our results are in line with the previous findings on trade and public sectors that are very susceptible to corruption. However, in accessing a new group of determinants of bribery incidence, we have re-

alised that its spillover from the most corrupt business sectors (trade and public sectors) to the entire business sector of a country is possible. Perhaps the higher rates of corruption are due to corruption in respective retail and public sectors. Nevertheless, the findings on the relationship between the share of retail and wholesale trade and public companies in an economy and bribery incidence experienced by the entire business sector further indicate that there might exist a transmissible effect of bribery that spills over from one sector to the rest of the companies. This novel finding needs more evidence-based confirmation. We believe that our research would trace the way for further research into this spillover phenomenon.

As far as policy recommendations are concerned, improving the ease of doing business and speeding up the process of EU accession seem to improve good governance in the new EU member states and prevent corruption in the long run, which could further reduce the spread of corruption risk.

6.1 Limitations and further research

This study is not without limitations. First, it is conducted by using secondary macro-level data. Hence, future research might include survey-based micro-level data to better capture the observed effects. Second, this study has been conducted on a group of European countries; however, the lack of available data prevented us from including all countries of the European continent. To improve the generalisability of results, further studies should be conducted for other regions and on a larger, global scale, include non-European countries as well.

Our study has been conducted at a single point in time. Future research studies might be conducted over a period of time, by using a longitudinal research approach. In that way, the observed effects and possible changes in the relationship between variables could be determined and further explained. This study paves the way for further research into the corruption transmission effect across business sectors. The mechanisms and the size of spillover effects should be empirically validated to provide a sound basis for the theoretical contributions in the field of the economics of corruption.

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Appendix 1 *Countries in the sample*

No.	Country	EU member and/or post-transition country (EU/PT)
1	Albania	PT
2	Armenia	PT
3	Austria	EU
4	Azerbaijan	PT
5	Belarus	PT
6	Belgium	EU
7	Bosnia and Herzegovina	PT
8	Bulgaria	EU/PT
9	Croatia	EU/PT
10	Cyprus	EU
11	Czech Republic	EU/PT
12	Denmark	EU
13	Estonia	EU/PT
14	Finland	EU
15	Georgia	PT
16	Greece	EU
17	Hungary	EU/PT
18	Ireland	EU
19	Italy	EU
20	Kazakhstan	PT
21	Kosovo	PT
22	Latvia	EU/PT
23	Lithuania	EU/PT
24	Luxembourg	EU
25	Malta	EU
26	Moldova	PT
27	Montenegro	PT
28	Netherlands	EU
29	North Macedonia	PT
30	Poland	EU/PT

No.	Country	EU member and/or post-transition country (EU/PT)
31	Portugal	EU
32	Romania	EU/PT
33	Russia	PT
34	Serbia	PT
35	Slovakia	EU/PT
36	Slovenia	EU/PT
37	Sweden	EU
38	Turkey	EU
39	Ukraine	PT

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LIQUIDITY MANAGEMENT IN SMALL AND MEDIUM-SIZED CONSTRUCTION ENTERPRISES DURING CRISIS - THE CASE OF CROATIA

Abstract

Purpose: The aim of this study is to investigate the effects of liquidity management on the profitability of small and medium-sized Croatian enterprises during the economic crisis of 2008 and the crisis caused by COVID-19 and provide empirical evidence of the effects of liquidity management on profitability.

Methodology: The collected data were analyzed using the methods of descriptive statistics, chain and base indices as well as Spearman's correlation coefficient, while the normality of the distribution of the selected sample of small and medium-sized enterprises was examined with the Shapiro-Wilk W test.

Results: According to the research results, the economic crisis in the period from 2008 to 2014 had more pronounced negative effects on liquidity management of the observed companies than the economic crisis in the conditions of the COVID-19 pandemic.

Conclusion: The research results showed that liquidity management and achieving adequate profitability in times of crisis are very important for small and medium-sized construction companies because their total assets are dominated by short-term assets, while short-term liabilities are their dominant source of funding so better education in the field of finance is recommended in order to understand the use of their own and others sources of funding.

Keywords: Economic crisis, COVID-19 crisis, liquidity management, profitability, small and medium-sized construction enterprises

1. Introduction

Economic crises have serious consequences for many economies and business activities of enterprises in all sectors, directly affecting their profitability and liquidity. Liquidity is especially important in times of crisis when business activities performed by a company slow down and lower revenues are generated, which is also reflected in cash flows. In addition, companies have a problem

with the conversion of their receivables into liquid assets, which makes it difficult for them to pay their due obligations. Liquidity management and achieving adequate profitability are very important for small and medium-sized enterprises because their total assets are dominated by short-term assets and, as shown in this study, short-term liabilities are the dominant source of funding.

In addition to presenting theoretical knowledge of the economic crisis and the COVID-19 crisis, the main goal of this research is to empirically investigate and analyze the relationship between liquidity management and profitability of Croatian small and medium-sized enterprises in construction during the economic crisis and the COVID-19 crisis.

The construction sector is extremely important for the entire economy as it significantly contributes to gross domestic product through employment and encouraging the development of other activities, among which Bogdan (2020) highlights the construction materials industry, non-metals, wood, furniture and chemical industries. For the last 20 years, the Croatian construction sector has been going through a period of great expansion from 2000 to 2008, a period of recession from 2009 to 2014, and a period of stabilization and the beginning of growth that lasted from 2015 to 2020. In the period from 2000 to 2008, according to the Central Bureau of Statistics, the share of construction in GDP increased from 3.9% in 2000 to 6.5% in 2008. In that period, large infrastructure projects were built in the field of road construction and the residential real estate market grew, which resulted in the growth of construction activity and reflected on the overall economic growth in the country. Most of these activities were financed by expensive borrowing abroad, and as the economic crisis halted the flow of capital, investment activity in the construction sector declined.

During the economic crisis (2008-2014), many construction enterprises stopped operating, so the share of construction in GDP gradually decreased from 6.5% in 2008 to 3.6% in 2014. A gradual recovery started in 2015 and the accelerated growth in 2018, which is also shown by the share of construction in GDP of 4.0% and 4.4% in 2019. The growth trend continued in 2020, when, according to the latest available, although preliminary data, the construction industry had a share of 5.1% in GDP (Croatian Bureau of Statistics, 2021a).

Although, according to data provided by the Croatian Bureau of Statistics, the number of active construction companies increased in the observed period, they recorded a continuous decrease in total revenue from 2008 to 2013. Total revenue has been continuously increasing since 2014.

Both the 2008 economic crisis and the COVID-19 crisis caused a global crisis with global consequences for national economies. Although they have similar proportions, there are some differences between them. Thus, for example, in the Croatian construction sector during the crisis caused by the COVID-19 pandemic, total revenue increased in 2019 and 2020, while during the period of the economic crisis it decreased until 2013. Furthermore, investments were still present in the construction sector in the period of the pandemic, in contrast to the crisis of 2008, when investments were reduced drastically. The reconstruction of the earthquake-affected areas of Zagreb and Banovina will certainly contribute to the growth of the construction sector in Croatia in the coming period.

The research results presented in this paper provide a scientific contribution to economic sciences in a theoretical and applied sense. By studying the available literature, a small number of papers dealing with construction companies were observed, so this research aimed to contribute to this issue. Previous research into the impact of the 2008 economic crisis and the COVID-19 crisis on the operations of construction companies is presented as part of the theoretical scientific contribution. As far as is known, no study has been conducted that would compare liquidity and profitability management of small and medium-sized construction companies during the COVID-19 crisis with the previous economic crisis based on empirical research, which makes a contribution to economic sciences. Previous research on the impact of the COVID-19 crisis or the economic crisis on the business of small and medium-sized enterprises has been mainly conducted through surveys or questionnaires.

After the introduction, the second section presents theoretical assumptions of research on the economic crisis and the COVID-19 crisis, as well as research on determining the relationship between liquidity and profitability of small and medium enterprises in the construction sector. The third section lists research questions, research methodology, and the empirical research results. Finally, the obtained results are synthesized, recommendations

for further research are given, and research limitations are described in the last part of the paper, i.e. the conclusion.

2. Literature review

2.1 Economic crisis

At the end of 2008, the world economy faced a financial crisis that hit financial and national markets through the so-called mortgage or bad credit crisis, which spread to the economies of many countries due to globalization. It has had a number of consequences for economic systems, where economically stronger and more independent countries have recovered much faster from the effects of the crisis. The economic crisis strongly affected the construction industry (Nafday, 2011), which is characterized by a pro-cyclical industry and is moving in line with economic trends. In the construction industry, financing was difficult during the economic crisis and there was a reduction in the construction market and profit margins due to strong competition (Zuo et al., 2015).

Fadhil and Burhan (2021) deal with the effects of the economic crisis on construction projects in Iraq in their study, where they state that contractors extended construction deadlines because they failed to collect their claims from the state due to its illiquidity or incapacity, and Barmpas (2018) points out that illiquidity caused bankruptcy of a large number of construction companies in Greece. Those companies that used their own funds to finance the construction of apartments for the market have previously become illiquid (Barbalić & Dunović, 2015). The volume of construction work in Croatia has been steadily declining since the beginning of the global economic crisis, as large state-funded projects have been absent, and unfavorable labor market developments have caused a decline in real estate demand (Buturac, 2014).

The consequences of the 2008 crisis have long been felt in the construction sector. The first signs of recovery in construction activity in the Republic of Croatia were registered in 2015, and the highest growth rate of construction work since 2008 was recorded in 2018 (Bogdan, 2020). In 2017, there was an increase in construction activities in the sectors of tourism, transport and industry due to the construction of hotels, transport and communication buildings and industrial buildings and warehouses (Buturac, 2018). The 2008 crisis in the construction sector resulted in the disappearance of the largest construction companies, so their large-scale construction work was taken over by foreign companies.

2.2 COVID-19 crisis

The COVID-19 crisis has severely disrupted the economy with devastating effects on global trade, affecting households, businesses, financial institutions and various industries. Unlike the economic crisis that began in the financial sector, the COVID-19 crisis stems from a health crisis and ways to control that pandemic.

The economic effects of the coronavirus pandemic quickly caught the attention of global and domestic economists who investigated the impact of the COVID-19 pandemic, which affected all economies regardless of their size and development (Barua, 2020), and many businesses and individuals around the world by reducing consumption (Baldwin & Mauro, 2020). The crisis caused by the COVID-19 virus has caused increasing uncertainty because there are no close parallels from economic history to compare with (Baker et al., 2020), and has set a precedent in the history of economic crises due to supply and demand shocks in all industries, as well as imposed travel bans inside and outside the country by some countries (Jeffery, 2020).

Based on a survey conducted on 358 respondents from the real sector and public administration, Roška et al. (2021) analyzed the impact of the pandemic on the Croatian economy through a decrease in employment, a decline in GDP and the number of years needed for its recovery. Respondents stated that they expected a reduction in employment in the coming years and that the crisis caused by the COVID-19 pandemic was far more devastating to the economy than the 2008 economic crisis.

There are numerous papers examining the impact of COVID-19 on various economic aspects such as the analysis of the impact on consumption in retail trade (Končar et al., 2020), the analysis of effects on export competitiveness (Stojčić, 2020), and the analysis of the impact of the pandemic on micro, small and medium enterprises in Kenya (Kaberia & Muathe, 2020) or in China (Sun et al., 2021). Numerous studies have also been conducted to examine the impact of the COVID-19 pandemic on the construction industry. The COVID-19 pandemic has had a significant impact on the construc-

tion sector, which is sensitive to economic cycles (Domac, 2020; International Labour Organization, 2021), but which has a lot of potential to foster recovery through employment opportunities (PWC, 2021). Prior to the COVID-19 pandemic, the construction industry needed to increase productivity, improve project performance and find workforce. In addition to the cessation of construction due to restrictions on movement and lack of supply, increased construction costs due to current costs necessary to maintain business were the consequences of the pandemic for the construction sector (Gamil & Alhagar, 2020), which occurred in construction companies in Africa, Asia and Europe (Ogunnusi et al., 2020).

Some authors have compared the impact of the economic crisis and the crisis caused by the COVID-19 virus on the economy. Thus, for example, Li et al. (2021) compared the impact of the crisis caused by the COVID-19 virus and the economic crisis of 2008 on the macroeconomic variables of the US economy. They concluded that structural problems in the US economy pointed to a crisis unlike the crisis caused by the virus COVID-19, which surprised the US economy due to its characteristics, which then limited movements and even closed companies in the first two quarters of 2020 due to extreme contagion.

Santos et al. (2021) conducted a survey on the financing of EU companies during the economic crisis and the COVID-19 crisis, in which the respondents said that their biggest problem during the 2008 economic crisis was access to finance which was followed by finding customers. At the time of the pandemic, their biggest problem was mobility/travel restriction, followed by closure and lack of staff (absence and sick leave) and finding customers, which was also the case during the economic crisis.

2.3 Liquidity and profitability

Maintaining the liquidity of a company and achieving profitable growth are among the most important tasks of management. A company is liquid when it is able to convert its current assets into cash and cash equivalents that should be sufficient to cover its liabilities within one year. The goal of corporate management is to achieve the highest possible profitability and in this context to determine the possibility of the impact of liquidity on profitability.

There is a significant amount of scientific research aimed at determining a correlation between liquidity and profitability. The research focused on a specific industry, a specific geographical area or the company size criterion. For example, Lamberg & Valming (2009) investigated the impact of liquidity and profitability of Swedish small and medium-sized enterprises during the economic crisis and concluded that liquidity has a significant impact on corporate profitability and that more short-term investments can increase profitability.

Furthermore, Saleem & Rehman (2011) examine a correlation between liquidity and profitability and their research results indicate that there is a correlation between a certain amount of liquid assets and the profitability of Pakistani companies in the oil and gas industry, after which keeping liquid assets with a high degree of liquidity negatively affects profitability. Bolek & Wilinski (2012) found in their research that liquidity affects the profitability of construction companies listed on the Warsaw Stock Exchange, and Mamić Sačer et al. (2013) also found a positive correlation between liquidity and profitability in a sample of Croatian medium and large IT companies.

However, unlike the aforementioned research, the results of a number of studies on this issue indicate the existence of a negative correlation between liquidity and profitability of a company. Thus Raykov (2017) investigates the interdependence of liquidity and profitability on a sample of 20 companies listed on the Bulgarian Stock Exchange in the period from 2007 to 2015, where the analysis found a negative correlation between liquidity and profitability. This is also the case in the research conducted by Kontuš & Mihanović (2019) on small and medium enterprises in Croatia, where they found a negative correlation between the level of liquidity measured by the ratio of current assets to current liabilities and profitability measured by return on assets (ROA).

The construction industry has not been researched in a similar way so far, so this paper deals with the area of liquidity and profitability of this branch of activity by comparing the consequences of the COVID-19 crisis with the previous economic crisis.

3. Research

3.1 Methodology and research questions

This part of the paper presents the results of an empirical study conducted on a representative sample of Croatian small and medium enterprises from the construction industry by comparing their liquidity during the crisis caused by the COVID-19 pandemic and the economic crisis. The aim of this paper is to provide empirical evidence of the effects of liquidity management on the level of profitability during the COVID-19 crisis, which refers to the period from 2019 to 2020, and the period of economic crisis from 2008 to 2014 and from 2015 to 2018, in order to determine the possible consequences of the economic crisis on their operations.

After determining the sample of small and medium-sized enterprises in the construction industry (for more details, see 3.1.1), financial data on their operations were collected from the FINA database, the Register of Annual Financial Statements, for all thirteen years: 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 and 2020.

The collected data were analyzed using descriptive statistics methods and Spearman's correlation coefficient, while the normality of the distribution of the selected sample of small and medium enterprises was examined by the Shapiro-Wilk W test.

In the empirical analysis, the current liquidity ratio (the ratio of current assets to current liabilities) and the accelerated liquidity ratio (the ratio of current assets less inventories to current liabilities) were used to calculate liquidity. Indebtedness of the company was examined using the indebtedness indicator (the ratio of total liabilities to balance sheet assets), while profitability was examined using the return on assets (ROA) indicator, which is calculated as the ratio of profit after tax to balance sheet assets (Helfert, 1997).

In order to respond to the set goal of the paper, the following research questions were raised:

RQ1: How did the economic crisis in the period from 2008 to 2014 affect liquidity management of selected construction companies?

RQ2: Have the consequences of the economic crisis been felt after 2014??

RQ3: How did the crisis caused by the COVID-19 virus affect liquidity management of selected companies from the construction industry?

RQ4. What conclusions can be drawn from the conducted research?

3.1.1 Sample description

In order to meet the research objectives and answer the research questions, the research is focused on small and medium enterprises from the construction sector of the City of Zagreb and Zagreb County, which form the research sample. The reason for choosing the City of Zagreb is the largest number of active construction companies (4,256), while Zagreb County was chosen because of geographical proximity of the county to the City of Zagreb and because it has 1,317 active companies. These companies make up 33.7% of the total number of active construction companies in the Republic of Croatia (Croatian Bureau of Statistics, 2021b).

The initial sample, which includes 900 small and medium-sized enterprises from the construction industry, was selected from this group at random. After excluding companies that did not submit annual financial statements for each of the observed years in the period from 2008 to 2020, as well as those companies that showed extreme or inconsistent figures in any variable, a final sample of 41 small and medium-sized enterprises was made.

3.2. Empirical analysis results and discussion

3.2.1 Descriptive analysis of construction companies

Based on the information on the operations of the observed small and medium-sized companies in the construction industry for the period from 2008 to 2020, current and accelerated liquidity indicators, indebtedness and return on assets (ROA) indicators, and the share of short-term liabilities in total liabilities of the balance sheet were calculated for each company. The average annual values of the selected indicators of the observed companies were used for further analysis.

Table 1 presents the average annual current and accelerated liquidity indicators, as well as chain and base indices for the observed small and medium-sized companies in the construction industry in the period from 2008 to 2018.

Table 1 Average current and accelerated liquidity indicators, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Current liquidity ratio	1.4899	1.8713	1.9570	1.7499	1.5554	1.6784	1.7897	1.7590	2.0228	2.1091	2.0682
Chain index		125.60	104.58	89.42	88.89	107.91	106.63	98.28	115.00	104.27	98.06
Base index (2008=100)	100.00	125.60	131.35	117.45	104.40	112.65	120.12	118.06	135.77	141.56	138.81
Accelerated liquidity ratio	1.3280	1.6059	1.6003	1.5323	1.3325	1.4460	1.5951	1.5590	1.7911	1.9272	1.9045
Chain index		120.93	99.65	95.75	86.96	108.52	110.31	97.74	114.89	107.60	98.82
Base index (2008=100)	100.00	120.93	120.50	115.38	100.34	108.89	120.11	117.39	134.87	145.12	143.41

Source: Authors' calculation

In the period of economic crisis (2008-2014), the average value of current liquidity indicators of the observed small and medium-sized enterprises is less than 2, which indicates their illiquidity. As in the period from 2008 to 2014 the current liquidity ratio was less than 2, and the accelerated liquidity ratio was greater than 1, this indicates poor inventory management, which affects a company's liquidity. A high value of the accelerated liquidity ratio, which is calculated as the ratio of current assets reduced by inventories and short-term liabilities, indicates that companies have on average high amounts of uncollected receivables in the structure of current assets.

Tables 2 and 3 show the average indebtedness indicator and the average share of short-term liabilities in assets, as well as the calculation of chain and base indices of the observed small and medium-sized construction enterprises in the period from 2008 to 2018.

Table 2 Average indebtedness indicator, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Indebtedness indicator	0.6698	0.6484	0.6315	0.6921	0.6862	0.6550	0.6098	0.5686	0.5234	0.5155	0.5152
Chain index		96.81	97.39	109.60	99.15	95.45	93.10	93.24	92.05	98.49	99.94
Base index (2008=100)	100.00	96.81	94.28	103.33	102.45	97.79	91.04	84.89	78.14	76.96	76.92

Source: Authors' calculation

Based on the calculation shown in Table 2, it can be seen that during the economic crisis, the observed companies mostly financed their assets from other sources, which can be seen from the calculated average indebtedness indicator ranging from 0.6098 to 0.6921. The highest indebtedness was recorded in 2011, when 69.21% of total assets were financed from other sources, and it was slightly lower in 2012. In the years after the economic crisis, indebtedness had a decreasing trend, but the average indebtedness indicator was still greater than 0.50.

Table 3 Average share of short-term liabilities in assets, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Share of short-term liabilities (%)	61.02	54.19	53.85	61.28	63.54	58.29	53.41	50.15	46.39	45.10	45.56
Chain index		88.81	99.37	113.80	103.69	91.74	91.63	93.90	92.50	97.22	101.02
Base index (2008=100)	100.00	88.81	88.25	100.43	104.13	95.53	87.53	82.19	76.02	73.91	74.66

Source: Authors' calculation

A high share of short-term liabilities in sources of assets indicates the large reliance of small and medium-sized companies on short-term sources of financing, especially in the period from 2008 to 2014, but also in the period from 2015 to 2018.

Table 4 shows the average profitability indicators (ROA), as well as the chain and base indices of the observed small and medium-sized construction companies in the period from 2008 to 2018.

Table 4 Average return on assets (ROA) profitability indicator, chain and base indices in the period 2008-2018

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
ROA	0.1065	0.0979	0.0699	0.0731	0.0810	0.0725	0.0643	0.0641	0.0916	0.1057	0.0932
Chain index		91.92	71.40	104.58	110.81	89.51	88.69	99.69	142.90	115.39	88.17
Base index (2008=100)	100.00	91.92	65.63	68.64	76.06	68.08	60.38	60.19	86.01	99.25	87.51

Source: Authors' calculation

In the period of economic crisis, the average return on assets (ROA) had a decreasing trend, but it has been increasing since 2016, and in 2017 it was approximately at the level of 2008.

The following table shows an overview of average current and accelerated liquidity indicators, average indebtedness indicators, average return on assets (ROA) indicators, as well as the average share of short-term liabilities in the total liabilities of the balance sheet of small and medium-sized construction companies in 2019-2020.

Table 5 Average indicators of current liquidity, accelerated liquidity, indebtedness and ROA and the average share of short-term liabilities in balance sheet liabilities in the period 2019-2020

	Current liquidity ratio	Accelerated liquidity ratio	Indebtedness indicator	Share of short-term liabilities (%)	ROA indicator
2019	2.1530	2.0095	0.5258	43.37	0.1041
2020	2.4999	2.3296	0.4801	38.06	0.1173

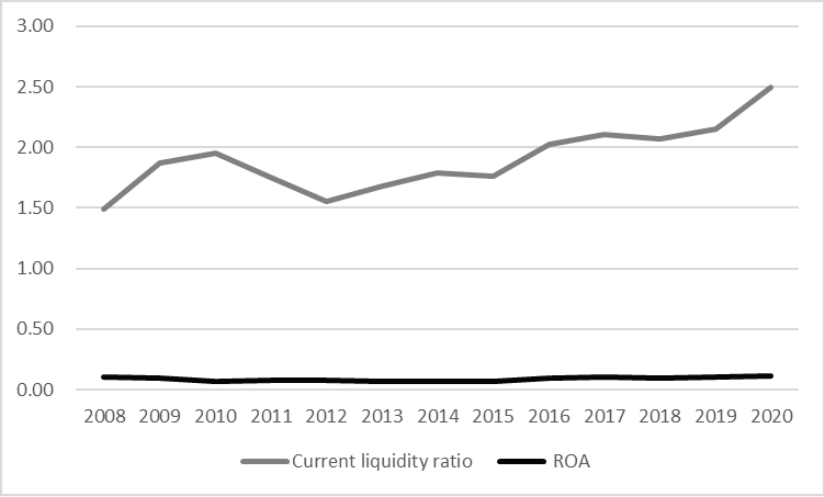
Source: Authors' calculation

According to the average value of current liquidity indicators and the average value of accelerated liquidity indicators, it can be concluded that the observed small and medium companies did not have liquidity problems. But a high average value of accelerated liquidity ratios could potentially indicate problems with inventories or high outstanding receivables. In 2019, small and medium-sized enterprises financed 52.58% of their total assets with debts, most of which were short-term liabilities, which was also the case in 2020, except that the average indebtedness indicator was slightly lower, as well as the share of short-term liabilities in balance sheet liabilities. Based on the calculations, it

was determined that the average profitability of the property return indicator increased in 2020 compared to the previous year.

As shown in Figure 1, the research continued by examining the liquidity and profitability of small and medium-sized enterprises in the sample during the period of the economic crisis of 2008 and the COVID-19 crisis.

Figure 1 Comparison of liquidity and profitability during the period of economic crisis and the COVID-19 crisis



Source: Made by authors

A comparison of the average value of current liquidity indicators at the beginning of the economic crisis and the crisis caused by the pandemic (2020) shows that the observed small and medium enterprises were not liquid at the beginning of the economic crisis, unlike the beginning of the crisis caused by the COVID-19 crisis. Moreover, at the time of the onset of the pandemic, the average value of the ROA profitability indicator was 1.08 percentage points higher than at the time of the onset of the economic crisis.

Tables 6 and 7 show descriptive statistics of average current and accelerated liquidity indicators, indebtedness and profitability indicators, as well as the share of short-term liabilities in balance sheet liabilities during the economic crisis and the COVID-19 crisis.

Table 6 Descriptive statistics of the observed variables (current liquidity, accelerated liquidity, indebtedness, share of short-term liabilities in balance sheet liabilities and ROA) for the period 2008-2014

	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.	Coef.Var.
Current liquidity ratio	41	1.727369	1.215635	0.475907	4.865366	1.111587	64.35144
Accelerated liquidity ratio	41	1.491436	1.132203	0.066743	4.708903	1.125709	75.47819
Indebtedness indicator	41	0.656128	0.675428	0.196335	0.972979	0.209949	31.99819
Share of short-term liabilities (%)	41	0.579388	0.625193	0.115401	0.972979	0.229417	39.59652
ROA indicator	41	0.080732	0.062586	0.002930	0.299088	0.070586	87.43197

Source: Authors' calculation

Table 7 Descriptive statistics of the observed variables (current liquidity, accelerated liquidity, indebtedness, share of short-term liabilities in balance sheet liabilities and ROA) for the period 2019-2020

	Valid N	Mean	Median	Minimum	Maximum	Std.Dev.	Coef.Var.
Current liquidity ratio	41	2.326443	1.980418	0.771925	6.840467	1.418554	60.97525
Accelerated liquidity ratio	41	2.169539	1.855686	0.100308	6.425824	1.430802	65.94957
Indebtedness indicator	41	0.502928	0.478876	0.138025	0.895904	0.232084	46.14658
Share of short-term liabilities (%)	41	0.407150	0.342055	0.061614	0.895904	0.218896	53.76310
ROA indicator	41	0.110696	0.077666	0.007637	0.380655	0.093897	84.82382

Source: Authors' calculation

3.2.2 Relationship between liquidity level and profitability

The next part of the research is focused on examining the existence of a relationship between the level of liquidity expressed through the ratio of current assets and short-term liabilities, and the profitability expressed in return on assets (ROA). The dependence between average liquidity and average profitability was analyzed by Spearman's correlation coefficient in the observed small and medium companies in the construction sector for each year.

The distribution normality of current liquidity and profitability indicators for each observed year was tested using the Shapiro-Wilk W test as it is a small sample. Since for both indicators in each of the observed periods $p<0.05$, it can be concluded that there is no statistically significant probability that the observed sets have a normal distribution. After testing the distribution normality, the Spearman correlation coefficient was used to analyze the relationship between average liquidity and average profitability.

Table 8 shows the correlation coefficients between the level of liquidity and profitability by year for construction small and medium-sized enterprises during the period from 2008 to 2020.

Table 8 Correlation coefficient between liquidity and profitability level 2008-2020

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
R	0.5700	0.7174	0.5879	0.7219	0.6087	0.5611	0.5221	0.4298	0.4023	0.5631	0.5516	0.5305	0.5307
p	0.0001*	0.0000*	0.0000*	0.0000*	0.0000*	0.0001*	0.0004*	0.0050*	0.0091*	0.0001*	0.0002*	0.0004*	0.0004*

*significant at the level of $p<0.05$
Source: Authors' calculation

The correlation analysis of liquidity and profitability in small and medium-sized enterprises by individual years within the observed period from 2008 to 2020 shows that in each of the observed years there is a statistically significant positive correlation between the observed variables. For most of the observed periods, the Spearman correlation coefficient shows a statistically significant medium-strong positive correlation between the level of liquidity and profitability, which means that an increase in liquidity affects an increase in profitability. Only in the case of 2015 and 2016, a slightly lower correlation coefficient was calculated, which shows a statistically significant weak correlation between the observed variables.

The research also includes examination of the correlation between the level of liquidity and profitability according to the average values of the observed indicators in the period of economic crisis and the COVID-19 crisis, which are shown in tables 10 and 11. The Shapiro-Wilk W test was used to test the normality of the distribution of the selected set, which is shown in Table 9.

Table 9 Shapiro-Wilk W test

	Shapiro-Wilk W	p
Current liquidity ratio 2008-2014	0.81718	0.00001
ROA indicator 2008-2014	0.90070	0.00174
Current liquidity ratio 2019-2020	0.88074	0.00047
ROA indicator 2019-2020	0.87684	0.00037

Source: Authors' calculation

Table 9 shows that, with a significance level of 95%, there is no statistically significant probability that the observed sets have a normal distribution as $p<0.05$ in all four observed sets.

Table 10 Correlation coefficient between the level of liquidity and profitability according to the average values for the period 2008-2014

Pair of variables	Spearman Rank Order Correlations MD pairwise deleted; Marked correlations are significant at p<.05000			
	Valid N	Spearman R	t(N-2)	p-value
TL 08-14 & ROA 08-14	41	0.732578	6.721121	0.000000

*significant at the level of $p<0.05$
Source: Authors' calculation

The calculation of the correlation coefficient between the level of current liquidity and profitability according to the average values of the above indicators for the period from 2008 to 2014 shows that there is a statistically significant medium-strong positive correlation between the observed variables.

Table 11 Correlation coefficient between liquidity and profitability levels according to average values in the period 2019-2020

Pair of variables	Spearman Rank Order Correlations MD pairwise deleted; Marked correlations are significant at p<.05000			
	Valid N	Spearman R	t(N-2)	p-value
TL 19-20 & ROA 19-20	41	0.589547	4.558085	0.000050

*significant at the level of $p<0.05$
Source: Authors' calculation

The calculation of the correlation coefficient between the level of current liquidity and profitability according to the average values of these indicators for the period from 2019 to 2020 shows that there is a statistically significant medium-strong positive correlation between the observed variables.

4. Conclusion

The primary purpose of this study was to analyze liquidity management of Croatian small and medium-sized companies in the construction industry during the 2008 economic crisis and the crisis caused by the COVID-19 pandemic. According to

the results of the research, it was determined that the economic crisis in the period from 2008 to 2014 had more pronounced negative effects on liquidity management of the observed companies than the economic crisis in the conditions of the COVID-19 pandemic. Recovery of small and medium-sized construction companies after the economic crisis has been going on since 2015, when their liquidity and profitability increased, while indebtedness and short-term debt, which is still high, decreased.

Throughout the analyzed period, a high average value of the accelerated liquidity ratio was observed, which potentially indicates high values of uncollected receivables in the structure of current assets. The study also found high inventory values that were higher during the 2008 economic crisis than during the pandemic. Better inventory and receivables management would allow companies to improve their liquidity because they could then meet their obligations on time. Comparing the average indicators of return on assets (ROA) in the period of economic crisis and pandemic, it can be seen that in the period of economic crisis there was a decreasing trend, while an increasing trend was recorded in the period of pandemic. Greater negative effects of the economic crisis on the operations of small and medium-sized construction companies can also be seen in their indebtedness, because in the period of economic crisis the total indebtedness was greater than in the pandemic period, as well as financing assets from short-term sources.

The research results presented in this paper will be useful to small and medium enterprises in Croatia in terms of a better understanding of the importance of liquidity management, which is especially evident in times of crisis.

Research limitations: The limitation existed at the time of data collection because small and medium-sized enterprises were obliged to submit financial reports to FINA only since 2008, so it was not possible to conduct analysis in the year before the economic crisis. Furthermore, small enterprises submit to FINA condensed financial statements that are less elaborate and have less data than the financial statements of medium and large enterprises, which was a limitation to a more detailed analysis. A potential limitation of the research is the use of average annual values of indicators for the observed companies, which can affect the reliability of the results.

Research recommendations: Future research on the impact of the crisis on liquidity management of small and medium-sized enterprises in the construction industry should expand the theoretical framework on the COVID-19 crisis, as it is assumed that there will be more work on the impact of the COVID-19 crisis on business operations. Furthermore, given that research on the impact of the COVID-19 crisis is conducted on a short-term series, and the pandemic is still ongoing, longer time series should be considered. In addition, this paper initiates further research on the impact of the crisis on the operations of small and medium-sized enterprises in other industries, as well as the expansion of research to other Croatian regions. This research has also shown that small and medium enterprises mostly finance their assets from short-term sources, so better education in the field of finance is recommended for them in order to understand the use of their own and other sources of financing.

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RESOURCE-BASED ECONOMY – DETERMINANTS OF ECONOMIC GROWTH AND SUSTAINABLE DEVELOPMENT IN SAUDI ARABIA

Abstract

Purpose: This paper examines the determinants of long-term economic growth and sustainable development of the Kingdom of Saudi Arabia as a chosen one-resource economy that relies on massive oil production.

Methodology is based on the econometric methods of multiple regression analysis and the multicollinearity test for the period from 2010 to 2020. The research was conducted on the basis of a model of 13 variables, where the dependent variable is the annual rate of GDP, and the independent variables are inflation, budget deficit, oil exports, imports, unemployment rate, foreign direct investment, labour productivity, public debt, labour force, GDP per capita, HDI index, total rent of natural resources and adjusted net savings.

Results indicate a strong connection between gross domestic product and the selected variables and the existence of factors that are of strategic importance for the growth of the Saudi economy, but on the other hand, the negative effects of certain factors on sustainable development.

Conclusion: Based on the results, it is suggested that investment in human capital is an urgent step to achieve long-term sustainability and reduce reliance on natural resource operations in the future.

Keywords: Resource-based economy, economic growth, sustainable development, Saudi Arabia

1. *Introduction*

In theory, countries whose natural resources make up more than 10% of GDP, or 40% of exports, are considered single-resource economies. Although certain indicators of economies that possess natural resources confirm economic growth and development, the question is whether the same growth can encompass sustainable development in the long term, depending on the determinants of economic activity measurement. Economic growth and development are complex macroeconomic terms. Long-term economic growth represents a continuous increase in production over a longer period of time (more than 10 years), and economic development represents an increase in the quality of life of resi-

dents and business operations of economic entities and institutions. It is assumed that the planet Earth abounds in resources; however, the long-standing human practice of rationing with economic measures is counterproductive for the long-term survival of resources. The new society has access to advanced technology that can provide the use of some non-renewable resources and develop the supply of those resources that potentially do not jeopardise human life and economic development, and do not destroy the Earth's surface. However, such an efficiently designed economy that would give each individual the opportunity to coexist with ecology in the framework of a high standard of living and achieve long-term growth in a sustainable economy requires not only restrictions on the bearing capacity of natural resources but also radical changes in their production, industrial implementation and within the very economic systems of the said resource-based economies. Unfortunately, changes in the economy's structure are relatively slow since, according to Ahrend (2006), such economies are based on available resources for a longer period regardless of sectoral development or policy. Their development could be achieved once a diversification of the economy has been carried out, which would, in the long run, increase the level of salaries, expand sectors not intended for export orientation, achieve cheaper import, contribute to the flow of investments, and ultimately enable a better standard of living. However, research has shown that development in such economies often brings multiple problems in practice. Auty's research (1998) highlighted the analyses of Sachs and Warner from 1995, who, while studying market prices and the share of exports and investments in GDP, established the negative effects of the use of resources on the structure of non-export GDP and GDP per capita that determine the levels of economic growth. Although resource industrialisation would promote better growth, the question is whether economic governance would enable a better standard of living, i.e., retain sustainable development in the long run.

Some experts believe that the oil industry is more advantageous for resource-based economies than other non-renewable resources and more important than other activities because of its high productivity rate, the durability of the industry, price volatility, and universal consumption, since oil is used in the form of fuel, inputs in industries, and dominant energy sources mainly in industrial sectors (according to the IMF, amounting to as much as 30%). Some countries are becoming the wealthiest members of the world economy, such as Saudi Arabia, whose market advantage stems from possessing the cheapest oil raw material and huge oil supplies. Since other economic activities have not been developed for a number of reasons, Saudi Arabia chooses to turn to an economy with highly profitable exploitation, production, and export of oil. The Saudi oil sector accounts for about 45% of budgetary revenues, 70% of export revenues, and about 50% of gross domestic product (OPEC, 2022). Many colloquially call it the "Energy Superpower" of the modern age since it alone owns 31% of the OPEC production structure, with a total value of us $34.4 billion (World Atlas, 2022), owns as much as 24% of the worldwide proven reserves, and is the most significant player in terms of total revenues of as much as $136.2 billion, which is best seen in its 20.1% share in the world market, just ahead of Russia (10.9%), Iraq (6.8%), and Canada (5.8%) (Bankar.me, 2017).

Although many macroeconomic indicators, such as oil prices and exports, point to the positive impact of natural resources as determinants on Saudi economic growth, factors such as the unemployment rate, the underdevelopment of industrial sectors, foreign investment, and GDP per capita in the 21st century show that Saudi Arabia suffers from excessive dependence on a single sector whose existing economic growth does not necessarily involve sustainable development.

1.1 Literature review of the concepts of economic growth, sustainable development, and their measurement determinants

Although different at first glance, economic growth and sustainable development are very complex concepts. While Samuelson and Nordhaus (2007) explain economic growth as an expansion of GDP or overall output in a situation where the output limit moves beyond the maximum output, Elkan (1973) assumes that the same growth sets aside economic development as the process of increasing the satisfaction of the needs of natural persons and economic entities, the quantities of available goods, and the spectrum of available choices. In addition, Todaro and Smith (2006) argue that in the modern era, economic development is best presented in the form of changes in the economy, human needs, and state institutions, while reducing inequalities and

poverty, and increasing well-being of the population.

The same concept underlines sustainable development that creates conditions for economic well-being and reduces resource consumption for better long-term production and balanced ecosystem capacity. The concept of sustainability or sustainable development was formed as part of the report "Our Common Future" (known as the Brundtland Commission), according to which it is defined as "development that meets the needs of the present without jeopardising the ability of future generations to meet their own needs" (World Commission for Environment and Development, 1987). Sustainable development is driven by three dimensions, i.e. ecological, economic, and social, from which eponymous systems are singled out (Kaimuri-Kyalo & Kosimbei, 2017). Since it is impossible to analyse them simultaneously, each system is singed out and observed as a separate factor considering the IISD criterion (Bossel, 1999) that "sustainable development is possible only if component systems, as well as the entire system, are sustainable. Despite uncertainty regarding the direction of development, it is necessary to identify components and define indicators that can provide information about the sustainability of each system." Furthermore, due to the failure to use GDP and income as economic development factors, sustainable development indicators are also compiled according to social, economic, and environmental impacts.

New theories of economic growth have postulated that technology leads to knowledge production so that development itself is created from a return to knowledge that has the potential for unlimited development and high investment. Sustainable development can only be ensured through the constant advancement in technology, which is evident today in the rate of GDP growth per capita. Since it is impossible to expect a steady increase in labour factors, and greater capital growth leads to a decrease in return on capital and a drop in economic growth compared to the labour force, a country must continuously improve technology, scientific and research development, and education through economic measures in order to achieve intensive growth (Sarel, 1995).

The role of sustainable development indicators was first considered at the UN Conference on Environment and Development in 1992, which called on countries to develop sustainability indicators to create a basis for decision-making. Phimphanthavong (2014) conducted a study on determinants of sustainable development in the Laos example by regression analysis using GDP variables, income inequality, environmental pollution, etc., to achieve a level of sustainability. The analysis confirmed the thesis about sustainable development as a combination of economic and social development and environmental protection, and it was concluded that the same development could be achieved once inequalities in society are minimised and business operations that condition the protection of natural resources are maintained. Borozan (2006) argues that the aggregate function of production grows in the case of the existence of capital, natural resources, technology, and general social infrastructure, i.e., a set of economic and non-economic determinants affecting the quality of life. The labour force and labour productivity, investments in the form of capital, technology, and human resources are singled out within the set of economic determinants, while the selected non-economic determinants represent institutions, entrepreneurial ventures, and macroeconomic policies.

Labour productivity is closely related to the rate of GDP per capita since long-term growth stems from increased labour productivity, and its quantity is determined by human capital, technological changes, and economies of scale. Although the labour force determines the productivity level, the population is not significant for economic activity because a part does not participate in activities, and excessive growth hinders growth (Miller, 2016). As a more mobile production factor, investments affect annual GDP and aggregate demand function changes. "The most pressing problem for developing countries with economies of scale is too low savings facing low or non-existent investments in the manufacturing sector" (Tilinger, 2015). In a resource-based economy, investments in capital procurement are often not marginalised due to the non-implementation of infrastructure changes, and to increase investments and accelerate growth, they resort to borrowing. If not used transparently, the borrowed funds will cause reduced growth rates, a drop in capital investments, and a slowdown in economic development, which is best seen in countries with high GDP and public debt (Aizenman et al., 2017).

The two indicators most frequently used in the economic dimension of sustainable development

are the Human Development Index (HDI) and the Index of Sustainable Economic Welfare (ISEW). While the HDI is measured in a range from 0 to 1, where 1 denotes the highest level of human development under the items of longevity, knowledge, and resource use measured by adjusting GDP per capita and purchasing power parity, the ISEW considers environmental degradation and is calculated based on the adjustment of the consumption index with the distribution of inequalities and the breakdown of environmental protection measures such as non-renewability of natural resources (Kaimuri-Kyalo & Kosimbei, 2017). International trade affects the distribution of income between countries and its increase conditions a replacement of an export quantity for an import quantity. However, its revenues do not mean that the country's well-being has increased but can show critical changes in the economic system depending on the change in the prices and quantity of exports or imports of outputs or real national income. Currently, some countries use the ratio of adjusted net savings (ANS) to gross national income to quantify development, which may best show genuine economic sustainability. If savings are positive, the theory suggests that prosperity increases since "positive savings enable wealth growth over time, ensuring future generations to enjoy as many opportunities as the current ones" (World Bank, 2012). By contrast, negligible or negative amounts of the rate reduce the wealth and overall prosperity of the country in the long run.

In any case, economic sustainability, which is prolonged by economic growth and sustainable development, is exclusively oriented to consumption and contribution of natural resources in the eponymous economies to production, and is achieved by increasing the well-being of all generations or "the non-declining usefulness of a representative member of society throughout the millennia into the future" (Pezzey, 1992). Bojo et al. (1992) best show that "economic development in a given area is sustainable only if the total stock of resources – human capital, physical population, environmental resources, and exhaustible resources – is not reduced over time."

2. Methodology and the research model

The research problem is examined using the econometric methods of multiple linear regression analysis and the multicollinearity test as part of the correlation analysis. The analysis covers the period from 2010 to 2020. Within the same concept, sustainable development that creates conditions for economic well-being and reduction in resource consumption for the needs of better long-term production and balanced capacity of the ecosystem is particularly highlighted. This paper aims to examine the determinants of long-term economic growth and sustainable development of the Kingdom of Saudi Arabia as a selected single resource economy. Some of the statistical methods used within the analyses are Pearson correlation coefficients, the coefficient of determination R^2, the corrected coefficient of determination, the F-test, and the corresponding T-test. To create a model of economic growth and determinants of sustainable development, all data were collected from annual reports published on the website of the Saudi Central Bank. Linear in all parameters and deviations, the regression model was obtained on a sample of thirteen (13) independent variables in the appropriate form:

$$\text{Real GDP growth rate (Y)} = \beta_0 + \beta_{1\text{inflation}} + \beta_{2\text{budget surplus/deficit}} + \beta_{3\text{oil exports}} + \beta_{4\text{imports}} + \beta_{5\text{unemployment}} + \beta_{6\text{foreign direct investment (FDI)}} + \beta_{7\text{labour productivity}} + \beta_{8\text{public debt}} + \beta_{9\text{labour force}} + \beta_{10\text{BDP per capita}} + \beta_{11\text{HDI index}} + \beta_{12\text{total natural resources rent}} + \beta_{13\text{ adjusted net savings}}$$

The dependent variable is the annual rate of the real gross domestic product as a measure of the total economic activity of Saudi Arabia, while the factors used as independent variables in the analysis are inflation, budgetary surplus (deficit), total oil exports, import, unemployment rate, foreign direct investments, labour productivity, public debt, labour force, GDP per capita, the HDI index, total natural resources rents, and adjusted net savings (ANS). The indicators are correlated with the dependent variable based on which the function of the ten-year model and the contribution of determinants to economic growth and sustainable development are assessed. Depending on the chosen set and the results of the conducted tests, two hypotheses were set. While the null hypothesis, H_0, concludes based on the high coefficients that there is no statistically significant correlation between the analysed set, the alternative hypothesis, H_1, shows a statistically significant correlation between the same variables

since its coefficients are lower than the maximum value.

In addition to these factors, the model attempted to analyse additional variables determined by the theory as crucial factors for economic growth. Unfortunately, the limitations refer to a statistical set excluded from testing due to regression that does not take into account short-term economic growth indicators or factors of insignificant value for the observed years.

2.1 Research results

Table 1 Correlation matrix of GDP and determinants of economic growth

	GDP (%)	Inflation	Budget deficit	Oil exports	Import	Unemployment rate	ISU	Labour productivity	Public debt	Labour force
GDP (%)	1									
Inflation	0.43	1								
Budget deficit	0.74	0.41	1							
Oil exports	0.77	0.34	0.91	1						
Import	0.10	-0.03	-0.08	0.24	1					
Unemployment rate	-0.71	0.12	-0.41	-0.46	-0.14	1				
ISU	-0.50	-0.55	-0.51	-0.28	0.27	0.22	1			
Labour productivity	0.73	0.31	0.89	0.98	0.24	-0.37	-0.23	1		
Public debt	-0.74	-0.62	-0.50	-0.57	-0.34	0.49	0.62	-0.47	1	
Labour force	-0.81	-0.59	-0.79	-0.64	0.23	0.48	0.87	-0.58	0.74	1

Source: Authors' calculation

Table 1 shows the correlation between the dependent variable and the set of independent variables that represent determinants of long-term economic growth. The test has shown that there is a very strong and positive correlation between GDP and the variables of the budget deficit/surplus (74%), oil exports (77%), and labour productivity (73%). Inflation and import have a low and positive correlation with the dependent variable (43% and 10% of the correlation with GDP, respectively). In contrast to expectations, there is a very high but negative correlation between GDP and the unemployment rate (-71%), foreign direct investment (-50%), and public debt (-74%).

Despite the high correlation with labour productivity, it is evident from the data that the most significant negative correlation is the one between GDP and the labour force factor (-81%), which suggests that labour productivity does not necessarily stem from the number of skilled labour force in Saudi Arabia. Namely, the Saudi economy relies on oil, whose exports generate a GDP rate and have the greatest impact on aggregate money supply and foreign currency inflows, records an increase in surplus on the budget (visible in the correlation of 91% with oil exports) and realises high labour productivity (a correlation of 98%). Although the local population is massively employed in the agricultural and service sectors, the oil sector has been driven by productivity-generating migrants.

Table 2 Summary of regression statistics and ANOVA table

Regression Statistics					
Multiple R				0.9999	
R Square				0.9997	
Adjusted R Square				0.9974	
Standard Error				0.1731	
Observations				11.0000	
	DF	SS	MS	F	Significance F
Regression	9	116.126391	12.902932	**430.4959362**	**0.037**
Residual	1	0.02997225	0.0299723		
Total	10	116.156364			

Source: Authors' calculation

The F-statistic in Table 2 is as high as 430.49, the p-value is 0.037, which is lower than the alpha value (α = 0.05), and it indicates that the regression model is entirely statistically significant, i.e., the hypothesis that there is no linear correlation has been rejected. Since there is a high correlation between GDP and these variables (99%), the multiple correlation confirms that the results in the annual GDP rate trends can be accurately predicted using a set of tested variables. The determination coefficient suggests that about 99% of real GDP variations are explained by means of explanatory variables of the model.

Table 3 Multiple regression model of economic growth in Saudi Arabia (2010-2021)

	Coefficients	**Standard Error**	**t Stat**	**P-value**
Intercept	9.68	5.56	1.74	0.33
Inflation	-0.56	0.09	-6.54	**0.10**
Budget deficit	0.02	0.00	10.35	0.06
Oil exports	-0.06	0.00	-18.27	0.03
Import	0.01	0.00	3.35	**0.18**
Unemployment rate	-0.61	0.36	-1.69	**0.34**
ISU	0.14	0.01	13.45	0.05
Labour productivity	0.54	0.03	17.71	0.04
Public debt	-0.01	0.00	-12.01	0.05
Labour force	**-4.74**	0.48	-9.92	**0.06**

Source: Authors' calculation

The regression analysis (Table 3) established the following results: the inflation, unemployment, labour productivity, and public debt variables, and the associated coefficients coincide with theoretically expected values. In the observed period, Saudi Arabia recorded mild inflation ranging between 2 and 4%, with the exception of the pandemic years when it reached the level of negative -2% and posi-

tive 3%, respectively. Considering the imbalance in the energy products market, their prices, and the "closure" of all global economies due to the emergence of the COVID-19 virus, additional central bank's money emission increased the inflation rate and the poverty rate. Such "cost inflation", caused by a VAT increase, has only registered the highest price increase of the consumer price index components in the past three years and a reduction in GDP rates, i.e., a negative impact of 56% on Saudi GDP.

The agricultural sector contributed on average less than 20% to the employment rate of the total employment level for many years until the end of 2014. A vast number of the younger and the domestic population constitute structural unemployment depending on the lack of knowledge, skills, and competencies required in the markets as well as the percentage of employment in the service sector. In accordance with the situation, the regression has established a negative impact of 61% on GDP.

Furthermore, labour productivity recorded a positive impact of 54% on economic growth considering that foreign nationals as residents of the country fill the workforce in active sectors such as the oil sector. Although successfully reduced in previous years due to a high surplus in the budget and on the current account balance sheet, public debt increased by 118 billion SAR in the pandemic years, thus reducing economic growth to -4.1%. Such debt, the cause of which was not found in private capital accumulation but in state debt and the "support" measures, forced the government to sell state bonds and consequently reduced the level of salaries and production. The monetisation of debt by "printing" money and increasing lending to educational and health projects increased the debt by 25.9%, thus predicting a negative impact of 1% on the real GDP rate.

Government decisions on economy diversification under the "Vision 2030" programme launched in 2016 and the emergence of the COVID-19 virus caused a double decrease in real GDP and a 10.8% drop in the volume of oil exports. The drastic drop in oil prices by around 25% in global markets has further complicated the situation, as co-world prices and production volumes have sharply dropped due to the health and economic crisis.

Although there is permanent resource scarcity and the underdevelopment of many economic sectors in the country, the import rate is constantly linked to the rate of oil revenues since the country retains part of the imported goods for consumption in its own industries. The recession caused by the pandemic caused a reduction in both total exports and imports, primarily in the private sector, mainly through the decline in financing from commercial banks. Furthermore, resources are represented in the import structure, which in the short term generate growth of private consumption in the structure of real GDP, and therefore, the analysis showed a weak and positive impact of 1% on the GDP rate.

Since the country reflects a negative list of sectors banning foreign investment without state control, with the subsequent halt of state investment in reform projects during the COVID-19 crisis, it is evident that regression has found a positive but very low impact of 14% on GDP, with a high p-value bordering the recommended end level. Unfortunately, the labour force variable has the largest and negative coefficient. The global health crisis has raised the overall level of unemployment, which is evident in the growth of the Saudi rate to more than 7%. For the reasons already explained (low employment of the resident population, underdevelopment of the education system, poor structure of the overall labour force, etc.), it is evident that the labour force has a negative impact of as much as 4.74% on gross domestic product.

The long-term significance test, measured by the t-statistic, shows that all explanatory variables are statistically significant depending on p-values that are lower than alpha values (0.05). In the short term, taking into account the expansion of the energy market and the impact of the COVID-19 crisis, the exceptions are the variables of inflation, import, unemployment, and labour force, which are statistically insignificant because their p-values exceed by far the alpha value. The coefficients of independent variables are in line with previous expectations: the budget deficit is significant at 6%, oil exports at 3%, labour productivity at 4%, and ISU and public debt at the maximum level of 5%.

Table 4 Correlation matrix between GDP and determinants of sustainable development

	GDP (%)	GDP per capita	HDI index	Total natural resources rents	Adjusted net savings
GDP (%)	1				
GDP per capita	0.46	1			
HDI index	**-0.59**	**0.05**	1		
Total natural resources rents	0.68	0.65	-0.65	1	
Adjusted net savings	0.45	0.40	**-0.75**	0.82	1

Source: Authors' calculation

The correlation matrix in Table 4 analyses the ratio between the GDP rate and the set of variables of economic dimensions that are considered determinants of sustainable development. The test showed a high and positive correlation between GDP and GDP parameters per capita (46%), the total natural resources rents (68%), and adjusted net savings (45%). Unfortunately, there is a high negative correlation with the HDI index (-59%). Unexpected results were found in the correlations between the HDI index and individual variables, a particularly low and positive link to GDP per capita (5%), but a very strong and negative correlation with adjusted net savings (-75%).

Table 5 Regression table and ANOVA table

Regression statistics					
Multiple R	**0.8717**				
R Square	**0.7599**				
Adjusted R Square	0.5999				
Standard Error	2.1558				
Observations	11				
	Df	SS	MS	F	Significance F
Regression	4	88.27222107	22.0680553	**4.748517238**	**0.0454**
Residual	6	27.88414256	4.64735709		
Total	10	116.1563636			

Source: Authors' calculation

F-statistics in Table 5 amount to 4.74, the p-value is 0.045, which is still less than the alpha value and indicates that the model of sustainable development is statistically significant, i.e., the hypothesis that there is no connection is rejected. Based on the correlation between GDP and these variables, a multiple correlation of 87% confirms that results in trends in the annual GDP rate can be predicted using a set of selected variables. The coefficient of determination suggests that about 76% of variations are explained using explanatory variables of the regression model.

Table 6 Multiple regression model of sustainable development of Saudi Arabia (2010-2021)

	Coefficients	Standard Error	t Stat	P-value
Intercept	210.99	84.96	2.48	0.05
GDP per capita	**0.00**	0.00	1.93	0.10
HDI index	**-275.09**	108.89	-2.53	**0.04**
Total natural resources rents	**-0.03**	0.18	-0.16	0.88
Adjusted net savings	**-0.39**	0.19	-2.00	0.09

Source: Authors' calculation

Just like the case of economic growth determinants (Table 6), the existing theory determines in advance the relationship and coefficients of all sustainable development factors. In this case, it is assumed that GDP per capita, the HDI index, the total natural resources rents, and adjusted net savings (ANS) positively influence the level of sustainable development of a resource-based economy, so that positive signs in coefficients are expected. The regression analysis established the results contradictory to expectations, i.e., all indicators had a negative impact on the GDP rate, with the exception of the GDP per capita variable, which shows no impact on the dependent variable (0%).

The HDI index ranging from 0.809 to 0.859, with a three-year stagnation at the level of 0.854, indicated a decrease in the level of human development in accordance with the growth in longevity and the number of the younger population, but with chronic lack of skills. Despite the oil revenues, the country has not achieved prosperity for the entire population, but it has facilitated economic changes on the basis of real national income, prices, a drop in exports, and an increase in oil scarcity. Only within the last recession, unequal distribution of education, health, and the standard of living has stopped progress in the country, losing up to 24% of the HDI index and thus suffering the worst impact on GDP of -275.09%.

2.2 Discussion

The economic consequences have forced the country to take more restrictive austerity measures that have hindered the reforms from the "Vision 2030" programme. Although adjusted net savings recorded positive figures in the observed period, their gradual decline and a decline in gross national income show that Saudi Arabia does not make enough wealth for future generations. In general, household income declines during recessions; however, the support measures implemented in 2019/20 by the national government mitigated a decline in the income, increasing at the same time household savings to 23 billion SAR, with constraints affecting private consumption. For this reason, it is evident that ANS has a negative impact on GDP of 39%.

In addition to the OPEC's refusal to reduce production and lower oil prices, the country increased its oil supplies to prevent long-term consequences. Unfortunately, the oil use rent was so high in the year before the outbreak of the virus and at the peak of the oil market in 2014 that the substitution of raw materials affected the decisions of the population to temporarily use other sources of energy. Since the rent was above the balance point on the market, some of the oil remained unused in recent years given a drop in demand and, ultimately, the regression established a negative impact of the natural resources rent of 3% on GDP. Since the long-term significance test has established statistical insignificance of all variables depending on p-values exceeding the maximum level with the exception of the HDI index with a coefficient of 0.04, the coefficients of variables are in line with previous expectations, i.e., GDP per capita, the total resource rent, and net savings are insignificant at the levels of 10%, 88%, and 9%, respectively.

3. Conclusion

The aim of the research was to analyse the determinants of long-term economic growth and sustainable development of Saudi Arabia using the econometric methods of multiple regression analysis and the multicollinearity test for the period from 2010 to 2020. The research was conducted based on a model of 13 variables, with the dependent variable

constituting the annual GDP rate, while independent variables included inflation, budget deficit, oil exports, import, the unemployment rate, foreign direct investment, labour productivity, public debt, labour force, GDP per capita, the HDI index, total natural resources rents, and adjusted net savings.

The results point to a very strong positive correlation between GDP and determinants of the budget deficit, oil exports, and labour productivity. Inflation and import have a low and positive correlation with GDP, and a negative correlation with the rate of unemployment, foreign investment, and public debt. Despite the correlation with labour productivity, it was found that the greatest negative correlation is the one between GDP and labour force because labour productivity does not stem from the number of the skilled people but from productivity in the oil sector. The p-value of 0.037 determined the statistical significance of regression analysis and a high correlation between GDP and economic growth determinants of 99%. The theory assumes that a budget surplus, foreign investments, exports, labour productivity, and labour force positively stimulate economic growth, while unemployment, inflation, budget deficit, import, and public debt have a negative impact on the economy. The research has shown that inflation, unemployment, labour productivity, and public debt exclusively coincide with theoretical expectations. The t-test has shown that all explained variables are statistically significant due to lower p-values, so that the coefficients are also in line with the expectations: budget deficit of 6%, oil exports at 3%, labour productivity at 4%, and ISU and public debt at the maximum level of 5%. In the short term, considering the expansion of the energy market and the impact of the COVID-19 crisis, the exceptions are inflation, import, unemployment, and labour force due to statistical insignificance.

On the other hand, the research established a high and positive correlation between GDP and a set of determinants of sustainable development: GDP per capita (46%), the natural resources rent (68%), and adjusted net savings (45%). A negative correlation is achieved with the HDI index (-59%). The p-value in the F-test is 0.045, and it shows the statistical significance of the sustainable development model. The theory assumes that GDP per capita, the HDI index, resource rent, and adjusted net savings positively affect Saudi Arabia's sustainable development rate; however, the research found the opposite results, i.e., indicators have a negative impact on GDP, with the exception of GDP per capita that shows no impact on the dependent variable (0%). The t-test determined the statistical insignificance of all variables depending on p-values exceeding the maximum level, with the exception of the HDI index, so that coefficients are also in line with expectations: GDP per capita is insignificant for GDP, total natural resources rents, and net savings at the levels of 10%, 88%, and 9% or more, respectively. The limitations of the research presented in this paper are related to the statistical set that was excluded from testing, given that the regression analysis does not take into account indicators of short-term growth of the economy, as well as factors with insignificant values for the observed years. Based on these results, the results suggest that investing in human capital is an urgent step to achieve long-term sustainability and reduce reliance on operating with natural resources in the future.

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CAPITAL MARKET EFFICIENCY IN TRANSITIONING SOUTHEASTERN EUROPEAN COUNTRIES

Abstract

Purpose: This paper is a continuation of research in the series that examines the weak form of the efficient capital markets theorem in Southeast European transitioning economies. Model modifications are based on learnings through the previously established inapplicability of foreign exchange metrics. At the same time, the model is being expanded by incorporating new research markets, extending the time coverage to the longest duration to date, between 2005 and 2021, to cover economic bust and recovery periods and research inherent improvements in the capital market context, and adding new variables to provide more sturdiness and conclusiveness.

Methodology: The paper applies the panel pooled mean group estimator by aggregating cross-country data. By using level series prime data instead of differentials, this method enables efficient use of information and resolves at best the identified market shallowness.

Results: The statistical results of empirical research infer the inefficiency of the investigated markets with greater robustness and supplementary new information revealing more powerful corrective investor and policy behavior in collectively more mature markets.

Conclusions: The findings firmly reiterate subpar capital markets performance in a prolonged and more comprehensive environment. The recommendations conclusively emphasize the importance of structural reforms to support sustainability through elementary setup drivers, such as transparency, governance, judiciary productivity, and policy support, *inter alia*.

Keywords: Economy, capital markets, frontier and emerging markets, Southeast Europe, market efficiency

1. Introduction

The capital markets in Southeast Europe emerged in the early 1990s. As with other nascent markets, they showed frequent failures in the initial period. In the transitioning process from planned to free-market economies, the establishment of public stocks exchanges was set as a priority to serve as a means for privatizing assets previously owned by the state. Therefore, the development of the market in favor of the improvement of wider access, increased transparency and corporate governance, and the wider context through improving the complementary institutional, legislative, and tribunal environment was curtailed. With the passage of time, despite maturing, there is still data scarcity, and ceteris paribus, it deters irrefutable empirical confirmation of the relationship between macroeconomic indicators and the performance of stock exchanges. Such a condition has led to methodological inconsistencies and dissuaded vast empirical research. In the contemporary and more standardized performance and through proven and yet strengthened statistical methodologies, this research attempts to clarify frequently identified obscurity coming from fads in the relationship between indicators. It demonstrates with empirical evidence the existence and direction of meaningful relationships.

The underlying assumption for the efficient capital market theorem is that of prices always reflecting public information in an environment of full transparency and rational behavior. In this study, the weak form of the capital market efficiency theorem is examined by monitoring the impact of macroeconomic indicators on stock exchanges indexes over time and across countries. In a perfectly efficient market, no relevance of the relationship should be identified due to the market's a-priori absorption of public macroeconomic information, in action and expectation. Alternative theoretical forms of market efficiency are the semi-strong/event form, where prices are imminently adjusted to contemporary public information, and the strong/private form, where insider information is also contained in prices. Southeast European capital markets are universally shallow in daily secondary trading and provide for only sporadic corporate capital market actions. Therefore, the efficiency of the event form is not studied due to the lack of market-relevant data, and the efficiency of the private form is not considered either due to the well-known existence of transaction costs that would otherwise not be present in a perfectly efficient market. In Southeast Europe, the listed stock prices are generally not representative of the actual prices of market transactions. Market uncertainty is widespread amongst investors, and the representation of retail, portfolio, and foreign investors is often marginal. Most large local issuers often deliberately seek alternatives, and frequently so by using Western European capital markets in search of greater liquidity and business security.

This paper is organized in four sections as follows: The first section introduces the background environment and the economic thought behind the research question. The second section presents a review of the literature behind the study. The third section reveals the empirical assessment methodological approach and the results of empirical statistical testing with implicit interpretations. The final section concludes with findings and recommendations.

2. Literature review

Despite vast research to date, for emerging markets, let alone frontier markets, there is little consensus on uniform results for capital markets efficiency as measured by the impact of macroeconomic indicators on stock indexes. Consideration of research in the direction of the reverse relationship is hindered by commonalities in known scarce capital markets that form a constituent value, e.g. by capitalization or turnover, to national economic outputs, and which further calls into question the statistical relevance due to the greater possibility of endogeneity.

Table 1 Some empirical studies of capital market efficiency

Authors	Markets	Period	Method/Model	Main results
Azar, 2010	USA	January 1947 - March 2009	ARMA and GARCH models	An established negative impact of the key borrowing interest rate and of inflation on stock exchange market indexes.
Barakat et al., 2016	Egypt and Tunisia	January 1998 - January 2014	Granger causality	Statistically significant bivariate causality between macroeconomic indicators and listed stock markets.
Barbić & Čondić-Jurkić, 2011	Croatia, Czech Republic, Hungary, Poland, and Slovenia	January 1998 - January 2010	Johansen cointegration method and Granger causality test	Statistically significant bivariate association between macroeconomic indicators and listed stock prices.
Campbell & Vuolteenaho, 2004	USA	June 1927 - December 2002	VAR model	A negative impact of the key borrowing interest rate and inflation on stock exchange market indexes.
Dodig, 2020	Slovenia, Croatia, Serbia, B&H, and North Macedonia	September 2005 - December 2016	Panel PMG model	Market inefficiency testing through the existence of an established short- and long-term relationship and the impact of macroeconomic indicators on a set of indexes of transitioning countries, jointly and independently.
Dumas et al., 2003	Austria, Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Spain, Sweden, the UK, and the USA	January 1970 - June 1996	Single-index statistical model	A positive impact of macroeconomic performance on financial market performance.
Fink et al., 2006	Bulgaria, Czech Republic, Slovakia, Hungary, Slovenia, Poland, Romania, Malta, and Turkey	1996 - 2000	Panel regression model and cross-section regression model	Growth in listed stock prices positively impacts the aggregate economic output measured by GDP.
Jamaludin et al., 2017	Singapore, Malaysia, and Indonesia	January 2005 - December 2015	Panel least square regression	Statistically significant co-integration between macroeconomic indicators and stock markets.
Pilinkus, 2010	Lithuania, Latvia, and Estonia	January 2000 - December 2008	Granger causality tests, Johansen cointegration method and VAR model	A positive association between an increase in money supply and listed stock prices.
Plíhal, 2016	Germany	January 1999 - September 2015	Johansen cointegration method, Granger causality test VAR model	A statistically significant relationship between the stock market index and industrial production, and between the stock market index and key interest rates.

Source: Authors

Most stock exchange index movements remain mysterious as only a minority is tied to fundamental economic information and more cohesive clustering is evident with findings that regional contagions are more abundant than global ones (Cornell, 2013; Gkillas et al., 2019; Patatoukas, 2021). Diverse empirical research results differ with regard to the existence and direction of the relationship between macroeconomic performance and the performance of financial markets. In the existent relationships, the positive impact mostly prevails for developed markets (Fama, 1981; Chen et al., 1986; Dumas et al., 2003), but there are bubbles and trends in the relationship (Binswanger, 1999; Domian & Louton, 1997; Issahaku et al., 2013; Ehrmann & Fratzscher, 2004). The findings show that stock indexes are more closely correlated with macroeconomic indicators in poorer economies. Typically, such an association is a result of a relatively larger public sector and the value of system- versus firm-specific components in performance (Morck et al., 2000). Likewise, frontier and emerging markets more often have co-integration between macroeconomic indicators and stock markets, yet without a clear indication of associating the direction of the relationship or causality (Barakat et al., 2016; Jamaludin et al., 2017). Context inadequacies in transition economies are often highlighted as a soft constraint that hinders capital market efficiency (Naceur et al., 2007; Koivu, 2002; Fink et al., 2006; Cojocaru et al., 2016). Forms of such deficiencies may appear, e.g., in public uncertainty about the quality of the institutional, regulatory or tribunal environment.

Apart from the previous own empirical research with the already identified limitations of still shallow markets and the necessity of expanding the temporal and geographic area, and identifying the factors of the set of variables, to date there has been no coherent and extensive research on the efficiency of capital markets in Southeast Europe (Dodig, 2020). Identified peripheral comparators include proven existence in the nexus of capital market development, using capitalization and turnover to aggregate economic output growth (Fink et al., 2006; Lazarov et al., 2016; Olgić Draženović & Kusanović, 2016). Further, through Granger causality, Barbić & Čondić-Jurkić (2011) identified a bivariate relationship of the impact of macroeconomic indicators on prices in capital markets in single-country studies in Croatia and Slovenia (Barbić & Čondić-Jurkić, 2011). Nicolescu's research from 2003 to 2019 using annual data points and single-country analysis shows a significant association of inflation and GDP per capita with inherent stock indexes in Romania and Hungary (Nicolescu, 2020). Multivariate research presented here covers approximated two full economic cycle periods, a panel review of more mature transitioning markets, and the improvements sought through a strengthened model with additional determining aspects. It seeks further to factually attest to a more trusting relationship between macroeconomic and capital market indicators in a longer time review, as is often recommended (Fama, 1990; Binswanger, 1999; Onofrei et al., 2019).

From a global overview, the impact of macroeconomic indicators on the listed stock prices points to sporadic capital market inefficiencies in the short run, and less so in the long run (Megaravalli & Sampagnaro, 2018; Lee & Wang, 2015; Pilinkus, 2010; Plíhal, 2016). Likewise, Onofrei et al. (2019) showed that the intensity of co-movement of frontier and emerging market stock indexes with developed market stock indexes is co-integrated with inflation, the foreign exchange rate, and the production rate. In particular, capital markets seem to be more reactive to a wider set of factors in periods of crisis and interestingly, there are implications that in post-crisis periods, macro-driven markets prevail in recovery (Celebi & Hönig, 2019). Other results suggest that good public governance is an important determinant of portfolio investments flows (Chipalkatti et al., 2007). The researchers identified a relationship with the foreign exchange factor and acknowledged a negative coefficient of contribution by increasing the key borrowing interest rate and by inflation on stock exchange market indexes (Azar, 2010; Balduzzi, 1995; Campbell & Vuolteenaho, 2004). In our previous research, the exchange rate indicator denominated in US dollars (USD) was found to be insignificant, as expected, due to the dependence of the underlying economic markets on the euro, a peg to or direct use of the euro, and the non-prevalence of USD investors. It is also noticeable that there have been no significant movements in the selected local currencies in relation to the euro exchange rate, there are frequent managed floats, and in addition, Croatia is expected to introduce the euro on 1 January 2023. For that reason, the FX factor was dropped in this research. By contrast, our previous research confirmed a long-run negative impact of the key rate and inflation and ul-

timately confirmed a statistically relevant relationship with the indicator of the net financial account of the balance of payments. This research progresses to decompose that indicator to sub-component relationships in search of association drivers and explanations of the direction of relationships.

3. Empirical approach and results

The research sample consists of 378 data records from six Southeast European countries (Croatia, Slovenia, Bosnia and Herzegovina, Serbia, North Macedonia, and Montenegro) in the period from 2005 to 2021. Descriptive statistics are shown in the appendix. This research discusses markets that have similarly transitioned from central planning to a free market economy; however, individual markets today differ in the level of economic development, capital market development, and the surrounding institutional, regulatory, legislative, and tribunal environment, *inter alia multa*. The selected panel PMG method best addresses the characteristics of research data by using the primary data format and fixing long-run coefficients for more reliable results, but allowing for intercept variance and error variance on an individual country basis, which then provides an insight into short-run and individual country results sensitivity. The dynamic technique resolves the inconsistencies of static models, better addresses unobserved error bias, and tolerates data heterogeneity more effectively. It is a suitably poised method for the selected dataset by capturing in fixed coefficients the common cross-countries traits and at the same time in the variability of the error variance according to the specificities of individual countries. Finally, panel PMG effectively treats both stationary and non-stationary data and allows the use of nominal data values relative to the requirement for data differentiation and information loss.

Exploratory empirical analysis starts by using the Augmented Dickey Fuller (ADF) test to confirm the presence of unit roots in the data standard level and differences level series (Dickey & Fuller, 1979). In that way, non-stationarity is diagnosed as a precondition for integration. ADF results determine the stationary form only in other differentially smoothed data. Data information is lost in transformations through differentiation. Therefore, we believe that the ability of the panel PMG statistical method to simultaneously treat stationary and non-stationary parameters is an advantage compared to the bivariate Granger and Johansen methods, which can only treat stationary and non-stationary parameters. The cointegration analysis is set up in an environment where the time series variables exhibit drift but still do not diverge to a large extent to disturb the long-run equilibrium. In other words, although a short-run deviation in the cointegrating movement of two variables may be observed, the two variables exhibit a cointegrating equilibrium in the long run (Engle & Granger, 1987). In this research, we use the Johansen cointegration method to analyze such behavior (Johansen, 1991). The main reason why we used the Johansen cointegration method instead of the Engel and Granger two-step method is that the Johansen test has the ability to identify more than one cointegrating factor in a bivariate relationship, as shown in Table 4 in the appendix. Therefore, the Johansen methodology dominates the Engle and Granger methodology in cointegration analyses (Bilgili, 1998). In order to test the causality of the short-term transmission shock in the bivariate relationship, this research employs the Granger method. However, Granger testing may actually be spurious in the significance of results for series that contain a trend and are otherwise random. Thus, the Granger test implies that one occurs before the other without explicit theoretical support for the relationship. For this reason, panel PMG is further utilized to determine a meaningful impact and association in variable relationships.

This research focuses on learnings from utilization of the following panel PMG model:

$$\begin{aligned} SMI_{i,t} = \mu + \lambda_i SMI_{i,t-n} + \beta_1 GDPPC_{i,t} + \beta_2 MMIR_{i,t} \\ + \beta_3 HICP_{i,t} + \beta_4 IPI_{i,t} + \beta_5 FDI_{i,t} + \\ + \beta_6 PI_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (1)$$

In (1) above, β is a long-run parameter coefficient, λ is a scalar value vector, i represents countries, t refers to time, μ refers to the constant value, n represents time periods, and ε refers to error disturbances. The selected macroeconomic indicators include gross domestic product per capita (GDPPC) in the nominal value in euros, inflation (HICP) in the index value, the levels of the industrial production index (IPI) in the index value, the money market interest rate (MMIR) in the absolute value, foreign direct investments (FDI) in the nominal value in euros, and portfolio investments (PI) in the

nominal value in euros. The proxy for the regulated exchange traded markets in Bosnia and Herzegovina (B&H), Serbia, North Macedonia, Montenegro, Croatia, and Slovenia are the equity indexes BATX, BELEX15, MBI10, MONEX, CROBEX10, and SBITOP, respectively.

The statistical testing results for the panel PMG method reveal that the error correction term (ECT) coefficient is negative and statistically significant at the 99% confidence level interval. That result suggests the existence of a stable relationship between macroeconomic indicators and stock indexes in Southeast Europe and therefore provides factual empirical confirmation of market weak form inefficiency. Compared to previous research, the results confirm the existence of the relationship and further reveal a better market correction of 19.7% (versus 8.8%) per annual quarter adjustment to the long-run equilibrium of the relationship. The error correction mechanism may be exhibited in the form of investor sentiment, policy, regulatory, or other response. Examples of stronger ECT in the short and the long run manifest anomalies and likely structural deficiencies underlying irrational behavior. Considering the implications of specific temporal results and the significance of independent variables, it can be noticed that the only long-term statistically significant factor is the MMIR, which is in line with our own previous findings (with proven significant HICP, MMIR, and BOPNFA associations) and reaffirms again the likelihood of improving market efficiency due to a smaller number of identified long-run associations between macroeconomic indicators and stock indexes. Portfolio market theory asserts that a contractionary monetary policy triggers a shift in portfolio preferences from equity to fixed income assets. The implications of the direction of the relationship with the MMIR are consistent with common findings that broadly higher returns are linked with an expansionary monetary policy (Conover et al., 1999; Ehrmann & Fratzscher, 2004). That is primarily the case in more developed markets as fads are more frequent in frontier and emerging markets. For example, Pilinkus (2010) showed in his study a positive money supply association with stock indexes in the case of Estonia in the period from 2000 to 2008.

Table 2 Panel PMG test results – Score of the group of SEE countries

Variable	Coefficient	
	Long run	**Short run**
GDPPC	0.0084 (0.0544)	0.0655 (0.1788)
MMIR	-4157.6770* (1998.4470)	4448.1040 (7271.9760)
HICP	-4.7404 (5.8261)	-40.4004 (48.3224)
IPI	-9.3940 (4.9933)	3.9179* (1.7804)
FDI	-0.0017 (0.0758)	0.1484 (0.2651)
PI	0.0003 (0.0384)	-0.1287* (0.0651)
ECT***	-0.1970** (0.0477)	
Constant		901.3524*
Log likelihood	-2181.048	
Hausman test	3.81[0.2826]	

Note: [] is the p-value. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$.
*** Error correction term, coefficient, and standard error.
Source: Authors

What is specific to the results of this study is the existence of short-run relationships (compared to none in previous research) through the association relationship in that the growth in the IPI value has a positive association with the value of stock indexes and that the growth in the PI value has a negative association with the value of stock indexes. It is apparent that in the markets where the IPI is more represented in stock indexes, there have been greater volatilities in the performance of the IPI together with the bankruptcies of the key players. In addition, the results of the Johansen test (as shown in the appendix) confirm the significance of the IPI cointegrating relationship in the case of Croatia, B&H, and of Montenegro. Importantly, there are more short-term associating relationships, but none in the long run, which again indicates a possible improvement in market efficiency by means of corrective measures. The short-term existence of the relationship with PI is in line with the previously confirmed relationship with the broader net financial account of the balance of payments. Similarly, the direction of the relationship cannot be analyzed in detail without prior awareness of the constituents of tradable PI securities, either in product form (e.g. equities, fixed-income securities, derivatives) or duration (short- versus long-form). Similarly again, the absence of a long-term relationship for the same indicators may allude to market correction activity.

Table 3 PMG test results – Score of individual SEE countries

Country	Croatia	Slovenia	B&H	Serbia	North Macedonia	Montenegro
Long run						
GDPPC	0.0084 (0.0544)	0.0084 (0.0544)	0.0084 (0.0544)	0.0084 (0.0544)	0.0084 (0.0544)	0.0084 (0.0544)
MMIR	-4157.677* (1998.447)	-4157.677* (1998.447)	-4157.677* (1998.447)	-4157.677* (1998.447)	-4157.677* (1998.447)	-4157.677* (1998.447)
HICP	-4.7404 (5.8261)	-4.7404 (5.8261)	-4.7404 (5.8261)	-4.7404 (5.8261)	-4.7404 (5.8261)	-4.7404 (5.8261)
IPI	-9.3940 (4.9933)	-9.3940 (4.9933)	-9.3940 (4.9933)	-9.3940 (4.9933)	-9.3940 (4.9933)	-9.3940 (4.9933)
FDI	-0.0017 (0.0758)	-0.0017 (0.0758)	-0.0017 (0.0758)	-0.0017 (0.0758)	-0.0017 (0.0758)	-0.0017 (0.0758)
PI	0.0003 (0.0384)	0.0003 (0.0384)	0.0003 (0.0384)	0.0003 (0.0384)	0.0003 (0.0384)	0.0003 (0.0384)
ECT***	-0.1246* (0.0512)	-0.1122* (0.0494)	-0.2757* (0.1045)	-0.3643** (0.0698)	-0.0583 (0.0546)	-0.2468** (0.0688)
Short run						
GDPPC	- 0.0812 (0.2190)	0.0629 (0.1036)	0.0137 (0.1204)	0.0122 (0.1343)	-0.4779 (2.0480)	0.8632 (0.6509)
MMIR	8,448.0210 (5,042.800)	5,753.148 (6,659.123)	1160.0920 (4,778.463)	2099.9370 (1,718.697)	-23246.3600 (13,947.010)	32473.7800 (71,799.700)
HICP	45.9918 (54.1574)	34.7039 (24.5699)	9.7383 (8.5602)	14.1739 (15.6382)	-84.0029 (94.6866)	-263.0075* (112.5595)
IPI	4.1090 (7.0877)	-0.9916 (4.5900)	-0.2043 (1.4788)	2.6402 (1.8070)	8.2210 (8.0558)	9.7330 (6.4738)
FDI	-0.2858 (0.1065)*	0.0323 (0.0699)	0.0093 (0.0970)	-0.0686 (0.0457)	-0.2437 (1.2349)	1.4469 (1.1158)
PI	-0.0396 (0.0443)	0.0120 (0.0145)	-0.2001 (0.1390)	-0.0033 (0.0257)	-0.1323 (0.4513)	-0.4091 (0.7295)
Constant	438.8869* (218.7026)	225.6820 (149.8622)	578.0567 (310.1763)	834.2894* (346.5510)	310.8344 (269.8491)	3020.3650** (881.7832)
Log likelihood	-2181.048					
Hausman test	3.81[0.2826]					

Note: [] is the p-value. Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$.
*** Error correction term, coefficient, and standard error
Source: Authors

The individual countries results imply a significant ECT coefficient for all of the markets except for North Macedonia, which is contradicts previous findings. In addition, there are new significant coefficients for B&H and Serbia. A greater number of significant ECTs may allude to more advanced market correction capacity. Of the significant short-term relationships between individual countries, the only relevant one is the negative connection of HICP in the case of Montenegro (compared to seven significant relationships identified in our own previous research). The identified negative impact of inflation is consistent with the dominant previous thematic findings (Azar, 2010; Balduzzi, 1995; Campbell & Vuolteenaho, 2004; Conover et al., 1999; Ehrmann & Fratzscher, 2004).

4. Conclusions and recommendations

The results of empirical research factually support evidence of market inefficiency with regard to Eugene Fama's weak form theorem. A comparison with earlier findings shows that the two are much in line, but it is also clear that with extended time and better adjusted model variables, the results show faster market adjustment and lesser sensitivity to macro factors. New findings reveal the existence of the impact of portfolio investments. Furthermore, the inclusion of Montenegro gives findings relatively comparable to other regional markets. Finally, the extended time coverage confirms the reliability of the data through another period of boom and bust in relation to the spillover of Covid-19 and the onset of the economic crisis from 2020 onwards. From a policy perspective, in addition to the empirically established weak form of capital inefficiency, it is important to remain aware of the assumption of a general market equilibrium in which the expected prices follow a "random walk" under the restrictive precondition of fair market competition and homogeneity in behavior. Therefore, the results of this study do not rely on the realism of the theoretical assumptions, but on the acceptability of the implications. In this regard, with the obtained results, policy makers have clear evidence of the expected direct impact of the monetary policy adjustment on long-term expected results of the capital market. Similarly, it is evident that an improvement in industrial production has an imminent positive association with the performance of capital markets. On the contrary, rising inflation harms the performance of capital markets in the imminent term. Therefore, according to the obtained results, the impact of fiscal policies can be anticipated not only according to the direction of the association, but also through the lag from implementation to reaching the results of the impact. Nevertheless, this research does not study or adjust for frequently preconceived subpar judicial effectiveness, the presence of systemic corruption, and irrational behavioral traits that may act as important determining components in the operating environment. It is recommended that future research attempts to address these important open questions. Future research may also benefit from further expanding temporal coverage adding standardization and stability to performance. Similarly, it would be insightful to contrast market development and efficiency in comparable global regions with their transitioning process from planned to free markets (e.g. in the Baltics or Southeast Asia), but in their specific environments. Overall, this and future follow-up research may uncover new value by integrating additional qualitative influences into the endogeneity of research models. Important qualitative factors to consider may be the widely used indexes for the caliber of governance at state institutions, regulatory quality, judicial efficiency, corruption control, competition liberalization, etc. The prospects of these findings create new valuable information to a wider audience including researchers, policy makers, investors, etc.

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Appendix

Table 1 Descriptive statistics

Country	Indicator	SMI	GDPPC	MMIR	HICP	IPI	FDI	PI
Croatia	CAGR	-0.06%	2.46%	-2.58%	1.72%	0.01%	-0.99%	14.59%
	% of nominal change	-0.85%	45.78%	-33.33%	30.21%	0.12%	-13.59%	645.87%
	median	1855.19	10523.94	0.07	99.39	105.43	-1151.25	-141.89
	st. dev.	842.94	1159.55	0.02	6.79	6.86	822.83	978.41
	mean	2175.40	10873.69	0.06	96.14	105.42	-1323.52	-94.43
	min	1451.32	8765.44	0.03	80.72	92.07	-3661.94	-2139.18
	max	5239.03	13530.30	0.09	105.10	121.20	-111.62	1861.64
	skewness	2.41	0.76	0.13	-0.84	0.22	-1.09	0.00
	kurtosis	5.27	-0.22	-1.61	-0.44	-0.37	0.89	-0.49
Slovenia	CAGR	-0.28%	3.05%	-100%	1.71%	2.22%	10.91%	5.92%
	% of nominal change	-4.13%	59.41%	-100%	29.98%	40.48%	360.55%	133.45%
	median	832.37	18485.80	0.00	99.67	100.37	-330.39	759.96
	st. dev.	445.42	2173.19	0.01	6.75	12.60	560.27	3043.14
	mean	957.88	19121.91	0.01	97.14	103.74	-353.77	-137.64
	min	520.23	14881.06	0.00	81.85	84.57	-1619.57	-6878.51
	max	2623.68	23721.29	0.04	106.50	133.60	710.27	5023.88
	skewness	2.35	0.49	1.73	-0.77	0.66	-0.30	-0.45
	kurtosis	5.48	-0.34	1.84	-0.35	-0.69	-0.79	-0.85
B&H	CAGR	-1.29%	2.72%	-100%	1.25%	2.84%	-1.60%	32.67%
	% of nominal change	-13.88%	39.94%	-100%	21.20%	53.37%	-21.16%	6371.64%
	median	710.46	4163.56	0.01	99.70	97.55	-346.78	40.85
	st. dev.	89.18	537.53	0.01	4.89	8.90	278.16	64.52
	mean	728.67	4359.75	0.01	97.62	97.03	-418.20	56.26
	min	578.78	3724.26	0.00	83.44	69.63	-1434.44	-116.75
	max	944.18	5320.18	0.04	102.98	114.17	-98.81	222.77
	skewness	0.70	0.56	1.31	-1.38	-0.43	-2.19	0.81
	kurtosis	0.03	-1.17	0.42	0.90	0.42	5.06	1.12

Country	Indicator	SMI	GDPPC	MMIR	HICP	IPI	FDI	PI
Serbia	CAGR	-1.97%	6.27%	-12.90%	5.14%	0.23%	1.54%	2.23%
	% of nominal change	-26.48%	156.52%	-88.24%	117.46%	3.66%	22.97%	34.67%
	median	692.93	4577.98	0.09	96.67	104.43	-2041.41	-103.07
	st. dev.	558.83	1058.17	0.05	19.21	9.04	782.54	1040.62
	mean	867.57	4767.56	0.08	88.47	103.21	-2178.36	-365.15
	min	380.83	2790.46	0.01	52.50	86.57	-3750.10	-2935.54
	max	2849.35	7158.16	0.18	114.17	121.60	-752.84	1291.46
	skewness	2.58	0.60	0.25	-0.52	0.00	-0.29	-0.62
	kurtosis	6.19	-0.13	-0.75	-1.17	-0.83	-1.05	-0.18
North Macedonia	CAGR	5.53%	5.14%	-14.02%	2.01%	0.79%	-2.34%	2.87%
	% of nominal change	130.41%	117.37%	-90.38%	36.10%	13.00%	-29.50%	51.87%
	median	2538.86	3947.40	0.04	99.62	95.87	-247.05	-53.70
	st. dev.	1625.90	864.88	0.03	7.35	10.77	126.30	235.98
	mean	3087.91	4046.37	0.05	97.20	96.67	-278.18	-122.18
	min	1633.20	2488.35	0.01	80.70	73.80	-604.23	-967.11
	max	9283.00	5413.40	0.13	109.84	118.87	-12.79	161.55
	skewness	1.71	-0.02	0.77	-0.52	0.04	-0.53	-1.18
	kurtosis	3.20	-1.18	-0.33	-0.54	-0.46	-0.11	1.27
Montenegro	CAGR	0.79%	4.83%	-100%	2.26%	-3.59%	-2.30%	N/A
	% of nominal change	13.04%	98.24%	-100%	41.49%	-43.3%	-26.99%	-6716.8%
	median	11208.19	5409.13	0.01	99.20	104.00	-415.93	-29.62
	st. dev.	7639.89	1107.61	0.01	7.21	21.78	189.04	150.06
	mean	13910.21	5716.36	0.01	98.59	110.58	-485.69	-76.90
	min	8814.86	3511.64	0.00	76.09	68.30	-1114.46	-490.48
	max	40433.96	7924.18	0.04	107.67	167.60	-303.87	216.22
	skewness	2.59	0.34	1.31	-1.23	0.59	-2.14	-0.65
	kurtosis	5.97	-0.64	0.42	1.68	-0.36	4.56	0.16

Source: Authors

Table 2 Summary of the existent PMG pair relationship

Country	SMI	Panel PMG estimation on significant short-run relationship existence from macroeconomic indicators onto individual country's SMI	Aggregate regional data panel PMG estimation on significant long-run relationship existence from macroeconomic indicators onto SMIs	Aggregate regional data panel PMG estimation on significant long-run relationship existence from macroeconomic indicators onto SMIs
B&H	BATX		IPI+, PI-	MMIR-
Serbia	BELEX15			
North Macedonia	MBI10			
Croatia	CROBEX			
Slovenia	SBITOP			
Montenegro	MONEX	HICP-		

Note: A "+" sign marks positive relationship direction, and a "-" sign marks negative relationship direction.
Source: Authors

Table 3 Summary of the existent Johansen and Granger pair relationship

Country	SMI	Bivariate Johansen test on a long-run cointegrating relationship between SMI with the selected macroeconomic indicator	Bivariate Granger test on a causal relationship between SMI with the selected macroeconomic indicator: *-> indicates causality direction*
Croatia	*CROBEX*	MMIR, HICP, IPI, PI	
Slovenia	*SBITOP*	MMIR, HICP	SBITOP à IPI
B&H	*BATX*	HICP, IPI, FDI	
Serbia	*BELEX15*	HICP, FDI, PI	MMIR à BELEX15 FDI à BELEX15 BELEX15 à MMIR
North Macedonia	*MBI10*	PI	FDI à MBI10 MBI10 à IPI
Montenegro	*MONEX*	MMIR, IPI, FDI, PI	

Note: A "+" sign marks positive relationship direction, and a "-" sign marks negative relationship direction.
Source: Authors

Table 4 Results of ΔMAX and ΔTRACE statistics for pairs of SMI and selected macroeconomic variables with present cointegration. Johansen co-integration test results

Country	Pair of indicators	Hypothesized no. of CE(s)	λ_{trace}	5% critical value	λ_{max}	5% critical value
Croatia	CROBEX to MMIR 2006Q2-2021Q2 (2)	None*	15.5944	15.41	13.1591	14.07
		At most 1	2.4353	3.76	2.4353	3.76
	CROBEX to HICP 2006Q3-2021Q2 (3)	None*	29.7508	15.41	21.6551	14.07
		At most 1	8.0957	3.76	8.0957	3.76
	CROBEX to IPI 2006Q3-2021Q2 (4)	None*	16.0486	15.41	14.4369	14.07
		At most 1	1.6117	3.76	1.6117	3.76
	CROBEX to PI 2006Q4-2021Q2 (1)	None*	16.8832	15.41	13.7514	14.07
		At most 1	3.1318	3.76	3.1318	3.76
Slovenia	SBITOP to MMIR 2008Q1-2021Q2 (4)	None*	76.5901	15.41	74.5257	14.07
		At most 1	2.0644	3.76	2.0644	3.76
	SBITOP to HICP 2006Q4-2021Q2 (2)	None*	19.7491	15.41	14.7349	14.07
		At most 1	5.0143	3.76	5.0143	3.76
B&H	BATX to HICP 2010Q1-2021Q4 (1)	None*	16.8104	15.41	12.5973	14.07
		At most 1	4.2132	3.76	4.2132	3.76
	BATX to IPI 2010Q1-2021Q4 (1)	None*	25.3417	15.41	18.3015	14.07
		At most 1	7.0402	3.76	7.0402	3.76
	BATX to FDI 2010Q2-2021Q4 (2)	None*	23.7261	15.41	17.2795	14.07
		At most 1	6.4466	3.76	6.4466	3.76
Serbia	BELEX15 to HICP 2006Q3-2021Q2 (3)	None*	16.6718	15.41	15.2434	14.07
		At most 1	1.4284	3.76	1.4284	3.76
	BELEX15 to FDI 2008Q2-2021Q2 (2)	None*	32.4617	15.41	28.5571	14.07
		At most 1	3.9046	3.76	3.9046	3.76
	BELEX15 to PI 2008Q2-2021Q2 (2)	None*	26.3660	15.41	22.3518	14.07
		At most 1	4.0142	3.76	4.0142	3.76
North Macedonia	MBI10 to PI 2006Q4-2021Q2 (1)	None*	17.1148	15.41	14.9582	14.07
		At most 1	2.1566	3.76	2.1566	3.76

Country	Pair of indicators	Hypothesized no. of CE(s)	λ_{trace}	5% critical value	λ_{max}	5% critical value
Montenegro	MONEX to MMIR 2006Q2-2021Q2 (2)	None*	19.8272	15.41	17.0838	14.07
		At most 1	2.7434	3.76	2.7434	3.76
	MONEX to IPI 2006Q1-2021Q2 (1)	None*	31.5948	15.41	26.4859	14.07
		At most 1	5.1089	3.76	5.1089	3.76
	MONEX to FDI 2008Q4-2021Q2 (4)	None*	34.8046	15.41	18.8159	14.07
		At most 1	15.9886	3.76	15.9886	3.76
	MONEX to PI 2008Q4-2021Q2 (4)	None*	25.2682	15.41	16.6475	14.07
		At most 1	8.6207	3.76	8.6207	3.76

Note: Optimal selection order criteria are shown per quarter and determined by SBIC. The selection of lags is presented in parentheses (). *The null hypothesis is rejected at the 5% level ($p<0.05$). For example, the first row in the case of Croatia shows a CROBEX to MMIR cointegrating relationship with one cointegrating vector. None of the significant results revealed two or more cointegrating vectors.

Source: Authors

Table 5 Granger causality test results

Country	SMI	GDPPC	MMIR	HICP	IPI	FDI	PI
Direction of selected macroeconomic indicator causality on the stock exchange index.							
Croatia	CROBEX	1.982 (0.371)	NA***	NA***	NA***	0.048 (0.827)	NA***
Slovenia	SBITOP	0.250 (0.882)	NA***	NA***	0.133 (0.936)	0.032 (0.984)	0.078 (0.962)
B&H	BATX	0.381 (0.537)	2.987 (0.084)	NA***	NA***	NA***	0.386 (0.534)
Serbia	BELEX15	1.130 (0.568)	14.106** (0.003)	NA***	2.524 (0.640)	NA***	NA***
North Macedonia	MBI10	1.791 (0.181)	2.404 (0.121)	0.007 (0.933)	9.130 (0.058)	3.835* (0.050)	NA***
Montenegro	MONEX	0.174 (0.917)	NA***	0.130 (0.718)	NA***	NA***	NA***
Direction of stock exchange index causality on the selected macroeconomic indicator.							
Croatia	CROBEX	5.911 (0.052)	NA***	NA***	NA***	*1.954 (0.162)*	NA***
Slovenia	SBITOP	3.432 (0.180)	NA***	NA***	7.310* (0.026)	0.488 (0.783)	2.020 (0.364)
B&H	BATX	0.640 (0.424)	1.062 (0.303)	NA***	NA***	NA***	0.038 (0.845)
Serbia	BELEX15	1.992 (0.369)	19.855** (0.000)	NA***	9.120 (0.058)	NA***	NA***
North Macedonia	MBI10	1.788 (0.181)	1.409 (0.235)	0.046 (0.830)	10.983* (0.027)	2.962 (0.085)	NA***
Montenegro	MONEX	2.294 (0.318)	NA***	1.147 (0.284)	NA***	NA***	NA***

Note: A chi^2-value shown on top, and a p-value shown in brackets (). Optimal selection order criteria are shown per quarter and determined by SBIC. * p<0.05, ** p<0.01. ***Due to the established existence of statistically significant cointegration relationships of a pair of indicators or due to the unavailability of Johansen test results for the given pair of indicators, the Granger test and the results as such are misspecified. In such cases, reparameterization into an error correction model is necessary and is completed in this research with panel PMG results.

Macroeconomic indicators that cause the impact of SMI prove to be MMIR in the case of Serbia and FDI in the case of North Macedonia. In contrast to a directional relationship impact, SMI significantly impacts MMIR in Serbia, and IPI in two cases, i.e., in Slovenia and in North Macedonia.

Source: Authors

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INVESTIGATION OF THE EFFECT OF WORKING CAPITAL MANAGEMENT ON PROFITABILITY BY PANEL DATA ANALYSIS AND MULTI-CRITERIA DECISION MAKING TECHNIQUES*

Abstract

Purpose: The aim of this study is to reveal and compare the effect of working capital management on return on assets with different analysis methods, based on the annual financial statement data of companies in the tourism sector traded in Borsa Istanbul (BIST) in the period 2012-2020. This study aimed to reveal the drawbacks of including in the model variables that are not an element of working capital management.

Methodology: Panel data analysis, the analytical hierarchy process and the fuzzy analytical hierarchy process were used to reveal the effect of working capital management variables on return on assets based on the financial statement data of the companies.

Results: As a result of the analysis, a significant relationship was identified between the rankings made by using the realized return on assets ratios and the rankings obtained by AHP and FAHP, while no significant relationship was found between the rankings obtained by panel data analysis.

Conclusion: Including some variables in the model as a working capital management variable in panel data analysis may cause misinterpretation of the effects of real working capital variables on return on assets. When the model that emerged according to the AHP and FAHP methods was examined, the asset turnover rate and financial leverage ratio variables were determined as the ratios with the lowest effect on return on assets, as the elements of working capital management in the weighting made according to the opinions of the experts.

Keywords: Working capital management, profitability, panel data, analytical hierarchy process

* This study is derived from the summary statement presented at the 21st International Business Congress held 12-14 May 2022.

1. Introduction

The shareholders of the enterprises want their investments to result in profit, as well as the increase in the value of the enterprise and the growth of the capital they invest in the enterprise. This expectation requires enterprises to be managed with a correct capital structure, and working capital, which plays a key role in the execution of business activities, to be determined at an optimal level. Working capital management, which constitutes the current assets of the enterprise, is one of the most important determinants of profitability and risk factors. The amount of working capital, which is usually kept at low levels to increase profitability, may increase some risks that the business faces. The amount of working capital, which is determined at a high level in order to keep the risks at a minimum level, may reduce profitability. Therefore, business managers make a choice between profitability and risk by determining the level of working capital according to the strategy they determine.

It can be seen that the studies carried out to measure the impact on enterprise profitability in the case of managing the working capital elements in line with the determined strategy focus on inventory management, debt collection processes, debt maturities and the cash cycle that should be obtained from the trade spiral. The literature, which shows that variables calculated for different elements of working capital such as the inventory turnover rate, the receivables turnover rate, the cash conversion cycle, the current ratio, and the financial leverage ratio, have an effect on profitability, reveals that there is a significant relationship between working capital management and business profitability. In a significant part of the studies, it can be seen that regression analyses are used to determine the relationship between working capital management and profitability. The models established in all of these studies revealed different coefficient results. Factors such as the fact that the examined companies are in different sectors and have different characteristics normalize the differentiation of the results. However, it is also possible to reveal the effect of working capital management on profitability based on the professional competence and experience of academics who are experts in the field of accounting and finance, and to establish a model by using these effects. This study has two focuses; the first is to identify a model that can be compared with the differing results of econometric analyses to reveal the effect of working capital management on profitability, based on the experience of the relevant literature and experts. The second is to compare the realized profitability rates with the company rankings to be made according to the model results of the methods. The focuses in question reveal the difference and the original value of the study from the studies in the literature.

The aim of this study is to reveal and compare the effect of working capital management on profitability by using different analysis methods based on the annual financial statement data of 6 companies traded in Borsa Istanbul (BIST) between 2012 and 2020. When the literature is examined, it can be seen that many studies including different variables have been conducted to reveal the effects of working capital management on profitability. However, in some of the studies, it has been observed that some variables that are not actually a working capital management element are also included in the models. This study aims to reveal the drawbacks of including variables that are not an element of working capital management in the model. In order to reveal the effects of working capital management on return on assets, firstly, panel data analysis will be made based on the actual data. In the continuation of the study, the effects of working capital management variables on profitability will be weighted using the "Analytical Hierarchy Process (AHP)" and "Fuzzy Analytical Hierarchy Process (FAHP)" methods, based on the opinions of academics who are experts in the field of accounting and finance, and models based on these weights will be established. Finally, the return on assets ratios will be calculated using the models revealed by the methods, and the profitability rankings of the companies will be made and compared according to different methods by comparing them with the real ratios.

2. Literature review

Some of the studies examining the relationship between profitability and working capital management in the literature which are thought to be close to the purpose of the research are summarized in Table 1. The studies were handled in the form of country, period, dependent and independent variables, methods and findings.

Table 1 Literature review

Author(s)	Country	Period	Dependent variables	Independent variables	Methods	Findings
Mohamad and Saad (2010)	Malaysia	2003-2007	Tobin's Q, ROA, ROIC	CCC, CR, CATAR, CLTAR, DTAR	Correlations / Multiple regression analysis	negative relationship
Charitou et al. (2010)	Cyprus	1998-2007	ROA	CCC, ST, DEBTOR, CREDITOR	Multiple regression analysis	negative relationship
Gill et al. (2010)	USA	2005-2007	GOP	AR, LnS, FD, FFA	Correlations / Multiple regression analysis	positive relationship
Sharma and Kumar (2011)	India (Mumbai)	2000-2008	ROA	AR, INV, AP, CCC, GROWTH, LEV, CR	OLS multiple regression	positive relationship
Vahid et al. (2012)	Iran	2006-2009	OPR	ACP, ITID, APP, CCC, NTC	Correlations / OLS multiple regression	positive relationship
Ukaegbu (2014)	Egypt, Kenya, Nigeria and South Africa	2005-2009	GOP	AR, CCC, INVE, AP, GDP, CG	Correlations / Multiple regression analysis	negative relationship
Korkmaz and Yaman (2019)	Turkey	2011-2017	OPR	CCC, STP, DEBTOR, CR, FLR, GROWTH	Panel data analysis	negative relationship
Akomeah and Frimpong (2019)	Ghana	2005-2014	GOP	AR, APP, ICP, CCC	Fixed effects panel data regression	negative relationship
Yıldız and Deniz (2020)	Turkey	2010-2018	ROA, ROE	APR, CR, LR, RTR, ST, CR, DTR, CCC, FLR	Panel data method	positive relationship
Nguyen, et al. (2020)	Vietnam	2010-2018	ROA, Tobin's Q	CCC, AR, ST, APD	OLS / FEM	negative relationship
Erdogan and Turkmen (2021)	Turkey	2010-2018	ROA	DSO, DIO, DPO, CCC	Cross-sectional / Time series data analysis	negative relationship
Islıcık and Çil Koçyiğit (2021)	Turkey	2016	ROA	ST, RTR, CCC, NWCR	Multiple regression analysis	positive relationship
Babacan and Tuncay (2022)	Turkey	2014-2020	ROA	CR, RTR, DEBTOR, FLR	SWARA, AHP, TOPSIS	positive relationship

ROA: Return on asset, ROE: Return on equity, ROIC: Return on invested capital, Tobin's Q: Market value, CCC: Cash conversion cycles, CR: Current ratio, CATAR: Current asset to total asset ratio, CLTAR: Current liabilities to total asset ratio, DTAR: Debt to asset ratio, DEBTOR: Debtor collection period, CREDITOR: Creditor payment period, GOP: Gross operating profit, AR: Accounts receivables, LnS: Natural logarithm of sales, FD: Financial debt ratio, FFA: Fixed financial asset ratio, INV: Number of days in inventory, AP: Accounts payable, GROWTH: Sales growth, LEV: Leverage, ACP: Average collection period, ITID: Inventory turnover in days, APP: Average payment period, NTC: Net trading cycle, INVE: Inventories turnover, GDP: Gross domestic product growth, CG: Corporate governance, OPR: Operating profitability ratio, ICP: Inventory conversion period, APR: Asset profitability ratio, LR: Liquid ratio, RTR: Receivable turnover rate, ST: Stock turnover, DTR: Debt turnover rate, FLR: Financial leverage ratio, APD: Accounts payable in days, DSO: Days sales outstanding, DIO: Days inventory outstanding, DPO: Days payable outstanding, RTR: Receivable turnover rate, NWCR: Net working capital ratio.
Source: Authors' research

In a significant part of the studies in the literature, the effect of working capital management variables on return on assets was revealed by panel data analysis. This study differs from the literature by using the heuristic methods AHP and FAHP together in addition to panel data analysis. This difference reveals the original value of the study.

3. Research method

This study was carried out to reveal the effect of working capital management on return on assets with different analysis methods based on the financial statement data of the companies included in the BIST Tourism Index in the period 2012-2020 and to compare the results. There are 8 companies in the BIST Tourism Index. Two companies were excluded from the scope of the study due to incomplete data. Therefore, the scope of the study consists of 6 companies. These companies are as follows: *"Altınyunus Çeşme Turistik Tesisler Inc. (AYCES)", "Avrasya Petrol ve Turistik Tesisler Yatırımlar Inc. (AVTUR)", "Marmaris Altınyunus Turistik Tesisler Inc. (MAALT)", "Martı Otel İşletmeleri Inc. (MARTI)", "Petrokent Turizm A.Ş. (PKENT)",* and *"Tek-Art İnşaat Ticaret Turizm ve Yatırımlar Inc. (TEKTU).*

Three different methods were used to reveal the effect of working capital management on the return on assets ratio. First, panel data analysis was used to reveal the effect of working capital management variables on return on assets based on the financial statement data of the companies. The second and the third method used in the study are the analytical hierarchy process (AHP) and the fuzzy analytical hierarchy process (FAHP), in which the weights of the working capital management variables that have an impact on return on assets are determined based on expert opinion. The effect of working capital management variables on return on assets will be revealed by all three methods, and according to the results obtained, companies will be ranked and compared based on the return on assets ratio.

Eight variables were used in the study. The dependent variable of the study is "Return on assets", and the independent variables are "Receivable turnover", "Inventory turnover", "Asset turnover", "Working capital turnover", "Financial leverage ratio", "Current ratio" and "Cash conversion cycle". Information on the calculation of the variables is presented in Table 2.

Table 2 Variables used in the study

Variables	Financial ratios	Variable code	Formulas
Dependent variable	"Return on assets"	ROA	Net profit / Total assets
Independent variables	"Receivable turnover"	RTR	"Net sales / Average trade receivables"
	"Inventory turnover"	ITR	"Cost of sales / Average stocks"
	"Asset turnover"	ATR	"Net sales / Average total assets"
	"Working capital turnover"	WCTR	"Net sales / Average net working capital"
	"Financial leverage ratio"	FLR	"Total liabilities / Total assets"
	"Current ratio"	CR	"Current assets / Short-term liabilities"
	"Cash conversion cycle"	CCC	"Receivable collection period + Stock-holding period – Debt maturity structure"

Source: Authors' research

In the study, panel data analysis will be made using STATA and EViews package programs to reveal the effect of independent variables on the dependent variable. Then, weighting of working capital management variables as determinants of return on assets will be made by using the *"Analytical Hierarchy Process (AHP)"* and *"Fuzzy Analytical Hierarchy Process (FAHP)"* methods based on expert opinion.

Panel data analysis is an econometric analysis method that examines a particular subject in more than one cross-section that is regularly observed in a particular period. Panel data analysis in the

field of social sciences enables researchers to make longitudinal analysis in different fields (Hill et al., 2011).

AHP, one of the multi-criteria decision-making methods, is used to choose among alternatives. The criteria discussed here can be qualitative or quantitative. In AHP, the knowledge and experience of decision makers can be included in the decision-making phase (Ecer & Küçük, 2008). If there are n criteria for the purpose, the A matrix is prepared in nxn dimensions. The matrix in question shows the importance values of the i^{th} row element relative to the j^{th} column element. These values consist of the numbers in the scale shown in Table 3.

Table 3 AHP significance scale

Degree	Definition	Explanation
1	"Equally important"	"The two criteria are equally effective"
3	"Moderately important"	"Opinions slightly favor one criterion over the other"
5	"Strongly important"	"Opinions strongly favor one criterion over the other"
7	"Very strongly important"	"One criterion is strongly preferred over the other, the difference can be easily seen in practice."
9	"Extremely important"	"One criterion is stronger preferred than the other, the reliability of evidence is high."
2, 4, 6, 8	"Intermediate (average) values"	"If undecided between two consecutive levels for the criteria, it is used as the mean value."

Source: Byun, 2001

The application stages of FAHP differ according to the methods to be used. FAHP methods in the literature may require complex arithmetic operations. Further clarification and simplification may be required to obtain a precise result. On the other hand, since calculations are made by the intersection method of fuzzy numbers, problems such as greater clarity, clarification and computational density can be eliminated in the method developed by Chang (1996).

The scale in the creation of pairwise comparison matrices used in the fuzzy AHP algorithm is given in Table 4 (Paksoy et al., 2013).

Table 4 Linguistic values and fuzzy number equivalents used in FAHP

Linguistic expressions	Fuzzy numbers	
	Fuzzy scale	Counter scale
"Equally important"	1, 1, 1	1/1, 1/1, 1/1
"Moderately important"	1, 3, 5	1/5, 1/3, 1/1
"Strongly important"	3, 5, 7	1/7, 1/5, 1/3
"Very strongly important"	5, 7, 9	1/9, 1/7, 1/5
"Absolutely important"	7, 7, 9	1/9, 1/9, 1/7
"Intermediate values"	1, 2, 3 3, 4, 5 5, 6, 7 7, 8, 9	1/3, 1/2, 1/1 1/5, 1/4, 1/3 1/7, 1/6, 1/5 1/9, 1/8, 1/7

Source: Paksoy et al., 2013

4. Findings

4.1 Panel data analysis

The regression equation created by using dependent and independent variables in the study is as follows: $ROA_{it} = \beta_0 + \beta_1 RTR_{it} + \beta_2 ITR_{it} + \beta_3 ATR_{it} + \beta_4 WCTR_{it} + \beta_5 FLR_{it} + \beta_6 CR_{it} + \beta_7 CCC_{it} + e_{it}$

Descriptive statistics for dependent and independent variables in the study are given in Table 5.

Table 5 Summary information on variables

Variable	Average	Std. deviation
ROA	0.0003824	0.0793557
RTR	15.72936	22.50568
ITR	88.10542	94.14795
ATR	0.2166834	0.3151207
WCTR	-0.7904494	3.566094
FLR	0.35274	0.2627728
CR	3.04811	4.787623
CCC	23.47201	98.0243

Source: Authors' calculations

It can be seen in Table 5 that the average of the dependent variable return on assets is low (0.0003824). This situation shows that the profitability levels of the companies are low and they have declared losses in many years. The average values of the independent variables are 15.73 for receivable turnover, 88.11 for inventory turnover, 0.22 for asset turnover, -0.79 for the working capital turnover ratio, 0.35 for the financial leverage ratio, and 3.05 for the current ratio. Furthermore, the cash conversion cycle was 23.47.

In the study, cross-sectional dependence between the variables was examined and it was decided which unit root test should be used. Then, "unit root analysis" was used to test the stationarity of the series, and by the "panel cointegration" test it was examined whether there was a long-term relationship between the variables included in the analysis. Finally, the "panel data analysis method" was used to estimate the correlation coefficients between the variables.

Pesaran's (2015) "cross-section dependency test" was conducted to determine whether there was cross-sectional dependence between the variables in the panel data set. The test result is given in Table 6.

Table 6 Horizontal section dependency test

	Statistics	Probability value (p)
Model	-1.358	0.1745

Source: Authors' calculations

The probability (p) value shows that there is no cross-sectional dependence in the panel. In this case, it would be more accurate to use first generation unit root analyses to test the stationarity of the series.

In the study, the Levin, Lin and Chu (2002) test, which is one of the first generation unit root tests, was used to test the stationarity of the series, since there is no cross-sectional dependence. The LLC test results are shown in Table 7.

Table 7 LLC unit root test (Stationary)

	Level	
Variable	**Statistics**	**Probability (p)**
ROA	-3.24421	0.0006*
RTR	-2.03083	0.0211**
ITR	-2.65915	0.0039*
ATR	-4.10486	0.0000*
WCTR	-5.39745	0.0000*
FLR	-2.28588	0.0111**
CR	-4.97891	0.0000*
CCC	-3.81416	0.0001*

Significant at *0.01 and **0.05 significance levels.
Source: Authors' calculations

According to Table 7, it can be seen that the ROA, ITR, ATR, WCTR, CR and CCC variables are stationary at the 1% significance level, while the RTR and FLR variables are stationary at the 5% significance level.

The existence of a long-term relationship between the series forming the panel was tested with the Kao (1999) cointegration test. In the Kao (1999) cointegration test, the null hypothesis is established as "there is no cointegration" (Ballı et al., 2018). The cointegration test results are presented in Table 8.

Table 8 Panel cointegration test (long-term relationship)

	Statistics	Probability value(p)
Kao cointegration (ADF)	-4.829668	0.0000*

*Significant at the 1% significance level.
Source: Authors' calculations

The cointegration test results reveal the existence of a long-term significant relationship between the variables that make up the series in all companies at the 1% significance level.

In the last stage, the panel data analysis method was used to estimate the coefficients of the long-term relationship determined as a result of the cointegration test. Model estimation results are shown in Table 9.

Table 9 Panel data analysis results (coefficient estimation)

Variable	Coefficient	Standard deviation	Probability (p)
RTR	0.000298	0.000569	0.6031
ITR	0.000224	0.000143	0.1248
ATR	0.115347	0.028440	0.0002*
WCTR	0.005009	0.002616	0.0618**
FLR	-0.101024	0.034456	0.0052*
CR	0.002564	0.002455	0.3016
CCC	0.0000296	0.0000902	0.7442
Const.	-0.017930	0.021338	0.4051
R^2	0.568827		
Adj. R^2	0.503214		
Dependent variable Return on Assets (ROA)			

Significant at *1% and **10% significance levels.
Source: Authors' calculations

In Table 9, it can be seen that the R^2 value is 56.9%. Accordingly, working capital management variables explain approximately 57% of the return on assets ratio. When the probability values are examined, it can be seen that the asset turnover rate and the financial leverage ratio, which are among the working capital management variables, have a significant effect at the 1% significance level. Moreover, the working capital turnover ratio has a significant effect on return on assets at the 10% significance level. While the asset turnover (0.115347) and the working capital turnover ratio (0.005009) positively affect the return on assets ratio, the financial leverage ratio (-0.101024) affects it negatively. According to the results of panel data analysis using the panel data analysis method, the model of the study can be created as follows:

$$ROA_{it} = -0.017930 + 0.000298\ RTR_{it} + 0.000224\ ITR_{it} + \mathbf{0.115347\ ATR_{it}} + \mathbf{0.005009\ WCTR_{it}} - \mathbf{0.101024\ FLR_{it}} + 0.002564\ CR_{it} + 0.0000296\ CCC_{it}$$

4.2 Analytical hierarchy process

The working capital management variables that affect return on assets of tourism companies in BIST will be weighted using the AHP method. As a result of this weighting, the return on assets ratios of tourism companies in BIST will be recalculated and the ranking of tourism companies will be obtained.

Step 1: Creation of selection criteria and decision alternatives

There are various financial ratios used in working capital management. By examining the literature, 7 ratios are discussed as working capital management determinants.

Step 2: Preparation of pairwise comparison matrices

A pairwise comparison between the working capital management variables affecting return on assets was prepared by considering the answers given to the comparison questions of 19 faculty members who are experts in the field of accounting and finance. By taking the geometric mean of the answers, the pairwise comparison matrix (A) was formed as follows.

AHP binary comparison matrix

	Financial ratios	RTR	ITR	ATR	FLR	CR	CCC	WCTR
A =	RTR	1.00	2.00	2.00	1.00	1.00	1.00	1.00
	ITR	0.50	1.00	1.00	1.00	1.00	1.00	0.50
	ATR	0.50	1.00	1.00	1.00	0.50	1.00	0.33
	FLR	1.00	1.00	1.00	1.00	0.50	0.50	0.33
	CR	1.00	1.00	2.00	2.00	1.00	1.00	0.50
	CCC	1.00	1.00	1.00	2.00	1.00	1.00	0.50
	WCTR	1.00	2.00	3.00	3.00	2.00	2.00	1.00
	Total	**6.00**	**9.00**	**11.00**	**11.00**	**7.00**	**7.50**	**4.17**

Step 3: Normalizing the binary comparison matrix

Each of the values in the pairwise comparison matrix created in step 2 is normalized by dividing by the column totals. By normalizing, this matrix was formed as follows.

AHP normalized matrix

	Financial ratios	RTR	ITR	ATR	FLR	CR	CCC	WCTR
N =	RTR	0.17	0.22	0.18	0.09	0.14	0.13	0.24
	ITR	0.08	0.11	0.09	0.09	0.14	0.13	0.12
	ATR	0.08	0.11	0.09	0.09	0.07	0.13	0.08
	FLR	0.17	0.11	0.09	0.09	0.07	0.07	0.08
	CR	0.17	0.11	0.18	0.18	0.14	0.13	0.12
	CCC	0.17	0.11	0.09	0.18	0.14	0.13	0.12
	WCTR	0.17	0.22	0.27	0.27	0.29	0.27	0.24

Step 4: Establishment of weights (severity degrees) of selection criteria

By calculating the row averages of the N matrix created in the 3rd step, the percentage weights of the selection criteria are determined. These determined weights are created in the w_{AHP} column vector. The sum of this w column vector created must be equal to one.

	RTR	0.169
	ITR	0.110
	ATR	0.094
$\mathbf{W}_{AHP}$=	FLR	0.097
	CR	0.148
	CCC	0.135
	WCTR	0.247

The weights of the ratios are determined by the w_{AHP} column vector. It can be seen that the "working capital turnover ratio" has the greatest importance among the ratios with a weight of 24.7%. Then, the rest were determined as follows: the "receivable turnover rate" with a 16.9% weight, the "current ratio" with a 14.8% weight, the "cash conversion time" with a 13.5% weight, the "stock turnover rate" with a weight of 11%, the "financial leverage ratio" with a weight of 9.7%, and the "asset turnover ratio" with a weight of 9.4%.

Step 5: Consistency analysis

The priority vector e is calculated by multiplying the matrix A with the vector w_{AHP}.

	RTR	1.20
	ITR	0.79
	ATR	0.68
e =	FLR	0.69
	CR	1.07
	CCC	0.97
	WCTR	1.78

The λ_{max} value is found by dividing the total value of the vector e by the number of factors. It is calculated as follows:

$$\lambda_{max} = \frac{(\sum_{(i=1)}^{n} e)}{n} = \frac{50.28}{7} = 7.18 .$$

Then *CI* and *CR* values are calculated as:

$$CI = \frac{(\lambda_{max}\text{-}n)}{(n\text{-}1)} = \frac{(7.18\text{-}7)}{(7\text{-}1)} = 0.03 \quad \text{and}$$

$$CR = \frac{CI}{RI} = \frac{0.03}{1.32} = 0.02 .$$

(The RI value stated in Saaty (1980) was taken as 1.32 since there are 7 financial ratios). Since *CR*< 0.10, the evaluations are considered to be consistent.

Step 6: Ranking of selection alternatives

The ratios used in working capital management are multiplied by the weights obtained by AHP, and the return on assets ratios of the companies are calculated and a new ranking is made accordingly.

4.3 Fuzzy analytical hierarchy process

Since there are many experts in the decision process, the geometric mean of the answers given by the experts was calculated and a single group of numbers was found for each comparison. The resulting pairwise comparison matrix is presented below.

FAHP pairwise comparison matrix

Financial ratios	*RTR*	*ITR*	*ATR*	*FLR*	*CR*	*CCC*	*WCTR*
RTR	**1,1,1**	1,2,3	1,2,3	1,1,1	1,1,1	1,1,1	1,1,1
ITR	1/3,1/2,1/1	**1,1,1**	1,1,1	1,1,1	1,1,1	1,1,1	1/3,1/2,1/1
ATR	1/3,1/2,1/1	1,1,1	**1,1,1**	1,1,1	1/3,1/2,1/1	1,1,1	1/5,1/3,1/1
FLR	1,1,1	1,1,1	1,1,1	**1,1,1**	1/3,1/2,1/1	1/3,1/2,1/1	1/5,1/3,1/1
CR	1,1,1	1,1,1	1,2,3	1,2,3	**1,1,1**	1,1,1	1/3,1/2,1/1
CCC	1,1,1	1,1,1	1,1,1	1,2,3	1,1,1	**1,1,1**	1/3,1/2,1/1
WCTR	1,1,1	1,2,3	1,3,5	1,3,5	1,2,3	1,2,3	**1,1,1**

According to Chang's FAHP algorithm, each S_i values was obtained as follows:

S_{RTR} = (7, 9, 11) ⊗ (1/73, 1/55.66, 1/42.04) = (0.096, 0.162, 0.262)

S_{ITR} = (5.66, 6, 7) ⊗ (1/73, 1/55.66, 1/42.04) = (0.078, 0.108, 0.167)

S_{ATR} = (4.86, 5.33, 7) ⊗ (1/73, 1/55.66, 1/42.04) = (0.067, 0.096, 0.167)

S_{FLR} = (4.86, 5.33, 7) ⊗ (1/73, 1/55.66, 1/42.04) = (0.067, 0.096, 0.167)

S_{CR} = (6.33, 8.50, 11) ⊗ (1/73, 1/55.66, 1/42.04) = (0.087, 0.153, 0.262)

S_{CCC} = (6.33, 7.50, 9) ⊗ (1/73, 1/55.66, 1/42.04) = (0.087, 0.153, 0.214)

S_{WCTR} = (7, 14, 21) ⊗ (1/73, 1/55.66, 1/42.04) = (0.096, 0.251, 0.500)

After these values were found, the V ($M_2 \geq M_1$) values for each factor were calculated using equation (7) as follows:

$V(S_{RTR} \geq S_{ITR}) = 0.568$, $V(S_{RTR} \geq S_{ATR}) = 0.518$, $V(S_{RTR} \geq S_{FLR}) = 1$, $V(S_{RTR} \geq S_{CR}) = 0.949$, $V(S_{RTR} \geq S_{CCC}) = 0.814$, $V(S_{RTR} \geq S_{WCTR}) = 1$

$V(S_{ITR} \geq S_{RTR}) = 1$, $V(S_{ITR} \geq S_{ATR}) = 0.881$, $V(S_{ITR} \geq S_{FLR}) = 0.881$, $V(S_{ITR} \geq S_{CR}) = 1$,

$V(S_{ITR} \geq S_{CCC}) = 1$, $V(S_{ITR} \geq S_{WCTR}) = 1$

$V(S_{ATR} \geq S_{RTR}) = 1$, $V(S_{ATR} \geq S_{ITR}) = 1$, $V(S_{ATR} \geq S_{FLR}) = 1$, $V(S_{ATR} \geq S_{CR}) = 1$, $V(S_{ATR} \geq S_{CCC}) = 1$, $V(S_{ATR} \geq S_{WCTR}) = 1$

$V(S_{FLR} \geq S_{RTR}) = 1$, $V(S_{FLR} \geq S_{ITR}) = 1$, $V(S_{FLR} \geq S_{ATR}) = 1$, $V(S_{FLR} \geq S_{CR}) = 1$, $V(S_{FLR} \geq S_{CCC}) = 1$, $V(S_{FLR} \geq S_{WCTR}) = 1$

$V(S_{CR} \geq S_{RTR}) = 1$, $V(S_{CR} \geq S_{ITR}) = 0.640$, $V(S_{CR} \geq S_{ATR}) = 0.584$, $V(S_{CR} \geq S_{FLR}) = 0.584$, $V(S_{CR} \geq S_{CCC}) = 0.876$, $V(S_{CR} \geq S_{WCTR}) = 1$

$V(S_{CCC} \geq S_{RTR}) = 1$, $V(S_{CCC} \geq S_{ITR}) = 0.748$, $V(S_{CCC} \geq S_{ATR}) = 0.672$, $V(S_{CCC} \geq S_{FLR}) = 0.672$, $V(S_{CCC} \geq S_{CR}) = 1$, $V(S_{CCC} \geq S_{WCTR}) = 1$

$V(S_{WCTR} \geq S_{RTR}) = 0.651$, $V(S_{WCTR} \geq S_{ITR}) = 0.332$, $V(S_{WCTR} \geq S_{ATR}) = 0.314$, $V(S_{WCTR} \geq S_{FLR}) = 0.314$, $V(S_{WCTR} \geq S_{CR}) = 0.629$, $V(S_{WCTR} \geq S_{CCC}) = 0.504$

By using the V values, the priority values of the factors were obtained with the help of equation (9):

$d'(F_1) = \min [V(S_{RTR} \geq S_j)] = 0.651$

$d'(F_2) = \min [V(S_{ITR} \geq S_j)] = 0.332$

$d'(F_3) = \min [V(S_{ATR} \geq S_j)] = 0.314$

$d'(F_4) = \min [V(S_{FLR} \geq S_j)] = 0.314$

$d'(F_5) = \min [V(S_{CR} \geq S_j)] = 0.629$

$d'(F_6) = \min [V(S_{CCC} \geq S_j)] = 0.504$

$d'(F_7) = \min [V(S_{WCTR} \geq S_j)] = 1.000$

According to Chang's FAHP algorithm, each S_i values was obtained and after calculating the priority values, the priority vector is found as follows:

$W' = (0.651, 0.332, 0.314, 0.314, 0.629, 0.504, 1.000)$

By normalizing this vector, the weights of the factors were found and shown with W_{FAHP}.

$$W_{FAHP} = \begin{matrix} RTR \\ ITR \\ ATR \\ FLR \\ CR \\ CCC \\ WCTR \end{matrix} \begin{matrix} 0.174 \\ 0.089 \\ 0.084 \\ 0.084 \\ 0.168 \\ 0.135 \\ 0.267 \end{matrix}$$

The weights of each ratio are determined by the W_{FAHP} column vector. It can be seen that the "working capital turnover ratio" has the greatest importance among the ratios with a weight of 26.7%. Weights of other ratios are 17.4% for "receivable turnover", 16.8% for the "current ratio", 13.5% for the "cash conversion time", 8.9% for the "stock turnover", 8.4% for "financial leverage" and 8.4% for the "asset turnover rate".

5. Discussion

The results of the panel data analysis method, AHP and BAHP methods, which are used to estimate firm profitability using working capital management variables, will be discussed in this section. The estimated and actual return on assets of the companies are presented in Table 10.

Table 10 Profitability rates of tourism companies

Tourism companies	Realized profitability rate	Profitability rate estimated by regression	Profitability rate estimated by AHP	Profitability rate estimated by FAHP
AYCES	-0.012094559	-0.025744161	4.211840815	3.161849558
AVTUR	0.022355364	0.011941319	26.02221004	23.46745768
MAALT	0.058200271	0.069409342	32.04099344	27.75027647
MARTI	-0.073069341	-0.081945587	-2.890704616	-3.154473348
PKENT	0.016670865	0.040404973	14.48263894	13.97764758
TEKTU	-0.009768392	-0.011652037	19.70526358	17.9704873

Source: Authors' calculations

It can be seen in Table 10 that there are differences between the obtained ratios because the calculation methods are different. For this reason, it would be more accurate to compare the methods, not in terms of the calculated values, but in terms of the rankings of the companies. Table 11 shows the rankings of the companies.

Table 11 Rankings of tourism companies

Ranking by realized profitability	Ranking by estimated profitability with Regression	Ranking by estimated profitability with AHP	Ranking by estimated profitability with FAHP
MAALT	MAALT	MAALT	MAALT
AVTUR	PKENT	AVTUR	AVTUR
PKENT	AVTUR	TEKTU	TEKTU
TEKTU	TEKTU	PKENT	PKENT
AYCES	AYCES	AYCES	AYCES
MARTI	MARTI	MARTI	MARTI

Source: Authors' calculations

According to Table 11, the ranking of the companies according to their realized return on assets is as follows: MAALT, AVTUR, PKENT, TEKTU, AYCES, and MARTI. According to panel data analysis, this ranking is: MAALT, PKENT, AVTUR, TEKTU, AYCES, and MARTI. According to AHP, the ranking is MAALT, AVTUR, TEKTU, PKENT, AYCES, and MARTI. According to FAHP, the ranking is as follows: MAALT, AVTUR, TEKTU, PKENT, AYCES, and MARTI.

Table 12 Spearman's rank correlation

	Actual value	Regression estimation	AHP estimation	FAHP estimation
Actual value	1.000			
Regression estimation	0.486	1.000		
AHP estimation	0.886*	0.371	1.000	
FAHP estimation	0.943*	0.257	1.000*	1.000

*Correlation is significant at the 5% significance level.
Source: Authors' calculations

Looking at Table 12, Spearman's rank correlation analysis was applied to determine whether there is a relationship between the rankings made according to the estimated return on assets ratios based on actual value, panel data analysis, AHP and FAHP. As a result of the analysis, there was a significant relationship between the ranking made using the realized return on assets ratios and the rankings obtained according to AHP and FAHP, while no significant relationship was found in terms of the realized return on assets ratio between the rankings obtained by panel data analysis.

6. Conclusion

Many studies have been conducted to determine the relationship between working capital management and profitability. In most of these studies, panel data analysis method was used. In some studies (Gill et al., 2010; Sharma & Kumar, 2011; Vahid et al., 2012; Yıldız & Deniz, 2020; Islıcık & Çil Koçyiğit, 2021), the elements of working capital management were found to have a positive effect on profitability, while in others (Mohamad & Saad, 2010; Charitou et al., 2010; Ukaegbu, 2014; Korkmaz & Yaman, 2019; Akomeah & Frimpong, 2019; Nguyen et al., 2020; Erdogan & Turkmen, 2021), the elements of working capital management were found to have a negative effect on profitability. Considering the panel data analysis part of the study, it was determined that the ATR and WCTR variables had a positive effect on profitability, while the FLR variable had a negative effect on profitability. These results are in line with the results of studies in the literature. In addition, the study differs from the literature in terms of heuristic methods, AHP and FAHP, used in addition to panel data analysis. The weights of the ratios affecting return on assets were determined by the AHP and FAHP methods by taking the opinions of 19 academic members who are experts in the field of accounting and finance.

The three methods discussed gave different results for the return on assets ratio. According to these results, companies can be ranked from a high to a low return on assets. The ranking of the companies according to their realized return on assets is as follows: MAALT, AVTUR, PKENT, TEKTU, AYCES, and MARTI. The ranking of the companies according to the panel data analysis results is as follows: MAALT, PKENT, AVTUR, TEKTU, AYCES, and MARTI. The ranking of the companies according to their AHP estimated return on assets is as follows: MAALT, AVTUR, TEKTU, PKENT, AYCES, and MARTI, while their rankings according to return on assets estimated by FAHP is as follows: MAALT, AVTUR, TEKTU, PKENT, AYCES, and MARTI.

A significant correlation of 0.943 was found between the rankings of the companies according to their realized return on assets and the rankings made according to the AHP and FAHP estimations. According to the return on assets ratio of the companies, no significant relationship was found between the rankings obtained in line with the estimates made by panel data analysis and the rankings made considering the realized value.

Another important result of the study is the differentiation of the significance and coefficients of the variables affecting return on assets in the models created according to the methods. The asset turnover rate and the financial leverage ratio, which are included in the model as working capital management variables in many studies in the literature, are not the ratios directly related to working capital management. However, these ratios emerged as the variables that statistically significantly affected return on assets at the highest level in panel data analysis. Since asset profitability is in question, this is a perfectly normal result, especially in terms of the asset turnover ratio. However, including the said variables in the model as a working capital management variable in panel data analysis and making comments according to the emerging model may cause misinterpretation of the effects of real working capital variables on return on assets. As a matter of fact, when the model that emerged according to the AHP and FAHP methods was examined, the asset turnover rate and financial leverage ratio variables were determined as the ratios with the lowest effect on return on assets, as the elements of working capital management, in the weighting made according to the opinions of the experts. From this point of view, in the studies to be conducted to reveal the effect of working capital management variables on profitability with panel data analysis, it may be possible to obtain healthier results by not including the asset turnover rate and the financial leverage ratio or any other ratio that is not directly related to working capital management in the model. In addition, the strategy of each enterprise regarding working capital management may differ depending on the factors such as the sector, the field of activity, asset-liability structure, cost, supply, production time, sales, receivable policy and economic indicators of the country. A significant part of the studies on the subject in the literature have been carried out on businesses with a current asset weighted asset structure. This study revealed that working capital management has an effect on return on assets in businesses that mainly rely on fixed assets, such as tourism companies. Considering other factors affecting the working capital management strategy, studies can be conducted on businesses with different characteristics by using similar heuristic methods.

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DIMENSIONS OF ATTRACTIVENESS IN EMPLOYER BRANDING AND THE VALUE PROPOSITION FRAMEWORK FOR YOUNG EMPLOYEES

Abstract

Purpose: The aim of this paper is to expand the body of knowledge on employer branding by identifying the dimensions of employer attractiveness for Generation Z and to develop a framework for employee value creation in the specific context of Croatian culture.

Methodology: The research was conducted on a sample of 220 key informants using the scale developed by Berthon et al. (2005). Since the purpose of the paper was to identify the various dimensions of employer attractiveness as well as the key factors of attractiveness as the basis for value proposition underlying respondents' perception of employer attractiveness, exploratory factor analysis was applied to analyze the data, i.e. a total of 25 identified employer attractiveness variables. After performing factor analysis, the average rates of importance were measured using summated rating scales for variables of individual factors.

Results: The study identified six organizational attractiveness dimensions relevant to Generation Z. In addition, a value proposition framework was developed. The attractiveness dimensions encompass Organization's market orientation, Acceptance and good relationships with colleagues, Informal characteristics of the workplace, Potential of the workplace for gaining experience and career advancement, Salary and other material benefits, and Sense of belonging to the organization. The dimensions have changed compared to the original Berthon et al. (2005) scale. These differences can be attributed to the specific needs of young employees and to a specific culture and general current conditions.

Conclusion: In the "war for talent", especially for young employees who enter the labor market for the first time, marketing concepts can be a powerful weapon. In order to attract them, their needs and wants should be deeply understood. Based on the proposed value proposition framework and the identified organizational dimensions, a valuable employer brand can be developed and the possibilities to attract and engage employees can be increased.

Keywords: Employer branding, employee value proposition, young employees, talent acquisition, organizational attractiveness

1. Introduction

Intense global competition, rapid technological changes, uncertainty in the global market (due to the COVID pandemic and the Ukraine crisis), economic trends and innovation-based knowledge economy put pressure on companies worldwide. It becomes clear that people, i.e. employees, and their capabilities can make a difference and have a crucial impact on a firm's success.

In these settings, highly competent employees are empowered and can choose among different job offerings. Moreover, young employees are not loyal and are not willing to continue working for the same employer if another one offers them more value (in any sense) (Rodriguez et al., 2019; Deloitte, 2022).

On the other hand, firms that are aware of the importance of people try to offer them value and make themselves more attractive to potential employees and more stimulating for the current ones. Talent acquisition is a major challenge among businesses today. The often-quoted term "war for talent" is highly present in the market (Beechler & Woodward, 2009; Williams et al., 2022).

It is especially important for firms to attract young talents entering the labor market for the first time. To be recognized as a preferred employer, differentiate themselves from other employers and attract the best employees in the market, firms strive to develop an attractive employee value proposition and a strong employer brand. In order to develop a strong brand as an employer, the concept of employer branding should be understood and clarified. A similar and strongly connected term is employer attractiveness (i.e. organizational attractiveness). When branding principles are applied in human resource management, the process is called employer branding and at the core of the brand is an employee value proposition and the attractiveness factors.

Based on the identified attractiveness factors, firms can start building their own employer brand, and a valuable value proposition framework can help them in the process. A value proposition framework or employment offerings should be designed in line with employee value preferences so as to retain, attract and boost current and potential employees (Sengupta et al., 2015). However, putting these principles into practice becomes even more challenging knowing that the factors of attractiveness (i.e. attractiveness of an employer in the eyes of potential employees) and the work values are impacted by cultural settings (Sengupta et al., 2015).

To the best of the authors' knowledge, there is not enough research on young people entering the labor market nowadays and their preferences in terms of attractiveness factors and dimensions in the specific context of Croatian culture. Therefore, the purpose of this paper is to expand the body of knowledge on employer branding by identifying the dimensions of employer attractiveness and to develop a framework for employee value creation in the specific context of Croatian culture.

The current study shows which factors employers should focus on when they develop their employer branding strategies, especially in regard to young, fresh employees entering the labor market in Croatia.

The paper consists of six sections. After the Introduction, Section 2 presents the theoretical background, while Section 3 outlines the methodology. Section 4 and Section 5 are dedicated to the research results and the discussion, respectively. Section 6 presents the concluding remarks and research limitations, and provides guidance for future research.

2. Theoretical background

2.1 Human resources and marketing

Human resources are crucial for competitive advantage and are especially important for modern knowledge-intensive economies (Sivertzen et al., 2013; Berthon et al., 2005, in Sengupta et al., 2015).

On the other hand, thanks to modern technology, the workforce has the possibility of choosing their employers all over the world and at the same time, they (especially young employees) are prone to switch employers frequently (Hillebrandt & Ivens, 2013). These facts push and encourage organizations to apply new principles and new approaches with the aim to attract, retain and engage people.

More than five decades ago, theorists noticed that some marketing principles could be applied in the field of human resource practices. The application of marketing principles in the field of HRM started in the 1970s when the term internal marketing (IM) was coined and academics started arguing about this approach (Ahmed & Rafiq, 2006). It was seen as the missing part of marketing (Piercy & Morgan, 1991) and especially important in the predominantly service-oriented economies (Bansal et

al., 2001). Bansal et al. (2001) highlighted the direct relation between IM practices and a firm's financial success. Varey & Lewis (1999) argued about different approaches to the concept and its application, while Ahmed & Rafiq (2006), some of the most prominent theorists on the topic, proposed a theoretical and operational model in which all external marketing plan steps and marketing terms were projected in an internal environment, from internal research to internal segmentation, positioning (branding) and 7 Ps.

Although IM has never been fully accepted and implemented by practitioners, employer branding (EB), as one of the steps of the IM approach, has taken root in practice. The topic of EB is nowadays becoming prominent among scientists and among HRM and marketing practitioners. Basically, it is based on the application of branding principles in the field of HRM (Almacik & Almacik, 2012).

2.2 Employer branding

The concept of employer branding arose many years after the concept of internal marketing; more precisely, it was coined in 1996 by Ambler and Barrow (Almacik & Almacik, 2012). They (Ambler & Barrow, 1996) described employer branding as a whole package of psychological, functional and economic benefits provided by a specific employer.

Dell and Ainspan (2001) saw employer brand as the image of an organization created by its values, systems and behaviors, whose aim is to attract, motivate and retain current and potential employees. More precisely, its impact is twofold: it aims to engage and retain existing workers and, concurrently, to develop the image of a desirable place to work for potential employees. Priyadarshi (2011) saw it as the extension of the relationship marketing principles and Ong (2011) pointed out that brands are seen as the most important assets of a firm. According to Tuzunuer and Yuksel (2009), employer branding is the identity of the company as an employer and is used to involve employees in the organizational culture and strategy. Lloyd (2002, in Berthon et al., 2005) saw employer branding as the sum of company's efforts to communicate to all employees the desired message and image.

Authors argued about different positive outcomes of a strong employer brand (Berthon et al., 2005; Srivastava & Bhatnagar, 2010; Figurska & Matuska, 2013). Besides the previously mentioned benefits (engagement, attraction), firms with a strong employer brand can reduce the cost of employee acquisition, improve employee relations and increase employee retention (Berthon et al., 2005). Moreover, a strong brand facilitates recruitment, motivates, and enhances employee's self-esteem and commitment (Srivastava & Bhatnagar, 2010). Figurska & Matuska (2013) highlighted that external benefits of employer branding are faster and easier access to candidates, attraction of talents, better candidate matching, and more job applications. Ong (2011) highlighted that brand, as an important firm's asset, impacts profitability. Moreover, Bahri-Ammari (2022) showed that an employer brand positively influences job-seeker attitudes. Nevertheless, no impact was found of the employer brand on a job-seeker's intention to apply for a job.

2.3 Employee value proposition

When discussing EB, another important marketing topic arises – the value proposition. According to Backhaus & Tikoo (2004), employer branding is the process of employer brand development and the employer brand is the value proposition conveyed by the employer (in other words, values that an employee expects to receive from an employer). In fact, employer branding communicates an employer's unique value proposition (Srivastava & Bhatnagar, 2010). Arasanmi & Krisha (2019) stated that an employer value proposition can be a powerful strategy for managing employees as it represents a unique set of benefits employees receive in exchange for their services.

Firms strive to develop a unique value proposition and let employees (both existing and prospective) know about their value proposition. This process should be supported by the whole organization and it requires time (Pawar, 2016). The value proposition is the core of the employer brand message (Sengupta et al., 2015) and is affected by the organization's values, society, initiative, environment, talent, and reward programs (Pawar, 2015).

It should be emphasized that firms need to base their employee value proposition (EVP) on their strengths and existing values. Clearly, these strengths and values should be attractive to employees as well as distinctive. Therefore, in the process of employer branding, one of the first steps is to define the employer value proposition, and in order to do this an employer should know the common dimensions of the employer brand, i.e. the di-

mensions of attractiveness (Sengupta et al., 2015). Sengupta et al. (2015) pointed out the need for an employer to deeply understand the work value preferences of employees if the goal is to attract and engage existing and potential employees.

Backhaus and Ticko (2004) argued that potential employees, when choosing an employer, compare their own needs, wants and values to the organization's image, and if they fit well, the organization appears more attractive. Berthon et al. (2005) highlighted that the more attractive an employer is perceived, the stronger the organization's employer brand equity. However, it has proven to be difficult for organizations to retain quality employees due to global and intense competition for talents and a lack of satisfaction with provided EVPs (Arasanmi & Krisha, 2019).

2.4 Today's challenges for organizational attractiveness and Gen Z preferences

Tuzuner & Yuksel (2009) stated that the first step in the employer branding process is the employer attractiveness phase which is seen as a multidimensional concept.

Berthon et al. (2005) outlined the following five dimensions of employer attractiveness: interest value, social value, economic value, development value and application value. In their research, Tuzuner & Yuksel (2009) found two dimensions of attractiveness – "integrated employer branding" and "attractiveness". In their research in which they tested 25 items and dimensions of Berthon's questionnaire in Norwegian settings, Sivertzen et al. (2013) found five dimensions of employer attractiveness – innovation value (three items), psychological value (two items), social value (four items), economic value (two items), and application value (four items).

Almacik and Almacik (2012) highlighted six factors in the employer attractiveness construct – social value, market value, economic value, application value, cooperation value, and workplace environment. The factors identified by Almacik and Almacik (2012) differed from the ones discovered by Berthon et al. (2005), probably because of cultural differences, as they stated. Almacik and Almacik (2012) pointed out that respondents attributed the highest importance to social value (M = 4.46) of the potential employers when searching for employment. They attributed the least importance to market value (M = 3.82) of the prospective employers.

In their research that encompassed practitioners and academics, Huang and Lee (2017) highlighted five dimensions of EB: economic value, development value, reputation value, social value and work-life value. The three highest-ranked components (by both industry and academic experts) were economic value, development value and reputation value. Social value (one of the often top-rated dimensions) was not seen as one of the most important factors. According to the Randstad Global Report (2013, in Figurska & Matuska, 2013), job security is the most important attractiveness factor of an employer, followed by salary, employer's financial health, working atmosphere, job content, and so on. Kashiva et al. (2019) analyzed Glassdoor, an employer branding platform, and highlighted different employer value proposition components such as social, interest, development and economic value (as stated by Berthon et al., 2005), work-life balance, management and brand value. Social value emerged as the most important factor, followed by interest value and work-life balance.

Nowadays, the world is facing global challenges such as the COVID-19 pandemic, which affects all aspects of people's lives and damages businesses.

Nelke (2021) stated that the COVID crisis disrupted the world of work due to remote work practices and accelerated digitalization, which requires new leadership tactics, special individual approach for workers, and adjustments of employer branding aspects. Nelke (2021) emphasized the need to adapt employer branding to online channels (an EB strategy should include offline and online tools) and to remote work. The process should be digitalized and the entire EB communication should be tailored in accordance to the new needs of target groups (Nelke, 2021). Nelke (2021) highlighted that specificity and challenges of the recent years have resulted in higher staff turnover, more absenteeism and lower productivity of employees.

Moreover, the COVID-19 pandemic has given rise to a totally new situation and unexpected challenges and it affects all organizational aspects, but ever since it broke out, it has been a special challenge for people, i.e. workers within organizations. In their study conducted in the pandemic era, Ta'Amnha et al. (2021) highlighted organizational support (like providing protection tools, easy access to tests, sharing information and conducting awareness workshops) as the key EB dimension in this specific period. Social support (such as colleagueship, cov-

ering for absent colleagues) was also found as the key EB determinant, and technical support (e.g. telecommuting training) was important as well. Srednoselec et al. (2021) conducted research on a small sample of Croatian Gen Zers and identified three attractiveness factors, namely job content attractiveness, material working conditions and freedom in job performance.

Despite all the specifics of the moment, one of the main goals for firms remains to attract and engage young talented employees who are entering the labor market.

Khanolkar (2014) showed in his research that Gen Zers appreciate organizations with modern adventurous outlook, want their employer to be supportive and trustworthy, and the workplace should be perceived as stylish and prestigious. In their study among Taiwanese undergraduate students, Li et al. (2018) pointed out that an employer brand consists of five dimensions and twenty-eight factors. The dimensions are affection and atmosphere, management and operations, salary and benefits, foreign company, interest and environment. In their study among students, Rampl and Kenning (2012) highlighted that an organization should be branded as sincere, exciting and sophisticated.

Despite the fact that there are a number of research studies focused on employer branding and employer (i.e. organizational) attractiveness (Ong, 2011; Priyadarshi, 2011; Almacik & Almacik, 2012; Bahri-Ammari et al., 2022), and a lot of research was carried out with the aim of identifying the dimensions of employer attractiveness (Berthon et al., 2005; Roy, 2008; Tuzuner & Yuksel, 2009), today employer branding is becoming a matter of prestige among businesses (for example, a number of best employer competitions are organized) and it is seen as a valuable asset for firms. However, as highlighted by Sengupta et al. (2015), work value preferences vary across countries and cultures. Therefore, it is interesting and useful to research the specificity of attractiveness within Croatian culture and among young employees who are entering the labor market for the first time.

3. Methodology

The research was conducted on a sample of 220 key informants. Key informants encompassed students of applied economics and business economics who attended the Faculty of Economics and Tourism "Dr. Mijo Mirković" in Pula. In order to assess the dimensions of employer attractiveness and develop a framework for employee value creation in the context of Croatian culture, the scale of Berthon et al. (2005) was used. The scale consists of 25 items and 5 dimensions (i.e. interest value, social value, economic value, development value and application value). Questions regarding the socio-demographic status of the respondents were added to the original scale. An electronic questionnaire was distributed to graduate and undergraduate students and was carried out in April 2021. Respondents were asked to rate all statements using the 7-point Likert scale (from 1 - strongly disagree to 7 - strongly agree).

The sample consisted of 28% male and 72% female respondents. About 42% of respondents were Marketing Management students, 19.7% Finance and Accounting students, 15% Management and Entrepreneurship students, and 12.4% of respondents were Tourism and Tourism & Development students. The sample was composed of 18.8% first-year undergraduate students, 7.7% second-year undergraduate students, 23.8% third-year undergraduate students, 34.9% first-year graduate students, and 14.7% second (last) year graduate students.

4. Research results

Since the purpose of the paper was to identify the various dimensions of employer attractiveness as well as the key factors of attractiveness as the basis for a value proposition underlying respondents' perception of employer attractiveness, exploratory factor analysis was applied to analyze the data, i.e. a total of 25 identified employer attractiveness variables. Due to low communality (< 0.5), two variables were excluded from data analysis, namely "Recognition/appreciation from management" and "Hands-on inter-departmental experience". The exploratory factor analysis results of the remaining 23 employer attractiveness variables are shown in Table 1. As the goal of the analysis was to identify the key factors of attractiveness, the p*rincipal component extraction method* was used in the application of exploratory factor analysis and the table shows the results after applying the Varimax rotation to facilitate the interpretation of results. The Kaiser-Meyer-Olkin measure of sampling adequacy value was 0.864, i.e. greater than the cut-off value of 0.5, indicative of sample adequacy for factor analysis. The adequacy of exploratory factor analysis of the

observed variables was further confirmed by Bartlett's test of sphericity, which was 2527.15 and statistically significant at the 5% level of significance. As a result of factor analysis, a total of six factors were derived whose own values were greater than 1, and together they explained 67% of the total variance of all variables.

Table 1 Results of exploratory factor analysis

Item	ID	F1	F2	F3	F4	F5	F6
A fun working environment	FA2	0.12	0.20	**0.79**	0.12	0.03	0.14
A springboard for future employment	FA3	0.10	0.24	0.15	**0.71**	0.23	0.15
Feeling good about yourself as a result of working for a particular organization	FA4	0.17	0.11	0.49	0.11	0.08	**0.66**
Feeling more self-confident as a result of working for a particular organization	FA5	0.09	0.09	0.06	0.22	0.17	**0.81**
Gaining career-enhancing experience	FA6	0.10	0.17	0.13	**0.75**	-0.05	0.29
Having a good relationship with your superiors	FA7	0.17	**0.61**	0.21	0.04	-0.02	0.41
Having a good relationship with your colleagues	FA8	0.14	**0.65**	0.48	0.11	-0.07	0.14
Supportive and encouraging colleagues	FA9	0.19	**0.60**	0.48	0.07	0.01	0.13
Working in an exciting environment	FA10	0.31	0.16	**0.53**	0.39	0.15	0.21
Innovative employer – novel work practices/ forward-thinking	FA11	0.49	0.07	0.34	0.28	0.30	0.05
The organization both values and makes use of your creativity	FA12	0.38	0.07	0.42	0.37	0.27	0.10
The organization produces high-quality products and services	FA13	**0.76**	0.12	0.17	0.15	0.20	0.07
The organization produces innovative products and services	FA14	**0.83**	0.07	0.15	0.16	0.21	0.15
Good promotion opportunities within the organization	FA15	0.25	0.01	0.10	**0.70**	0.18	0.04
Humanitarian organization – gives back to society	FA16	**0.71**	0.04	0.27	0.06	-0.07	0.05
Opportunity to apply what was learned during education	FA17	**0.68**	0.29	0.14	0.05	-0.02	0.16
Opportunity to teach others what you have learned	FA18	**0.59**	0.46	0.08	0.23	0.04	0.10
Acceptance from coworkers and belonging to the organization	FA19	0.23	**0.73**	0.16	0.17	0.07	0.04
The organization is customer-oriented	FA20	**0.60**	0.38	0.08	0.09	0.13	0.07
Job security within the organization	FA21	0.14	**0.75**	0.08	0.16	0.22	0.09
Happy work environment	FA23	0.08	0.32	**0.75**	0.12	0.12	0.10
An above average basic salary	FA24	0.08	0.06	0.08	0.16	**0.89**	0.05
An attractive overall compensation package (basic salary plus commission plus holiday cash grant plus other benefits)	FA25	0.21	0.11	0.08	0.13	**0.86**	0.17
% of the variance explained before rotation		35.9	8.9	7.7	5.3	4.6	4.6
% of the variance explained after rotation		16.4	13.1	12.0	9.8	8.8	7.0

Source: Authors' calculations, n = 220

The first derived employer attractiveness factor explained 16.4% of the variance of all variables after rotation of the factors, and based on the factor loading value, it contained the following variables: "The organization produces innovative products and services" (0.83), "The organization produces high-quality products and services" (0.76), "Humanitarian organization – gives back to society" (0.71), "Opportunity to apply what was learned during education" (0.68) , "The organization is customer-oriented" (0.60), and "Opportunity to teach others what you have learned" (0.59). With regards to the content of the variables relating to relationships of the organization to the market, the society and the customer and to employees, the first derived factor which explains respondents' perceptions of employer attractiveness was named "Organization's market orientation".

The second derived factor contained the following variables: "Job security within the organization" (0.75), "Acceptance from coworkers and belonging to the organization" (0.73), "Having a good relationship with your colleagues" (0.65), "Having a good relationship with your superiors" (0.61), and "Supportive and encouraging colleagues" (0.60). The second factor explained 13.1% of the variance of all variables after rotation, and given the content of more relevant variables relating to the work environment, it was named "Acceptance and good relationships with colleagues".

The third factor explained 7.7% of the total variance of all variables after rotation and contained the following variables: "A fun working environment" (0.79), "Happy work environment" (0.75) and "Working in an exciting environment". The third factor contained the variables relating to fun and a sense of satisfaction and excitement in the workplace, hence it was named "Informal characteristics of the workplace".

The fourth derived factor contained the following variables: "Gaining career-enhancing experience" (0.75), "A springboard for future employment" (0.71) and "Good promotion opportunities within the organization" (0.70). The derived factor explained 9.8% of the total variance of all variables after rotation and as it refers to individual promotion opportunities within the organization, it was named "Potential of the workplace for gaining experience and career advancement".

The fifth derived factor explained 8.8% of the total variance of all variables after rotation and contained the following variables: "An above average basic salary" (0.89) and "An attractive overall compensation package (basic salary plus commission plus holiday cash grant plus other benefits)" (0.86). This attractiveness factor was related to the financial aspects of the job, hence it was named "Salary and other material benefits".

Finally, the sixth derived factor explained 7% of the total variance of all variables and contained the variables "Feeling more self-confident as a result of working for a particular organization" (0.81) and "Feeling good about yourself as a result of working for a particular organization" (0.66). This factor was named "Sense of belonging to the organization".

After conducting factor analysis, the average rates of importance were measured using summated rating scales for variables of individual factors. The results are shown in Table 2.

Table 2 Average rating of the importance of individual factors of attractiveness

Factors of attractiveness	Mean rate	St. dev.
Organization's market orientation	5.48	0.06
Acceptance and good relationships with colleagues	6.16	0.05
Informal characteristics of the workplace	6.10	0.06
Potential of the workplace for gaining experience and career advancement	6.35	0.04
Salary and other material benefits	6.02	0.06
Sense of belonging to the organization	6.06	0.05

Source: Authors' calculations

Based on the calculated average values, it may be established that "Potential of the workplace for gaining experience and career advancement" (average rating = 6.35) and "Acceptance and good relationships with colleagues" (6.16) were perceived by the respondents as the most important employer attractiveness factors. On the other hand, the respondents rated as less important the attractiveness factors relating to material working conditions such as salary and other benefits (6.02). Finally, the least important factor of attractiveness concerned the organization's market activities (5.48), even though other employer attractiveness factors such as career advancement opportunities, excitement in the workplace, gaining new knowledge and experience, etc. may depend on organizational competitiveness in the organization's field of interest.

Based on the above-mentioned results, the authors developed a value proposition framework for young employees in the specific context of Croatian cultural settings, because a value proposition is the backbone of employer branding (Figure 1).

Figure 1 Value proposition model

Source: Authors

The results of the survey provide some basis for future research, but also some recommendations for organizational management to increase their attractiveness as an employer. These recommendations will be outlined in more detail in the next section.

5. Discussion

People are the key, not technology or processes. Accordingly, the war for talent is spreading among organizations in today's economy. In this "war", companies are making an effort to apply all the available tools and knowledge. A market-

ing approach appears to be the first to consider if an organization wants to attract people (roughly said – sell the product/job). At the core of the marketing approach is the effort to affect people's behavior without forcing it, or in other words, to impact people's behavior by satisfying their needs and wants. Bearing that in mind, internal marketing was to be used first (as the application of the marketing approach to employees in order to influence their values, attitudes and behavior), but it has never been fully accepted. However, it represented fertile ground for a new approach named employer branding. In order to start the employer branding process, organizations need to know what attracts and engages people (i.e. current and potential employees). Once that is clarified, an employer can define a clear and useful employee value proposition (EVP), the one that would attract the best talents (or at least increase the chances of attracting them), but also engage current employees (if properly applied in practice).

From an organization's standpoint, it is of the utmost importance to attract young employees (or even better, young talents) whose knowledge, skills and fresh insights drive innovation and, in the long run, competitive advantage. Therefore, it is really important to find out which factors attract them.

Moreover, it has been proven that cultural settings impact people's (in this case, employees') preferences. In the current research, attractiveness dimensions were found in the specific context of Croatian culture and among young people who will soon enter the labor market in large numbers. Furthermore, a related value proposition was proposed in the current economic, global and cultural settings.

The study discovered the following six dimensions: Organization's market orientation, Acceptance and good relationships with colleagues, Informal characteristics of the workplace, Potential of the workplace for gaining experience and career advancement, Salary and other material benefits, and Sense of belonging to the organization. There are partial similarities between the above dimensions and the Berthon et al. (2005) dimensions: economic value can be associated with Salary and other material benefits, development value with Potential of the workplace for gaining experience and career advancement, while social value can be associated with Sense of belonging to the organization. Similarities can also be found with research conducted by Sivertzen et al. (2013) with respect to social value (Sense of belonging to the organization) and economic value (Salary and other material benefits), and Almacik and Almacik (2012) with respect to social value, economic value and even market value (Organization's market orientation). There are also similarities with the Li et al. (2018) study among Taiwanese undergraduate students, i.e. the dimensions Affection and Atmosphere can be aligned with Informal characteristics of the workplace and Acceptance and good relationships with colleagues, and the dimension Salary and benefits is the same as the dimension Salary and other material benefits.

In conclusion, there are many similarities between different studies in different settings, but altered dimensions, especially if compared to the original Berthon et al.'s (2005) scale, are probably the result of cultural differences and specific current conditions (insecurity, economic trends, youth's preferences and needs).

Based on research results, HR managers and CEOs together can create an attractive value proposition, especially if they focus on Croatian young employees. The study highlighted the dimensions of organizational attractiveness and also pointed out and ranked their importance for Gen Z employees who are entering the labor market. A well-communicated, engaging employee value proposition can help companies to win the "war for talent", or at least a battle if not the war.

6. Conclusion, limitations and future research

Economies all over the world suffer from labor shortages. On the other hand, in the knowledge-based economy people are crucial. In these settings, new approaches are adopted and concepts like employer branding, organizational attractiveness and employee value proposition are becoming even more important. Accordingly, it has become important to study all aspects that can contribute to the improvement of their application. The current study pointed out new insights. It altered the previously proposed employer branding dimensions and the respective items and proposed a framework for an employee value proposition. Moreover, the current study pointed out the dimensions that are relevant to today's Gen Zers in Croatia. As stated before, cultures and current circumstances can impact young people's preferences. Still, there are lots of similarities between the current study and previous research, especially the ones conducted on

the same generation. The current study will facilitate the creation of an appropriate employee value proposition for the companies which are oriented towards young talents, especially if they operate in Croatia.

This study has some limitations, such as the structure of the sample and the focus on Croatian Gen Zers. The sample encompasses only students of the Faculty of Economics. In future research, the sample should include young people not attending university and students from other universities and fields of study as well (not only economics). Moreover, to get a complete picture among Gen Zers, future studies should include in the sample young people from other countries. Finally, it would be really useful to conduct research in other countries in order to compare the results and come to a conclusion about the impact of culture and other influences.

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CHARACTERISTICS OF WOMEN AND MEN ENTREPRENEURS ACCORDING TO THE STUDENT POPULATION IN CROATIA

Abstract

Purpose: The aim of this paper is to determine which characteristics the student population, especially student rural population, perceives as typical of women and men entrepreneurs, respectively, their grouping into latent factors, and the identification of possible differences in attitudes of respondents with regard to their demographic variables.

Methodology: An indicative survey was conducted on a sample of 1,157 respondents of the student population in Croatia by a questionnaire as a research tool. Descriptive statistical data analysis, inferential statistics, simple analysis of variance (one-way ANOVA) and exploratory factor analysis were used in the research.

Results: The results show that there are differences in attitudes towards the characteristics of women entrepreneurs and men entrepreneurs, with particular emphasis on differences in the perception of women's entrepreneurship in rural areas.

Conclusion: Positive trends in thinking about women's entrepreneurship in rural areas are very interesting and promising, which may eventually result in a reduction in the women's unemployment rate in rural areas and in valuing women as capable entrepreneurs.

Keywords: Entrepreneurial characteristics, women's entrepreneurship, student population, Croatia

1. Introduction

The area of entrepreneurship is most commonly associated with the male population, while women are less represented in entrepreneurial activity. Trying to achieve a balance between men and women has led to a partial change in people's awareness and strengthening of the role of women in economic growth and development, which is particularly evident in Asia, in countries such as Indonesia and Kazakhstan, but also in Angola and Togo, the best representatives of Africa (Global Entrepreneurship Monitor, 2021).

It is an indisputable fact that the situation in the last ten years has gotten better, but the potential of

women or women's entrepreneurship is still not sufficiently utilised, although the presence of women in entrepreneurship and management is very important and closely related to achieving positive economic results (Martín-Ugedo & Minguez-Vera, 2014). There are also contradicting opinions that women's and men's entrepreneurship should not be discussed since entrepreneurship is a concept that involves both genders, but because of the many obstacles women entrepreneurs encounter when initiating an entrepreneurial venture, women's entrepreneurship should and must be discussed even more.

The position of women today is more favourable than it was in the past when women had to conform to the traditionally accepted norms characteristic of women, that is, the traditional roles of mother, wife and housewife. The struggle for gender equality, equal opportunities in education, employment and earnings has indirectly resulted in a slight increase in the number of women entrepreneurs and self-actualisation of women, and also in the creation of a double image of success achieved in family and professional life (Díaz García & Welter, 2011), which is often not an easy task.

From all of the above, the aim of this paper is (i) to determine which characteristics the student population, especially the student rural population, perceives as typical of women and men entrepreneurs, respectively; (ii) their grouping into latent factors; and (iii) the identification of possible differences in attitudes of respondents with regard to their demographic variables.

2. Theoretical background

For years, and especially in rural areas, women have been characterised by a lower employment rate, longer job waiting time, and hence employment, although most of them are of working age (Carter & Marlow, 2007). A good, and sometimes the only way, out of the vicious circle of unemployment is self-employment of women by starting their own business in the area of small business entrepreneurship (Kristić et al., 2016).

The initiation of entrepreneurial activities should be related to equal opportunities and valorisation of entrepreneurial activities of women and men. This equality in the Republic of Croatia has not yet been achieved, which is especially evident by comparing the index of entrepreneurially active men and women per one hundred adult inhabitants (Kristić et al., 2018).

Since 2002, the Republic of Croatia has been included in the GEM (Global Entrepreneurship Monitor) program, which keeps track of changes in women's entrepreneurial activity using comparative analyses with other European countries and the world. In terms of starting entrepreneurial activity in the Republic of Croatia in 2020, women were almost two times less active than men (Global Entrepreneurship Monitor, 2020), which is a better result if we consider that in 2005 this difference was 3.78. In the categories of employment and total income, in 2017, women entrepreneurs in Croatia participated with 4.4% in total income and with 8.2% in total employment (Vrdoljak Raguž, 2020). The results of a survey conducted in 2015 place Croatia in the group of countries that favour the development of women's entrepreneurship. Croatian women entrepreneurs are mostly solo entrepreneurs (79%), and only 21% employ additional workers (Zirdum & Cvitanović, 2017).

Difficulties in accessing funding resources, insufficient support from institutions and inadequate legislation to strengthen gender equality, the traditional role of women in society, lack of educational programs and training programs, but also general dissatisfaction with financial opportunities (Fosić et al., 2017), encourage women's entry into self-employment, unfortunately, very often due to extreme necessity, which is particularly characteristic of rural areas where agricultural production is the dominant economic activity and the process of depopulation and feminisation of the village is a common occurrence (Kristić & Deže, 2011). In the Republic of Croatia, in the category of starting their business out of necessity, women entrepreneurs are ahead of men, i.e. 50% of women compared to 26% of men (Global Entrepreneurship Monitor, 2017) move into entrepreneurial activities for one reason only, and that is survival. The necessity motivator has often a bigger impact than the opportunity motivator. It is precisely rural women who are most often found in a kind of interspace between the neo-liberal paradigm and conservatism, i.e. there is a conflict between the desire to create self-sustainability through self-employment and entrepreneurial activity on the one hand, and to care for the farm and family on the other (Altan-Olcay, 2014). We can say that rural women entrepreneurs are a very important link in the socio-economic process, economic growth and sustainability, since they bring change not only to themselves but also to their community. Their empowerment represents the potential of social entrepreneurship in agriculture (Gramm et al., 2020). They are the key drivers of sustainable development, as they manifest greater social and environmental commitment and often tend to value

social and qualitative aspects more than economic ones, pursuing a balance between economic and non-economic objectives (Stefan et al., 2021).

The aforementioned reasons for less entrepreneurial activity of women in relation to men in the Republic of Croatia are very clear and evident, but the real question is whether there are differences between the characteristics of men entrepreneurs and women entrepreneurs and whether they are also responsible for the tendencies of entrepreneurial behavior. Although at first glance the characteristics of men entrepreneurs and women entrepreneurs do not exist, i.e. there should be no significant differences (Gundry et al., 2002; Rada-Florina et al., 2009), various studies have shown that there are indeed characteristics that are very much present in women and men entrepreneurs distinctively (Wagner, 2004; Gentry et al., 2010; Munshi et al., 2011).

3. Methodology

The survey used the method of collecting primary data by a questionnaire as a research tool. The questionnaire consisted of 23 closed-type questions divided into several groups related to the characteristics of women entrepreneurs and men entrepreneurs, obstacles to entrepreneurial activity, the reasons for launching an entrepreneurial venture and attitudes of respondents towards women and men in their entrepreneurial activities. The last group of questions refers to sociodemographic characteristics of respondents. The list of men entrepreneurial/women entrepreneurial characteristics has been elaborated according to Miner's questionnaire (1997), which defined the key entrepreneurial traits needed to achieve entrepreneurial success. Due to the wide scope of research, only the parts related to the attitudes of the respondents towards particular characteristics of women entrepreneurs and men entrepreneurs are presented in this paper.

The target group of the respondents were undergraduate and graduate students uniformly distributed on all constituent units of Josip Juraj Strossmayer University of Osijek. The questionnaire was filled out by 1,157 respondents, making the response rate 6.07%, which is relevant for this type of research (Meler, 2005). Students were selected as the target group of young people because they represent the future strength in the design of innovation and the development of entrepreneurial competencies that often lead to the creation of successful start-ups.

Of the total number of respondents (Table 1), 63.2% were women and 36.8% were men, corresponding to the data of the total population (59.2% women, 40.8% men). Similar sample and population data are also found in the scientific field of study, which is another argument that contributes to the representativeness of the sample.

Table 1 Students in the sample and population

Demographics		Sample	Population*
Gender	Women	63.2	59.2
	Men	36.8	40.8
The area they come from	Urban	47.3	N/A
	Suburban	14.1	N/A
	Rural	38.6	N/A
Monthly household income	< $530	13.1	N/A
	$530 - $730	18.6	N/A
	$731 - $1,066	19.0	N/A
	$1,067 - $1,400	13.0	N/A
	> $1,400	14.5	N/A
	No answer	21.8	N/A
Scientific field of study	Natural Sciences	8.1	5.3
	Biomedicine and Health Care	5.9	5.4
	Biotechnical Sciences	14.8	12.3
	Social Sciences	44.1	45.3
	Humanities	12.5	9.1
	Technical Sciences	14.6	22.6

Note: N/A = not available; * = Josip Juraj Strossmayer University of Osijek.
Source: Authors' research

The data collected in the study were processed by the SPSS Statistics 17.0 desktop statistical software package, while descriptive statistical data analysis methods like frequency, standard deviation, percentages and arithmetic mean were used in the research to describe the sample. Inferential statistics were also used to determine the probability that the conclusions based on the data are reliable. Of the parametric tests, simple analysis of variance (one-way ANOVA) was conducted to determine the differences in individual attitudes among the respondents (Fosić et al., 2017; Nandamuri & Gowthami, 2013).

Exploratory factor analysis was used to identify a smaller number of latent factors explaining the interconnection between the items of the subscale "Characteristics of Women Entrepreneurs" and "Characteristics of Men Entrepreneurs", and since the assumption was that the characteristics of women and men entrepreneurs correlate with each other, oblimin rotation was used. For the purpose of testing data adequacy for factor analysis, Bartlett's test of sphericity and the Keiser-Meyer-Olkin (KMO) test measuring sampling adequacy were conducted.

4. Results and discussion

In order to examine the differences in the student population's perception of the characteristics of men and women entrepreneurs, they were asked a question about the entrepreneurial traits of men and women entrepreneurs, respectively, in which they expressed their attitudes using the Likert five-point scale. To determine the categories of responses to individual characteristics, the arithmetic mean (M) and standard deviation (SD) were calculated using the descriptive statistics methods, as presented in Table 2.

Table 2 Respondents' attitudes towards the characteristics of women entrepreneurs and men entrepreneurs

	Women		Men	
	M	**SD**	**M**	**SD**
empathy	3.78	0.998	2.60	0.885
conflict	3.42	1.011	3.58	0.922
good organisation	4.21	0.847	3.66	0.869
initiative	3.70	0.927	3.89	0.834
self-confidence	3.72	0.924	4.23	0.786
intuition	4.05	0.926	3.38	0.936
stability	3.53	0.960	3.89	0.860
risk-taking	3.37	0.985	4.13	0.845
higher education	4.14	0.951	4.00	0.922
financial stability	3.73	0.918	3.99	0.863
experience	3.56	0.962	3.89	0.896
patience	3.85	1.046	3.28	0.972
thoughtfulness	3.69	0.954	3.63	0.923
diligence	4.21	0.856	3.66	0.906
respect for other people's opinions	3.77	1.023	3.30	0.904
teamwork	3.91	0.926	3.72	0.914
communication skills	4.21	0.845	3.80	0.898
youth	3.55	1.091	3.43	1.014
leadership	3.61	1.033	4.15	0.964
resistance to change	3.18	1.073	3.40	1.073
control	3.73	0.949	3.79	0.932
creativity	4.24	0.875	3.51	0.938
generosity	3.59	1.034	3.27	0.913
loyalty	3.61	0.931	3.45	0.868
independence	3.62	0.966	3.93	0.925
ambition	4.20	0.859	4.12	0.833
optimism	3.93	0.988	3.85	0.912

Note: N = 1157 respondents, the range of answers 1-5, SD = standard deviation.
Source: Authors' research

In order to determine which characteristics are more closely related to women and men entrepreneurs, respectively, the responses "matches the description" and "strongly matches the description" (points 4 and 5 on a five-point scale) were taken into account. The common characteristics of women entrepreneurs and men entrepreneurs are those for which the respondents' answers do not differ by more than 10%, while the characteristics for which differences are greater than 10% are attributed either to women entrepreneurs or to men entrepreneurs. The interpretation of the results excluded the resistance to change characteristic, because according to the respondents' answers, this characteristic corresponds to a large extent to neither women entrepreneurs (61.8%) nor men entrepreneurs (52.8%).

Characteristics that respondents believe are more related to women entrepreneurs are good organisation (84.7% for women, 61.1% for men), intuition (73.3% vs. 44.4%), diligence (82.0% vs. 59.1%), communication skills (81.2% vs. 63.5%), creativity (81.3% vs. 50.6%), empathy (69.4% vs. 10.6%), patience (66.7% vs. 39.3%), respect for other people's opinions (64.4% vs. 40.6%), generosity (54.0% vs. 38.6%), and loyalty (56.4% vs. 47.8%).

Characteristics of self-confidence (83.7% for men, 62.1% for women), risk-taking (78.7% vs. 45.1%), stability (69.3% vs. 53.0%), financial stability (73.6% vs. 62.6%), experience (69.4% vs. 55.6%), independence (69.3% vs. 57.2%), and leadership (78.4% vs. 56.5%) are more related to men entrepreneurs, which corresponds to Mirchandani's (1999) research, which relates characteristics such as independence, competitiveness, self-confidence (Rada-Florina et al., 2009), and risk-taking (Carter & Marlow, 2007; Watson & Newby, 2007) exclusively to men entrepreneurs. Women more frequently perceive the situation as risky but also exhibit less risky entrepreneurial behaviour (Wagner, 2004).

Some of the characteristics such as youth (50.4% for women, 45.9% for men), where entrepreneurs are expected to have entered their thirties and forties (Carter & Marlow, 2007; Dodescu et al., 2011; Gelo et al., 2011; Botric, 2012), conflict (46.2% vs. 54.5%), initiative (60.7% vs. 69.2%), higher education (79.3% vs. 73.7%), thoughtfulness (60.2% vs. 58.4%), teamwork (70.1% vs. 60.2%), control (59.4% vs. 63.2%), ambition (81.7% vs. 78.0%), and optimism (67.8% vs. 66.0%) fall into the group of common traits, which, according to the student population, are characteristic of both women and men entrepreneurs. The list of characteristics of women entrepreneurs almost entirely corresponds to Jalbert's (2000) research, which has shown that women entrepreneurs are most likely to differ from men in communication skills, intuition, continuous work on their abilities and empathy. Creativity is a trait that is also explicitly attributed to women entrepreneurs in the research of Munshi et al. (2011) and Tan (2008). Women often believe that respect, respect for other people's opinions (Vuk & Krolo Crvelin, 2006), equality and patience are much more useful in communication, thus they are less prone to conflicts (Gentry et al., 2010), while men accept entrepreneurial risk more often and faster (Akehurst et al., 2012).

Table 3 Testing the differences between the arithmetic means for characteristics of women entrepreneurs related to the area

	Where are you from?							
	Urban		Suburban		Rural			
Characteristics	M	SD	M	SD	M	SD	F-ratio	p
conflict	3.51[a]	0.956	3.35[b]	1.063	3.32[a]	1.048	4.770	0.009 **
good organisation	4.16[a]	0.868	4.14[b]	0.922	4.29[a]	0.786	3.457	0.032 *
initiative	3.65[a]	0.936	3.60[b]	0.959	3.81[a]	0.896	4.603	0.010*
self-confidence	3.70[b]	0.914	3.57[a]	1.006	3.78[a]	0.901	3.253	0.039*
stability	3.45[a]	0.974	3.48[b]	1.008	3.64[a]	0.915	4.900	0.008**
risk-taking	3.24[a]	0.949	3.45[b]	0.995	3.49[a]	1.006	8.602	0.000**
financial stability	3.72[b]	0.884	3.58[a]	0.967	3.81[a]	0.934	3.761	0.024*
teamwork	3.79[a]	0.940	3.94[b]	0.858	4.04[a]	0.916	9.254	0.000**
creativity	4.18[a]	0.889	4.18[b]	0.911	4.34[a]	0.836	4.516	0.011*
generosity	3.59[b]	1.026	3.42[a]	1.070	3.67[a]	1.025	3.590	0.028*

Note: To determine the difference between the arithmetic means of the statements related to the category of the area, simple variant analysis - ANOVA, df = 2 was used. The table lists only the characteristics for which a statistically significant difference (ab* $p < 0.05$; **$p < 0.01$) has been established.
Source: Authors' research

Although higher education, as a common characteristic of both women and men entrepreneurs (Aidis et al., 2007), does not have to be related to the initiation of an entrepreneurial venture and entrepreneurial behaviour, it still reduces an individual's risk of falling into poverty and increases the number of opportunities for better paid jobs (Bárcena-Martín & Moro-Egido, 2013).

In order to determine whether there are differences in the attitudes of the respondents towards the statements on the aforementioned characteristics of women and men entrepreneurs, according to their socioeconomic and demographic traits (gender, area, household income, scientific field of study), simple variance analysis (ANOVA) was conducted. There are statistically significant differences in the estimation of the characteristics listed in Table 2 in the area category for the characteristics of women entrepreneurs, and they are listed in Table 3, while in the categories of gender, household income and the scientific field of study for women entrepreneurs and all four demographic traits for men entrepreneurs, there are no statistically significant differences, and for this reason, they have not been mentioned.

Compared with respondents coming from the city, respondents coming from rural areas attribute the following characteristics more to women entrepreneurs: good organisation ($F = 3.457$, $df = 2$, $p < 0.032$), initiative ($F = 4.603$, $df = 2$, $p < 0.010$), self-confidence ($F = 3.253$, $df = 2$, $p < 0.039$), stability ($F = 4.900$, $df = 2$, $p < 0.008$), risk-taking ($F = 8.602$, $df = 2$, $p < 0.000$), financial stability ($F = 3.761$, $df = 2$, $p < 0.024$), teamwork ($F = 9.254$, $df = 2$, $p < 0.000$), creativity ($F = 4.516$, $df = 2$, $p < 0.011$), and generosity ($F = 3.590$, $df = 2$, $p < 0.028$), while in the case of conflicts, the situation is reverse, i.e. those coming from urban areas compared to respondents coming from rural areas attribute this characteristic more to women entrepreneurs ($F = 4.770$, $df = 2$, $p < 0.009$). The absence of a statistically significant difference in responses between young women and men and greater valuing of certain characteristics of women entrepreneurs by young people from rural areas is surprising but very encouraging. Quite frequently, entrepreneurship is the only solution for hiring young people from rural areas through opening micro-enterprises (Sharma et al., 2012), which is particularly significant for the female population (Sidhu & Kaur, 2006).

After establishing the differences in characteristics typical of women and men entrepreneurs, it is necessary to extract relevant factors from a relatively large number of characteristics. Factor analysis was conducted by the main component (PC) method on the matrix of correlation between 25 parts of the subgroup "Characteristics of women entrepreneurs" (in the preliminary analysis, empathy and conflict parts were excluded), and since we assumed that the characteristics of women entrepreneurs correlate with each another, oblimin rotation was used. Bartlett's test of sphericity, which rejected the assumption that the correlation matrix was an identity one ($p < 0.01$), confirms that data are suitable for factorisation. The second check was done using the KMO measure. Our data provide a KMO value of 0.940, which means that 94% of covariates among variables are conditioned by common factors, while the other 6% are caused by correlated unicity, which is an excellent value (Fulgosi, 1988), so we can conclude that a more than satisfactory value on this criterion was achieved and that it is justified to carry out the process of factor analysis.

This criterion has extracted four significant factors, but it should be noted that the characteristic root of the fourth factor is 1.137, which is only slightly above the value of 1 which is taken as a limit of significance in this process. In order to facilitate the determination of the variables involved in the design of each factor, it is necessary to perform the rotation of the main components. After the rotation, a simpler structure is obtained, characterised by the fact that each factor is more strongly correlated with some variables and less strongly correlated with others (Table 4).

Table 4 The results of factor analysis and the corresponding coefficients for 25 extracted components of the characteristics of women entrepreneurs

	Factor analysis		
	Factor loading	**Eigenvalue**	**Variance explained (%)**
Factor 1: Work skills/characteristics		**8.423**	**33.694**
Stability	0.504		
Patience	0.678		
Thoughtfulness	0.517		
Diligence	0.661		
Respect for other people's opinions	0.743		
Teamwork	0.702		
Communication skills	0.569		
Creativity	0.628		
Generosity	0.698		
Loyalty	0.667		
Independence	0.520		
Optimism	0.655		
Factor 2: Characteristics of successful women Entrepreneurs		**1.534**	**6.137**
Higher education	0.638		
Financial stability	0.524		
Experience	0.668		
Youth	0.643		
Leadership	0.624		
Resistance to change	0.671		
Control	0.570		
Factor 3: Intrapsychic characteristics		**1.470**	**5.881**
Good organisation	0.551		
Initiative	0.681		
Self-esteem	0.731		
Intuition	0.494		
Risk-taking	0.632		
Ambition	0.595		

Source: Authors' research

The first factor explains 33.69% of variance, and the following variables were involved in its formation: stability, patience, thoughtfulness, diligence, respect for other people's opinions, teamwork, communication skills, creativity, generosity, loyalty, independence, and optimism. Taking into account the variables most strongly associated with the first factor, this factor can be called a factor of work skills/characteristics. The second factor explains 6.14% of variance, and is made up of the following variables: higher education, financial stability, experience, youth, leadership, resistance to change, and control. This factor is characterised by the characteristics of successful women entrepreneurs, and given the most strongly correlated variables, we can call it the factor of successful women entrepreneurs. The third factor explains 5.88% of variance, and it is determined by the particles organisation, initiative, self-confidence, intuition, risk-taking and ambition. All these variables refer to basic (innate) personality traits and can be called a factor of intrapsychic traits.

The same method of factor analysis was applied to the characteristics of men entrepreneurs. Bartlett's test of sphericity, which rejected the assumption that the correlation matrix was an identity one ($p < 0.01$), confirms that data are suitable for factorisation. The KMO value is 0.912, which means that 91.2% of the covariation among the variables is conditioned by common factors, while the other 8.8% is caused by correlated unicity, and again, a more than satisfactory value was achieved and the implementation of factor analysis is justified. This criterion extracted five significant factors, but the characteristic roots of the fourth and fifth factors are 1.211 and 1.122, respectively, so they did not enter the further analysis process. The percentage of the total variance explained by the first factor is 25.92%, while the second and third factors explain 8.6% and 5.2% of the total variance. In order to facilitate the determination of the variables involved in the design of each factor, it is necessary to perform the rotation of the main components. After the rotation, a simpler structure is obtained, characterised by the fact that each factor is more strongly correlated with some variables and less strongly correlated with others (Table 5).

Table 5 The results of factor analysis and the associated coefficients for 25 extracted components of the characteristics of men entrepreneurs

	Factor analysis		
	Factor loading	**Eigenvalue**	**Variance explained (%)**
Factor 1: Characteristics of successful entrepreneurs		**6.479**	**25.915**
Leadership	0.730		
Independence	0.680		
Experience	0.613		
Financial stability	0.606		
Higher education	0.603		
Control	0.550		
Ambition	0.519		
Resistance to change	0.493		
Conflict	0.450		
Factor 2: Work skills/characteristics		**2.151**	**8.604**
Respect for other people's opinions	0.693		
Generosity	0.630		
Patience	0.625		
Teamwork	0.577		
Loyalty	0.575		
Creativity	0.540		
Optimism	0.530		
Diligence	0.523		
Thoughtfulness	0.502		
Communication skills	0.491		
Factor 3: Intrapsychic characteristics		**1.290**	**5.161**
Initiative	0.661		
Good organisation	0.636		
Intuition	0.597		
Self-esteem	0.590		
Stability	0.544		
Risk-taking	0.521		

Source: Authors' research

The first factor projects nine manifest variables - leadership, independence, experience, financial stability, resistance to change, higher education, control, conflict, and ambition. This factor is characterised by the characteristics of successful entrepreneurs, so we can call it the factor of the characteristics of successful entrepreneurs. The second factor is determined by ten variables - respect for other people's opinions, generosity, patience, loyalty, teamwork, creativity, optimism, thoughtfulness, communication skills, and diligence. This factor is characterised by the traits essential to work and can be called the factor of work skills/characteristics. The third factor is determined by six variables - initiative, organisation, intuition, self-confidence, stability, and risk acceptance, and they relate to fundamental (innate) personality traits and can be called the factor of intrapsychic traits.

Factors for women and men entrepreneurs are very similar, but there are obvious differences. In terms of women, work skills variables include stability and independence variables, intrapsychic variables include ambition, and youth appears in the characteristics of successful women entrepreneurs. When it comes to men, there is a difference between intrapsychic traits in the stability variable, while in the characteristics of successful men entrepreneurs, there is a distinction among independence, conflict, and ambition variables.

Among women entrepreneurs, most of the variance is explained by the work skills factor, while the most strongly associated variables are team work, respect for other people's opinions, generosity, and patience. Among men entrepreneurs, most of the variation is explained by the characteristics of successful entrepreneur factor, and its construction is dominated by variables of leadership, independence, experience, and financial stability. Women prefer to select a sustainable business model rather than the traditional, profit-oriented model. They are focused not only on benefits but also on added value, quality, social and environment impact, while men entrepreneurs are traditionally focused on maximizing financial benefits that can be obtained (Fernandez et al., 2021).

After conducting factor analysis of the characteristics of women entrepreneurs and men entrepreneurs, and the division into three factors in women and three factors in men, ANOVA analysis of the obtained data was performed (Table 6). By conducting the analysis of variance, as a parametric statistical tool, we wanted to check whether the factors or characteristics of women and men entrepreneurs differ with regard to certain demographic variables. Again, in the categories of gender, household income and the scientific field of study, there are no statistically significant differences, so the results are not shown.

Table 6 Testing the difference between the arithmetic means of factors for the characteristics of women and men entrepreneurs with respect to the area

Characteristics	Where are you from?						F-ratio	p
	Urban		Suburban		Rural			
	M	SD	M	SD	M	SD		
Factor 1 (W)	3.810[a]	0.629	3.779[b]	0.630	3.917[a]	0.588	4.895	0.008**
Factor 2 (W)	3.660[a]	0.586	3.523[b]	0.695	3.666[a]	0.703	3.256	0.039*
Factor 3 (W)	3.845[a]	0.612	3.795[b]	0.660	3.939[a]	0.566	4.598	0.010*
Factor 1 (M)	3.900	0.504	3.803	0.632	3.865	0.579	2.009	0.135
Factor 2 (M)	3.530	0.541	3.529	0.521	3.574	0.567	0.889	0.411
Factor 3 (M)	3.858	0.511	3.843	0.591	3.877	0.555	0.275	0.760

Note: For the purpose of determining the difference between the arithmetic means of the claims with respect to the category of the area, simple analysis of variance - ANOVA (*p < 0.05; ** p < 0.01), df = 2 was used.
Source: Authors' research

Statistically significant differences exist again in the categories of responses provided by urban and rural populations. Those who come from rural areas attribute work skills more to women entrepreneurs (F = 4.895, df = 2, p < 0.008), the characteristics of successful women entrepreneurs to women entre-

preneurs ($F = 3.256$, $df = 2$, $p < 0.039$) and intrapsychic traits to women entrepreneurs ($F = 4.598$, $df = 2$, $p < 0.010$).

5. Conclusion

Although the characteristics of women entrepreneurs and men entrepreneurs are comparatively similar, the noted difference may lead to a completely different type of management. Empathy, organisation, intuition, patience, diligence, respect for other people's opinions, communication skills, creativity, generosity, and loyalty in women entrepreneurs, and self-confidence, stability, risk-taking, financial stability, experience, leadership, and independence in men entrepreneurs can lead to different ways of starting and running a business, achieving different strategic goals, different ways of negotiating, and a different view of economic performance of the business.

A similar situation is also observed with the extracted factors. The list of characteristics according to factors of work skills, traits of successful entrepreneurs and intrapsychic traits is quite similar, and there are basic differences in the stability, ambition, independence, and conflict variables. Stability is a variable that is attributed to men as an inherited trait, while for women it is a skill essential to work. Ambition is considered to be an intrapsychic trait in women, while in men, along with independence and conflict, it is a characteristic of a successful entrepreneur. If we look at the strength of the participation of some variables in the percentage of explanation of the variance of the above factors, women entrepreneurs and men entrepreneurs are distinguished by four different variables. For women, these are teamwork, respect for other people's opinions, generosity and patience, while for men, these are leadership, independence, experience and financial stability.

As this research was focused on a specific group according to age and education, which largely confirmed the views and results of research presented in the theoretical part, the research results are a useful foundation for conducting comprehensive research on the state level of the Republic of Croatia, with particular emphasis on active women entrepreneurs and men entrepreneurs.

It should be noted that so far, at least in the national context, empirical research on the characteristics of men and women entrepreneurs has not been conducted. The focus was mainly on theoretical views of women's entrepreneurship. This fact is the fundamental contribution of this paper. The previously mentioned lack of relevant research due to the impossibility of comparison with previous research is a limitation of this research. Another limitation of the research is the sample made up of the student population. It is indisputable that their attitudes and opinions are different from the attitudes of the population that does not have a university degree, so the results cannot be generalised to the entire population. They may also differ from the opinions of women and men entrepreneurs.

Future research should be based on the sample of women and men entrepreneurs in Croatia. There is also a need for continuous longitudinal research that would show trends in respondent perceptions. Qualitative research could also go deeper into the perception of respondents.

Support of local, regional and national government and policymakers through their coordinated and continuous activities is crucial. A properly set and applied policy is necessary for creating a long-term strategy for women's entrepreneurship, especially in rural areas, sensitizing the public about this topic, networking women entrepreneurs at the regional and national levels, creating financing programs for women entrepreneurs, providing support for family life and child care, and encouraging quality programs aimed at strengthening entrepreneurial activity in rural areas through counselling, training and mentoring.

The biggest surprise of the research is the absence of statistically significant differences with regard to gender and household income in attitudes towards characteristics, but also when comparing the extracted factors, i.e. the existence of a statistically significant difference in the category of the area. Positive trends in thinking about women' entrepreneurship in rural areas are very interesting and promising. Whether they a cornerstone that will ultimately enable a reduction in the women's unemployment rate in rural areas and thus put women in a better position and give them the opportunity to participate in overall economic growth and development remains to be seen. But most importantly, there exists the valuing of women as capable entrepreneurs with a combination of characteristic work skills, performance features and intrapsychic traits.

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GREEN BONDS AND CARBON EMISSIONS: THE EUROPEAN UNION CASE

Abstract

Purpose: The growing popularity of green bonds has sparked an ongoing debate about their real impact on the environment. The idea behind green bonds is that they provide environmental benefits, such as a reduction in carbon emissions, by financing environmentally friendly projects. The aim of this paper is to examine the relationship between green bond issuance and CO2 emissions in the EU-27 from 2013 to 2017 to determine the validity of this theory.

Methodology: Data on green Eurobonds issued in the EU-27 and CO2 emissions in the EU-27 were collected from 2013 to 2017 using the Refinitiv Eikon database. Descriptive statistics and linear correlation were used to investigate the association between green Eurobonds issued and CO2 emissions per capita in the EU-27.

Results: The study found that while green bond issuance increased dramatically, from EUR 5 billion in 2013 to EUR 75 billion in 2017, there was only a small decrease in total and per capita CO2 emissions of 3.7% and 4.6%, respectively. Moreover, no significant relationship was found between them.

Conclusions: The results suggest that while an increase in green bond issuance indicates a trend toward more sustainable investments, it does not necessarily lead to a proportional decrease in CO2 emissions. Therefore, further research is needed to better understand the association between green bond issuance and carbon emissions and to identify the underlying factors that may influence this relationship.

Keywords: Low-carbon economy, CO2 emissions, green bonds, green financing, greenwashing

1. Introduction

Greenhouse gases (GHGs) emitted from human activities are the primary cause of global warming (IPCC, 2018), with carbon dioxide (CO2) being the most significant contributor accounting for 74.4% of total emissions (Ritchie et al., 2022). In order to keep a global increase in temperature to 2°C above pre-industrial levels, the Paris Agreement (UNFCC, 2019) was signed in 2015. It aims to finance low-carbon and climate-resilient growth, which requires substantial environmentally responsible investments. One of the tools for financing climate resilience is through green bonds.

Green (climate) bonds are a financial mechanism that enables climate change alleviation and the transition to a low-carbon economy (Benlemlih et al.,

2022; Hung, 2021; Gianfrate & Peri, 2019). Green bonds can affect greenhouse gas (GHG) emissions at the company level through two main mechanisms; firstly, by funding projects that decrease emissions such as lower energy consumption or the development of cleaner products, and secondly, by encouraging firms to improve their environmental practices.

To this end, the development and adoption of green financial instruments have proven necessary to support the achievement of climate goals. Although the green bond market has developed in recent years (Climate Bond Initiative, 2022; Flammer, 2021; Cheong & Choi, 2020; Tolliver et al., 2019), especially after the endorsement of the Paris Agreement (UNFCC, 2015), it is not yet sufficient to finance all the needs for implementing environmental investments (Faure et al., 2020). Nonetheless, green bonds are emerging as a popular and even dominant form of financing green projects, particularly in China, the United States, and Europe (Statista, 2022), in addition to green loans and green equity (Flammer, 2021).

In 2021, more than $517 billion worth of green bonds were issued, a 50% increase from the previous year (Climate Bonds Initiative, 2022). Green bonds are no longer just attracting financial development institutions and public sector issuers, but also private sector and private issuers seeking financing for their green projects (Demary & Neligan, 2018; Weber & Saravade, 2019). Although green bonds were less widely accepted in the early days of green bond market development due to higher perceived risk compared to ordinary corporate bonds and were therefore higher-priced (Lütken, 2014), views on green bonds have changed today as green strategies and the green bond market have evolved. Their characteristics such as long maturity, low cost, acceptable risk due to policy support, and usually high issuer credit quality (Wang & Chu, 2022; Azhgaliyeva et al., 2020; Sachs et al., 2019a; Sachs et al., 2019b), make them attractive to both potential investors and issuers. Moreover, they represent a model that contributes to an intergenerational solution to a common problem by transferring some of the costs of green projects implemented today to the generations that will benefit from their implementation (Sartzetakis, 2021; Orlov et al., 2017; Flaherty et al., 2016; Gevorkyan et al., 2016).

Along with efforts to achieve the United Nations Sustainable Development Goals (SDGs) (United Nations, 2015) and the Paris Agreement (UNFCC, 2015) through various measures, including the development of financing mechanisms for low-carbon, climate-resilient global development, this financial instrument is acquiring an important role in financial markets. However, the question is whether and to what extent green benefits are associated with the increasing issuance of green financial instruments. Given the increasing importance of this issue, studies have been conducted on the role and contribution of green financial mechanisms in reaching the goals of the Paris Agreement, leading to different conclusions regarding a link between green financial instruments and CO2 emission reductions.

This paper aims to complement existing research on green finance by analysing the correlation between green bond issuance and CO2 emissions in the European Union, which is useful information for policy makers and energy policy analysts (Marín-Rodríguez et al., 2022). The study aims to establish the extent to which the rising issuance of green Eurobonds is related to actual environmental benefits. To the best of our knowledge, there are no studies that investigate this relationship in the context of green bonds issued by the EU member states. The literature on the environmental impact of green financial instruments, specifically green bonds, is limited and this study aims to fill this gap in the research. The study intends to provide insights into the effectiveness of green bonds as a tool for promoting sustainable development and reducing carbon emissions in the EU.

The paper is structured in the following way: following the introduction, the second section provides an overview of the association between the issuance of green bonds and carbon emissions and highlights key findings from previous studies. The third section details the sample and methods used. The fourth section presents the results of the study on the relation between green bonds and carbon emissions, and the final section concludes the paper.

2. Conceptual background with literature review

Research on the association between green bonds and carbon emissions has yielded varied results, with some studies suggesting a possible positive association between the two (Chang et al., 2022; Fatica & Panzica, 2021; Schmittmann & Chua, 2021; Shen et al., 2021; Tolliver et al., 2019), and others finding mixed or inconclusive results (Benlemlih et al., 2022; Kant, 2021; Ehlers et al., 2020). One theory is that green bond issuance could lead to a reduction in carbon emissions by financing projects that decrease emissions, such as renewable energy projects or energy efficiency projects. Additionally, green bond issuance could also incentivize firms to improve their environmental performance, which could lead to a reduction in carbon emissions.

Benlemlih et al. (2022) examined the association between green bond issuance and carbon emissions and environmental performance using a sample of 534 bonds issued by 213 companies and found mixed results from regression analysis, with no significant reduction in carbon emissions among green bond issuers, but a decrease in CO2 emissions over time. Meo & Abd Karim (2022) examined the association between green finance (using green bonds as a proxy) and carbon emissions using quantile-on-quantile regression (QQR) on a sample of countries leading in green finance in the period from November 2008 to June 2019 and found an overall negative impact of green finance on CO2 emissions, but this relationship varied at different quantiles. Shen et al. (2021) applied cross-sectionally augmented autoregressive distributed lags (CS-ARDL) using panel data of 30 provinces in China over the period 1995-2017 and found a negative association between green investment and carbon emissions. Sinha et al. (2021) studied the effects of green bond financing on environmental and social sustainability by analysing the S&P 500 Global Green Bond Index and the S&P 500 Environmental and Social Responsibility Index from October 2010 to July 2020, combining advanced quantile modelling methods. They discovered that this type of financing is starting to have a detrimental impact on environmental and social responsibility, though initially it had a positive impact. Fatica & Panzica (2021) investigated the relationship between green bond issuances and issuers' environmental performance of nonfinancial companies up to 2019 and found that green bond issuers have recorded a decrease in carbon emissions. Kant (2021) examined the relationship between green bonds and carbon emissions using a sample of 200 corporate green bonds from December 2015 to December 2019 and found no statistically significant association between analysed variables. Schmittmann & Chua (2021) examined carbon emissions intensity in 2019 for 148 green bond issuers in the S&P Global 1200 Index and found that these companies have lower carbon emissions in terms of revenue and assets than green bonds non-issuing companies. In addition, those companies have higher environmental rating scores.

Older studies such as Ehlers et al. (2020) examined carbon intensity of companies that issued green bonds and compared them to other companies. They found no clear evidence that green bond issuance is associated with a decrease in carbon intensity over time at the firm level. The study found that, on average, carbon intensity declined in the two years following green bond issuance, but later increased. Tolliver et al. (2019) examined the contribution of green bonds to the Sustainable Development Goals (SDGs) by examining the relationship between green bonds and GHG emissions. Using a sample of 53 green bond issues from 96 countries from 2008 to 2017, the authors found that projects financed with green bonds led to a reduction in GHG emissions of about 108 million metric tonnes of CO2 equivalent.

Green bond issuance intended to finance environmentally friendly projects can lead to "greenwashing" if companies use green bond issuance primarily to enhance their reputation without making significant changes to their environmental practices. Transparency in the disclosure of projects by green bond issuers is crucial to mitigate the risk of greenwashing. Schneeweiß (2019) found that only a small number of issuers, 186 out of 429, disclosed any information about their projects. He proposed that comprehensive documentation of all projects, the allocation of projects to individual bonds, and the disclosure of the amount invested in each project are crucial to address this issue. This finding is consistent with the conclusions of Sartzetakis

(2021). In addition, Tuhkanen & Vulturius (2020) found that many green bond issuers do not align their bonds with their climate targets and do not take an extensive approach to the transition to carbon neutrality. They also discovered deficiencies in post-issuance reporting, suggesting that issuers were not sufficiently pressured by investors, regulators, or society to increase transparency and reduce the risk of greenwashing. This is consistent with the findings of Kalesnik et al. (2022), who claim that investor reporting of carbon emissions is inadequate and based only on self-assessments, which are overestimated by at least 2.4 times. Subsequently, researchers emphasize the importance of certification (green verification) of financial instruments (Migliorelli, 2020; Bachelet et al., 2019), as well as external auditors and public monitoring (Lu, 2021).

The studies reviewed suggest that the relationship between green bond issuance and carbon emissions is complex and multifaceted. One key takeaway from this research is that the impact of green bond issuance on carbon emissions may not be immediate or straightforward. For example, Sinha et al. (2021) found that while green bond financing had a positive impact on environmental and social sustainability in the short term, its influence began to weaken in the long term, which is consistent with Ehlers et al. (2020). Similarly, Meo & Abd Karim (2022) found that the relationship between green finance and carbon emissions varied at different quantiles.

Given the complexity of the relationship between green bond issuance and carbon emissions, it is important to gain a deeper understanding of this relationship. In the methodology section, we will outline the approach used in this study to examine the association between green bond issuance and CO2 emissions in the EU-27 from 2013 to 2017.

3. Methodology

In this study, data on green Eurobonds issued in the EU-27 and CO2 emissions per capita in the EU-27 were collected from 2013 to 2017 using the Refinitiv Eikon database. The data were extracted in June and July 2022. The selected time frame of 2013 to 2017 was chosen due to the limited availability of green Eurobond emissions data before 2013 and a high number of missing data per country. Additionally, 2013 was the year in which corporate issuers and government-supported entities entered the market (Weber & Saravade, 2019). Eurobonds were chosen as the subject of the research study because they are the most prevalent in the listing of green bonds on the Euronext exchange (according to Statista (2022), they account for 85% of the total value of green bonds listed on the Euronext exchange).

At the time of data extraction, CO2 emissions data for all member states up to 2017 were published in the Refinitiv Eikon database. Data for CO2 emissions per capita were calculated using Eurostat data on the population of each country. Table 1 presents data on green Eurobond issuance in various European Union member states from 2013 to 2019. It includes total green bond issuance for each year in each country, as well as cumulative total issuance for the period 2013 to 2017, plus 2013 to 2019 for comparison.

Table 1 EU green bonds issuances by country in the period 2013 to 2019 (in 000 000 EUR)

	2013	2014	2015	2016	2017	2018	2019	SUM 2013-2017	SUM 2013-2019
Finland	108	482	594	1,866	42,127	600	3,374	**45,178**	**49,151**
Luxembourg	3,304	5,644	2,915	5,507	6,960	6,967	8,025	**24,331**	**39,323**
Germany	300	3,341	5,715	3,921	7,080	5,690	19,797	**20,357**	**45,844**
Netherlands	0	1,250	3,763	5,627	8,751	8,858	21,158	**19,391**	**49,406**
France	1,946	5,573	6,158	5,568	0	6,616	27,496	**19,246**	**53,358**
Sweden	170	1,240	1,420	2,727	3,707	6,323	10,956	**9,264**	**26,543**
Spain	0	530	0	790	2,786	3,190	7,446	**4,106**	**14,742**
Italy	0	513	0	375	1,693	2,005	5,851	**2,581**	**10,437**
Denmark	0	0	547	0	1,370	750	10,915	**1,918**	**13,583**
Poland	0	0	0	750	0	1,000	2,197	**750**	**3,947**
Austria	0	0	0	0	303	0	0	**303**	**303**
Lithuania	0	0	0	0	300	368	0	**300**	**668**
Belgium	0	0	0	55	112	10,930	0	**167**	**11,097**
Latvia	0	0	100	25	20	0	0	**145**	**145**
Estonia	0	0	50	0	0	0	0	**50**	**50**
Czech Republic	0	0	0	0	41	0	0	**41**	**41**
Ireland	0	0	0	0	0	6,849	1,200	**0**	**8,049**
Portugal	0	0	0	0	0	0	1,110	**0**	**1,110**
Greece	0	0	0	0	0	0	150	**0**	**150**
Slovenia	0	0	0	0	0	75	0	**0**	**75**
Hungary	0	0	0	0	0	0	0	**0**	**0**
Romania	0	0	0	0	0	0	0	**0**	**0**
Slovakia	0	0	0	0	0	0	0	**0**	**0**
Bulgaria	0	0	0	0	0	0	0	**0**	**0**
Cyprus	0	0	0	0	0	0	0	**0**	**0**
Croatia	0	0	0	0	0	0	0	**0**	**0**
Malta	0	0	0	0	0	0	0	**0**	**0**
EU (27)	**5,828**	**18,574**	**21,263**	**27,211**	**75,250**	**60,222**	**119,674**	**148,127**	**328,022**
Annual change		**+219%**	**+14%**	**+28%**	**+177%**	**-20%**	**+99%**	-	-

Source: Authors' work (calculations based on the Refinitiv database)

The table illustrates that in 2017, Finland had the highest green bond issuance at 42,127, followed by Luxembourg and Germany. The total green bond issuance for the EU-27 increased from 5,828 million EUR in 2013 to 75,250 million EUR in 2017, and then to 119,674 million EUR in 2019. The green Eurobond market experienced strong growth from 2013 to 2017, followed by a decline in 2018 (-20%), but after that it continued to grow in 2019, almost doubling the values from the previous year. This demonstrates that the rise of the green Eurobond market is not just a temporary trend. From 2014 to

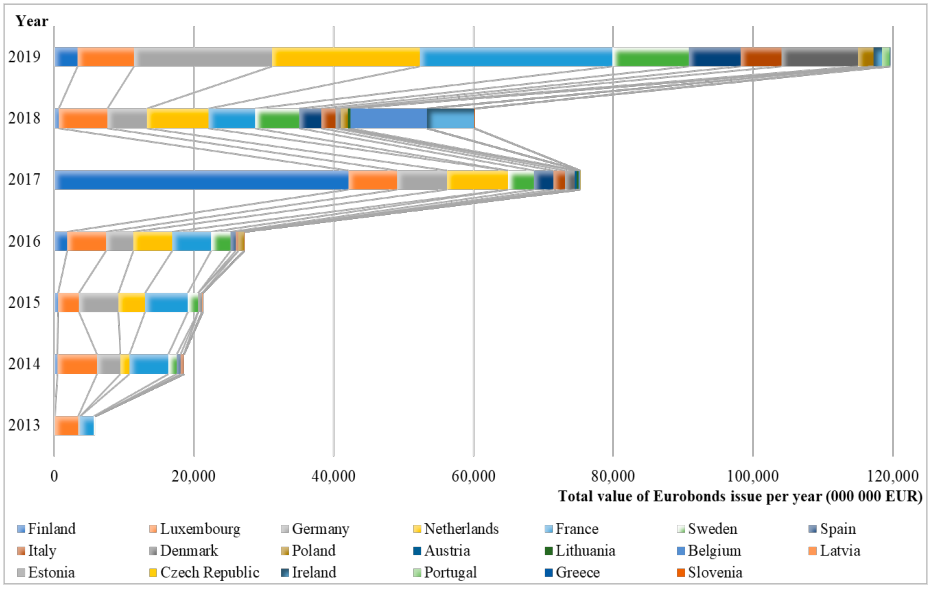
2021, approximately 35% of total green bond proceeds in Europe were invested in the energy sector, followed by housing with a 28% share and transport with 18%. A similar trend can be observed on the global market level, where the value of green bonds issued worldwide increased from USD 37 billion to USD 269 billion from 2014 to 2019, almost doubling by 2021, with Europe's share at 45.3% in 2019 and 52% in 2021, followed by Pacific Asia with 25% in both years observed (Statista, 2022).

Due to limited data availability, as shown in Table 1, which is the main limitation of this study, descriptive statistics and linear correlation were used to investigate the association between green Eurobonds issued and CO2 emissions per capita in the EU-27. Data analysis was performed using the SPSS PC+ statistical software package and Microsoft Office Excel.

4. Results

The results of the analysis show a significant increase in the issuance of green Eurobonds in the European Union during the period from 2013 to 2017. This trend continued in 2019, with the exception of a slight dip in 2018. A total of 20 EU member states issued green Eurobonds during the analysed period, with three countries that had issued bonds prior to 2013 and four countries that have not issued any green Eurobonds at all (Bulgaria, Cyprus, Malta, and Croatia). Figure 1 illustrates green Eurobond issuance per country during the period from 2013 to 2019. These data provide an extensive review of the trend of green bond issuance in the European Union and highlights the countries that have been actively issuing green bonds to support low-carbon and climate-resilient global development in financial markets.

Figure 1 Value of EU-27 green Eurobond issues in the period from 2013 to 2019 (in 000 000 EUR)

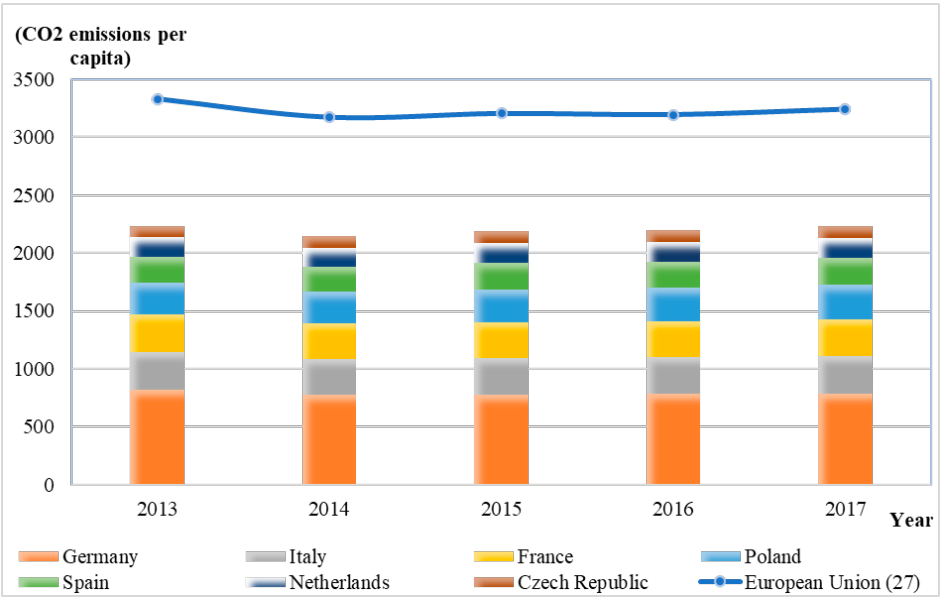


Source: Authors' work (calculations based on the Refinitiv database)

From the analysis of Figure 1, it is apparent that the issuance of green Eurobonds varies among European Union member states. During the period from 2013 to 2017, the largest issuers were Finland, Luxembourg and Germany, whereas in the more recent period from 2013 to 2019, the largest issuers were France, the Netherlands and Finland in terms of the value of the issues. The data also suggest that a few countries such as Finland, Germany, Sweden and Finland have been issuing green Eurobonds on an annual basis, while other countries have larger or smaller intervals between new releases.

On the other hand, Figure 2 illustrates the trends and provides a comparative analysis of CO2 emissions per capita for the EU-27 and major contributors to CO2 emissions in the EU-27 in the period from 2013 to 2017. The data in the figure also enable us to understand how the trends of green bond issuance and CO2 emissions per capita in the EU-27 are correlated during the observed period.

Figure 2 CO2 emissions per capita for the EU-27 and the largest contributors to EU-27 CO2 emissions



Source: Authors' work (calculations based on the Refinitiv database)

The analysis of EU-27 CO2 emissions per capita over the observed period from 2013 to 2017 reveals a lack of significant decrease in emissions. The trends over this period, as indicated by the percentage change in emissions, were -4.7%, 1.02%, -0.31%, and 1.45%, respectively, resulting in a total decrease of only 2.64% from 2013 to 2017.

Concurrently, there has been a significant increase in the annual value of green Eurobonds issues over this period. In particular, the annual value of these bonds increased by approximately 13 times in 2017 compared to 2013, and by 20.5 times in 2019 compared to the base year of 2013. Table 2 presents the results of the descriptive statistics analysis of the data on green Eurobonds issues and CO2 per capita.

Table 2 Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Green Eurobonds (EU-27)	48	20,000,000	42,127,391,662	3,329,002,586.04	6,313,460,011.353
CO2 per capita (EU-27)	80	3.60	19.18	8.1434	3.47871
Valid N (listwise)	48				

Source: Authors' work

The data show a large standard deviation in the annual value of green Eurobonds issued among countries and in years. Finland had the highest annual value at 42 billion EUR in 2017, while Latvia had the lowest annual value at 20 million EUR in 2017 (excluding countries that did not issue green Eurobonds during the observed period).

To determine the correlation between the annual value of green Eurobond issues and CO2 emissions per capita, a 2-tailed Pearson correlation was performed, as shown in Table 3.

Table 3 Linear correlation between issues of green Eurobonds and CO2 emissions per capita for the EU-27

		Green Eurobonds	CO2 per capita
Green Eurobonds (EU-27)	Pearson Correlation	1	.122
	Sig. (2-tailed)		.410
	N	48	48
CO2 per capita (EU-27)	Pearson Correlation	.122	1
	Sig. (2-tailed)	.410	
	N	48	80

Source: Authors' work

The results show that the correlation coefficient between green Eurobonds and CO2 per capita is .122 and the p-value is .410. This correlation coefficient indicates a weak correlation between these two variables. The p-value is greater than .05, which means that the correlation coefficient is not statistically significant and there is no indication that there is a true relationship between two variables.

5. Discussion and conclusion

The results of the analysis of data on issued green Eurobonds and CO2 emissions per capita of the EU-27 for the period from 2013 to 2017 indicate that while there was a significant increase in green bond emissions, there was only a modest decrease in CO2 emissions per capita. Additionally, the analysis found that there was no significant correlation between these two variables. These findings are aligned with previous research, such as the studies of Ehlers et al. (2020), Kant (2021), and Benlemlih et al. (2022), which also found no significant reduction in carbon emissions among green bond issuers. Furthermore, these results confirm the concerns about the potential for greenwashing with green financial instruments, as reported in previous literature (Schneeweiß, 2019; Tuhkanen & Vulturius, 2020; Sartzetakis, 2021). The risk of greenwashing seems to be greater the more the EU tries to accelerate the growth of the green bond market instead of focusing on its organic growth (Demary & Neligan, 2018).

Concerns about a possible link between green financial instruments and greenwashing are the very issues that the European Commission's Action Plan on Financing Sustainable Growth (European Commission, 2021) is attempting to address through improvements to the regulatory framework for green bonds. The plan includes the development of the EU Green Bond Standard (European Union, 2021) and guidance to improve the disclosure of climate-related information by companies and financial market participants. The foundation for these actions is the establishment of a clear and detailed EU taxonomy. This taxonomy allows for improved monitoring, reporting and assurance of green bond proceeds, making it easier for investors to invest in green bonds with confidence. These actions not only promote sustainable growth but also create business opportunities for entities, investors and financial intermediaries to participate in the transition to a more environmentally sustainable economy.

In summary, the analysis highlights the need for more research to fully understand the relationship between green bond issuance and carbon emissions. While an increase in green bond issuances may indicate a shift towards more sustainable investments, it may not necessarily result in a decrease in CO2 emissions. It is also important to note that further research is needed to understand the underlying factors that may contribute to strengthening the relationship between green bond issuances and carbon emissions reduction. Future studies may benefit from a more extensive and long-term examination of green bond projects and their impact on carbon emissions. Additionally, it would be valuable to explore the specific characteristics of green bond projects and issuers that may be associated with reduced carbon emissions.

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PREDICTION OF INSOLVENCY USING LOGISTIC REGRESSION: THE CASE OF THE REPUBLIC OF SRPSKA

Abstract

Purpose: In this paper, the authors try to develop a model for predicting the insolvency of trading companies from the Republic of Srpska. The research seeks to determine the statistically most significant financial indicator in predicting the insolvency of trading companies in the Republic of Srpska.

Methodology: The research data sample in this paper consists of yearly data from 2017 to 2020 for two hundred trading companies from the Republic of Srpska. Binary logistic regression was used to develop the model.

Results: As a result of the research, a model was created that successfully classifies 82.9% of solvent and 80% of insolvent companies, with a general efficiency rate of 81.4%.

Conclusion: Based on the empirical research results, we can conclude that the hypothesis has been confirmed that the LR model can be formed on the basis of selected financial indicators as a tool for predicting the insolvency of trading companies in the Republic of Srpska.

Keywords: Insolvency, bankruptcy, financial indicators, logistic regression, Republic of Srpska, trade

1. Introduction

The modern business environment is characterized by numerous and frequent changes, i.e., an extremely dynamic environment, in which change is the only constant. In such an environment, companies, especially those in trade, operate in highly competitive conditions, in which the greatest challenge is to survive in the "market competition" (Mikerević, 2011). One of the most common causes of the disappearance of companies from the market scene, according to the author of this paper, is insolvency, which in most cases results in the bankruptcy of the company. Given that the company is part of the environment in which it operates and that there is interdependence between the company as a legal entity and its environment, the disappearance of the company creates a series of negative circumstances for various stakeholders related to the company (Mikerević, 2011). Consequently, it is

very important to anticipate the onset of insolvency in order to take appropriate measures in a timely manner in order to prevent the negative social and economic consequences that insolvency entails.

Taking into account the above, and the fact that according to the data provided by the Statistical Office of the Republic of Srpska for the period 2011-2020 (except for 2018), trade has the largest share as an economic activity in the structure of the gross domestic product of the Republic of Srpska, a research hypothesis in this paper is: Based on the selected financial ratios, the LR model can be formed as a tool for predicting the insolvency of companies engaged in trade in the Republic of Srpska.

In the last half century, numerous models have been developed for the purpose of predicting company insolvency (Altman's model, Zmijewski model, Fulmer model, Kralicek model). These models differ in terms of the variables they are based on, the activities they are applicable to, and the countries they have been developed in. Consequently, according to the authors of this paper, the application of one model in different economic activities within the same country will not result in the same degree of precision in predicting bankruptcy or insolvency, nor will the application of the same model to the same economic activities but in different countries, given that there are differences in socioeconomic and institutional business conditions.

Bearing in mind the above, the problem of predicting the insolvency of companies is still relevant both in Bosnia and Herzegovina and in the countries in the region (Salkić, 2013; Mijić & Andrašević, 2017; Bogdan et al., 2019; Lukić, 2020).

The following is an overview of the results of some relevant research conducted around the world, the subject of which was the assessment of the reliability of the model for predicting company insolvency.

Kovacova and Kliestikova (2017) tested the applicability of Altman's model, Zmijewski's model, Taffler's model, Fulmer's model and Springate's model to the example of companies from Slovakia. Based on the obtained results, they conclude that all analyzed models have a low accuracy rate (50%), and that the analyzed models can hardly be used in business conditions that differ from the business conditions of the country in which they were originally developed.

Indriyanti (2019) analyzed the accuracy of models for predicting financial difficulties (Altman, Springate, Fulmer, Taffler, Grover, Zmijewski and Ohlson) on the example of the 25 largest global technology companies according to the Forbes list. The obtained results showed that the highest percentage of reliability was recorded by Grover's model (96%), followed by Altman's model (86%) and Taffler's model (85%), while Fulmer's model recorded the lowest reliability rate (40%).

Tanjung Sutra (2020) tested the accuracy of Altman's, Springate's, Ohlson's and Zmijewski's models on the example of 9 pharmaceutical companies listed on the Indonesia Stock Exchange. Based on the obtained results, the author concludes that Altman's model is the most accurate in predicting financial difficulties for pharmaceutical companies listed on the Indonesia Stock Exchange. The period of analysis was from 2013 to 2017.

Aguilar et al. (2021) tested Altman's model on the companies listed on the Mexican Stock Exchange. The analysis covers 155 companies and the period from 2012 to 2019. Based on the obtained results, the authors conclude that the level of accuracy of Altman's model in terms of predicting company bankruptcy decreases when it is applied to Mexican companies. The percentage of model error is 18% based on the original time frame. This model error is high enough to confirm the low accuracy of the model.

Bahaa and Bahaa (2021) tested the applicability of Altman's model to industrial companies listed on the Palestine Stock Exchange. The analysis included 12 industrial companies and covered the period from 2013 to 2017. Based on the obtained results, the main hypothesis, according to which Altman's models cannot predict business performance of the analyzed companies, was contested.

Wahyuningsih and Venusita (2022) tested the accuracy of the Altman model, the Springate model, the Zmijewski model, the Fulmer model and the Grover model for predicting corporate bankruptcy. The testing was conducted on a sample of 28 retail companies listed on the Indonesia Stock Exchange and the analysis period was from 2019 to 2020. Based on the obtained results, they conclude that the analyzed models give different accuracy rates and that all the analyzed models can be used to predict the financial difficulties of the retail companies in Indonesia.

Özparlak (2022) tested the applicability of the Altman, Springate, Ohlson, Fulmer, Zmijewski Canada and Grove models to 16 companies from the US energy sector. The research results showed that the Zmijewski model is the most successful

model for predicting bankruptcy of companies in the energy sector in the USA. The model that best predicted bankrupt and non-bankrupt companies one and three years prior to bankruptcy was again Zmijewski's model. However, Fulmer's model is the best predictor of bankruptcy two years prior to bankruptcy. On the other hand, according to other research results, the accuracy rate of the Altman, Springate, Canadian, Fulmer and Grover models is significantly below average compared to other research studies.

Below is an overview of the results of some relevant research conducted in the region and the Republika Srpska.

In the Republic of Serbia, Muminović et al. (2011) tested the prognostic power of Altman's Z, Z' and Z" models in the period from 2006 to 2009 on a sample of 73 companies that belonged to the BELEX15 and BELEXline index, excluding companies from the financial sector. According to the obtained results, those models are not reliable for predicting the insolvency of companies in developing markets due to a relatively high value of a type II error.

Obradović et al. (2018) developed a model for predicting the insolvency of manufacturing companies operating in the Republic of Serbia, using binomial logistic regression, whose accuracy in the classification of solvent and insolvent companies is 82.9% and 93.3%, respectively, while the overall average accuracy of the model is 88.4%.

Zenzerović (2009) analyzed Croatian service and manufacturing companies in the period from 1996 to 2006 and developed two models for predicting bankruptcy, i.e., a model for predicting financial instability of manufacturing companies and a model for predicting financial instability of service companies. Both models resulted in a high degree of accuracy in predicting bankruptcy, even one year before bankruptcy.

Bogdan et al. (2019) tested the possibility of applying Altman's Z-score model in the Republic of Croatia and tried to adjust the weights of the Z" score model in order to obtain a model that will be more adapted to the Croatian market. By applying multiple discriminant analysis, based on which the variable X1 was eliminated from the original model, the authors concluded that the adapted model Zk has a lower percentage of prediction success than the original model.

In Bosnia and Herzegovina, Salkić (2013) tested the feasibility of applying Altman's models for assessing the creditworthiness of companies. Based on the obtained results, the author concludes that Altman's Z-score and Z'-score models do not have the appropriate level of forecasting accuracy, which is why they should be used with caution and only as a supplement to traditional financial analysis. This is because the Z-score model correctly classified 16 out of 20 companies that fail to meet their obligations, and it incorrectly classified 13 out of 20 companies that regularly settle their obligations. On the other hand, the Z'-score model did not classify any company that duly settles its obligations as financially problematic (Bešlić, 2016).

Mijić and Andrašević (2017) tested the reliability of the application of foreign models (Altman's, Bek's, Springate's, Zmijewski's, Kralicek's models) for predicting bankruptcy of companies in the Republic of Srpska. Based on the obtained results, these authors concluded that foreign models (Altman's, Bek's, Springate's, Zmijewski's, Kralicek's models) are not adequate for predicting bankruptcy of companies operating in the Republic of Srpska. Namely, the maximum accuracy (80%) of the model in the projection of bankruptcy of a company for which bankruptcy proceedings were opened the following year is achieved by the Springate and the Zmijewski model. The accuracy of the Altman Z-score model is 70%. The authors conclude that in order to reliably project business success of companies, especially bankruptcy, in the Republic of Srpska it is necessary to develop models according to the specifics of the economic environment of the Republic of Srpska.

Božić and Stevanović (2017) analyzed the applicability of certain models for predicting bankruptcy of companies in the Republic of Srpska. The obtained research results are as follows: for the corrected model Z', the degree of accuracy is 74.43% with error type I and error type II amounting to 25.06% and 27.37%, respectively. By testing the original EM score model, an accuracy degree of 67.03% was obtained; however, error type I was 33.05% and error type II was 32.63%. These results are consistent with the results of previous tests conducted by these authors in 2016.

Based on the above, it can be concluded that the model developed in the Republic of Srpska has the highest degree of classification accuracy (Božić & Stevanović, 2017).

Taking into account the above, the goal of the research is to develop a model for predicting the insolvency of trading companies registered on the

territory of the Republic of Srpska using a binomial logistic regression model.

The paper is divided into four sections. A theoretical framework is given in the first section, in which insolvency is defined and the models most commonly used for forecasting insolvency are presented. The research methodology is presented in the second chapter. Research results are given in the third section, that is, the process of forming the model itself and the assessment of the reliability of the created model. The conclusion of the research is given in the fourth section.

2. Theoretical framework of research

2.1 The concept of (in)solvency

The notion of the ability to pay has been accepted in domestic theory and practice as a synonym for the notion of solvency, which originates from the Latin word *solvens*, meaning one who is able to pay - the ability of an economic entity to meet its obligations in the long run (Kukoleča, 1990). As such, the notion of solvency entered the economic sciences from the legal sciences, more precisely, from property law (Pavlović & Milačić, 2013).

Due to the widespread view that solvency is the ability of a company to meet due obligations, solvency is often equated with liquidity (Enyi, 2008). However, there is a difference between liquidity and solvency. Namely, liquidity is defined as the ability of a company to meet its due obligations, while solvency covers a wider time horizon. Solvency is thus equated with the solvency of the company, and it implies its ability to settle all its due obligations with the available money at one time, even from the bankruptcy estate (Mikerević, 2016).

The solvency of a company is quantified by solvency ratios, which represent the ratio between business assets and debts (Rodić & Filipović, 2013). It shows the ability of the company to settle all obligations after the liquidation of the assets at its disposal.

$$Solvency\ ratio = \frac{(Business\ assets)}{Debts} \quad (1)$$

Source: Mikerević, 2011

The solvency ratio should be greater than 1 for the company to be considered solvent.

Taking into account the definition of solvency, insolvency is a situation in which a company is unable to meet its obligations based on available assets, even from the bankruptcy estate. This actually means that the ratio of operating assets to total liabilities is less than 1, and in such a situation if the company liquidated all assets shown in the balance sheet (book value of assets), it could not settle total liabilities by the difference between total liabilities and operating assets (Bešlić, 2016). Therefore, insolvency is a situation in which the company is not able to settle due liabilities even from the bankruptcy or liquidation estate (Grdić et al., 2009). Insolvency is defined in a similar way by Professor Mikerević (2016) who states that insolvency is a threat to the survival of the company and that it is one of the main causes of the disappearance of the company from the market scene because it is unable to pay its obligations with available money. As such, insolvency is the reason for initiating bankruptcy proceedings pursuant to the Bankruptcy Law of the Republic of Srpska, according to which it takes place if the bankruptcy debtor does not settle its due financial obligations within 60 days, or if the bankruptcy debtor's account has been blocked for 60 days continuously (Official Gazette of the Republic of Srpska, 2016).

2.2 Insolvency prediction models

Bankruptcy prediction models can be divided into two groups: classic (traditional) models and modern models.

Classical models include (Bešlić, 2016) financial analysis based on the analysis of financial indicators, statistical techniques that can be subdivided into univariate data analysis techniques of one variable, multivariate techniques such as linear multiple discriminant analysis, logit and probit analysis, mathematical models for linear programming and expert systems. Modern models can include decision trees, artificial neural networks, genetic algorithms and rough sets.

In this paper, attention is focused on statistical techniques for predicting insolvency.

According to Zenzerović and Peruško (2006), linear probability models are models that use a combination of independent variables to estimate the probability of opening bankruptcy proceedings. The model is shown by equation (2):

$$P_i=\beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n + \varepsilon_i \ , \quad (2)$$

Source: Zenzerović & Peruško, 2006

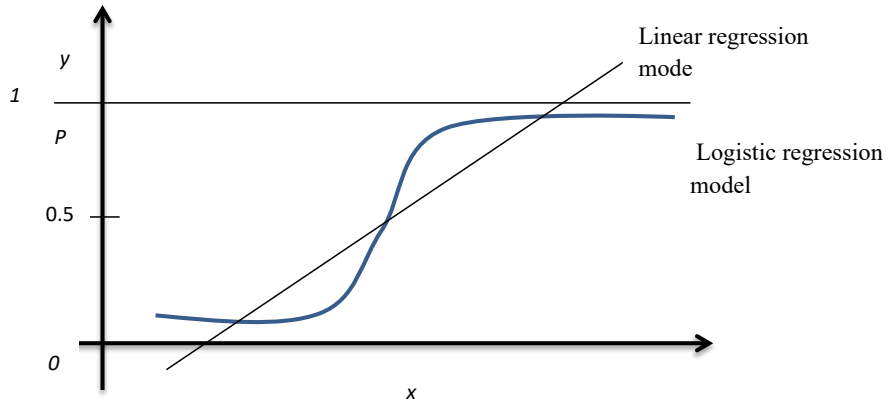
where:

- P_i is the probability of initiating bankruptcy proceedings,
- $X_1...X_n$ is the value of the independent variable significant for bankruptcy prediction, n represents the number of variables,
- $\beta_1...\beta_n$ is the weighted arithmetic mean of independent variables, and
- ε_i is the standard error.

Logit and probit analysis occur in response to the shortcomings of the linear probability model. Logit and probit prediction models result in the calculation of the probability of initiating bankruptcy in the interval between 0 and 1. In addition, the starting point is the assumption that the relationship between dependent and independent variables is nonlinear, which is much closer to reality.

In this paper, the logistic regression model will be used as a form of logit analysis for the purpose of predicting insolvency payments. Graph 1 provides an overview of the linear and logistic regression model.

Graph 1 Logistic regression model



Source: Pešić, 2016

Based on the shape of the functions of these two models, it can be concluded that the application of a linear regression model for predicting a binary event, such as corporate bankruptcy, may result in certain values of the independent variable *x*, probability *p(x)* can take nonstandard values, that is, it can have a negative value or, on the other hand, a value greater than 1, which is not acceptable from the aspect of possible probability values, because it ranges from 0 to 1. For this reason, the application of the logistic regression model is more adequate in this paper.

3. Research methodology

Based on the results of previous research on the development of bankruptcy prediction models (Obradović et al., 2018; Lukić, 2020; Pervan, 2017; Poljašević & Grujić, 2020), it can be concluded that the method of binomial logistic regression is used as the most common method for forming and developing a model for predicting corporate bankruptcy. Taking into account the above, the binomial logistic regression method was used for the purpose of developing a model.

The binomial logistic regression model is a statistical model that determines the influence of a set of *n* metric independent (predictor) variables x_i, which can be of any type (non-measurable or categorical), on the binary (dichotomous) dependent variable y_i (Bešlić, 2016). The dependent variable y_i in the binary logistics model is logit, i.e., the natural logarithm of the chance of success, which represents the ratio of the probabilities of the first and second choice, which can be written as follows:

$$logit[p(x)] = y_i = ln \frac{p(x))}{(1\text{-}p(x))} \quad (3)$$

Source: Adapted from Harrell, 2015

The dependent variable is coded by adding 0 to one outcome and 1 to the other possible outcome, where 0 most often means "failure" and 1 "success"

(Pešić, 2016). Thus, the expected value of the dependent variable in the binary logistic regression model for a given value of the independent variable ranges from 0 to 1.

The logistic regression model has the following form:

$$P(y_i = j) = p(x) = \frac{e^{y_i}}{1+e^{y_i}} = \frac{1}{1+e^{-y_i}} \quad , \tag{5}$$

Source: Adapted from Obradović et al., 2018

where:

$p(x)$ - a predicted probability that the company will be in state j; *j = 0,1,2 ...n; j = 0: no bankruptcy and condition 1: bankruptcy*,

y_i- dependent variable form

$$y_i = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \ldots + \beta_n x_n \, ,$$

e - the natural logarithm, e = 2.718281828459,

β_0 - a constant, the value of the criterion when the predictor is equal to 0 (zero). This is a chance for a company to be classified into one of two categories before it is introduced into predictor variable analysis,

$\beta_1 \ldots \beta_n$- regression coefficients for n independent variables. They show how much the logarithm of the chances that the company will be in the group of companies that are in bankruptcy changes when the given independent variable is changed by one unit and the others are kept constant.

Logistic regression was applied in this paper in the IBM SPSS (Statistical Package for Social Sciences) 23 software platform. In this paper, the stepwise logistic regression method was applied - Backward LR - as a variant including independent variables, that is, the stepwise method was applied based on the probability quotient test, i.e., the LR test (*Likelihood Ratio Test*) for selected significant independent variables that explain the dependent variable. The Backward LR method assumes that all independent variables are initially included in the model, and then those with a lower degree of explanation of variations are eliminated.

A sample of 200 companies was selected for the purpose of developing a model for predicting the insolvency of trading companies from the Republic of Srpska.

The sample consists of companies in section G - wholesale and retail trade, which are registered on the territory of the Republic of Srpska, and which submitted financial reports to the Agency for Intermediary, IT and Financial Services (APIF) in the period from 2017 to 2020. The sample of 200 companies was divided into two groups in the ratio 70:30%, because this ratio was more frequently used in previous empirical research (Dvořáček et al., 2012; Bunyaminu & Issah, 2012; Andreica, 2013; Obradović et al., 2017). The first group, which is used for model development, consists of financial indicators of 140 companies, and the second group, which is used for model testing, consists of financial indicators of 70 companies. In addition to the 70:30% division of causes, an 80:20% division can also be used.

The sample of 140 companies, which is used for model development, is divided into two groups of companies: solvent (70) and insolvent (70) companies. For the purpose of this research, insolvent companies are those that, according to APIF data, had a blocked account for more than 60 days and over which, according to the Bankruptcy Law of the Republic of Srpska, bankruptcy proceedings should have been initiated. Solvency companies, on the other hand, are all those companies that have had a blocked account for less than 60 days.

Thus, the sample for model development consists of financial indicators of 70 insolvent companies and an equal number of solvent companies. Thirty percent of the companies from the total sample of 200 companies, as already mentioned, are used to test the model to determine whether the newly created model has the generalization ability, i.e., whether it can be applied to other data outside the sample. The test sample consists of 60 new companies outside the model development sample, which is divided into 30 solvent and as many insolvent companies.

All 200 companies were selected from a population that originally consisted of 2,166 companies applying the following elimination criteria:

- Companies that did not appear in the APIF records for at least two consecutive years were eliminated. This means that companies that did not appear in the APIF records in 2018 were eliminated from 2017, etc.
- Companies with the majority of AOP positions in the financial statements equal to zero were eliminated.

After atypical data analysis, it was determined that atypical data appear in a total of 26 analyzed companies included in the original sample of 226 companies. Taking into account the above, of the 226 companies that made up the sample, after eliminating 5% of the lower and upper cases, 200 companies remained, of which 100 were solvent and 100 were insolvent.

Different financial indicators from the following groups of indicators are used as independent variables: liquidity, solvency, profitability, activity and indebtedness, which are calculated on the basis of the financial statements of the sampled companies. From the previously mentioned groups of financial indicators, a total of 23 indicators were analyzed. The method of encoding the dependent variable, which is a categorical numerical variable, is given in Table 1.

For companies that are solvent, i.e., whose account has been blocked for less than 60 days, the value of the dependent variable is 0, and for companies that should have opened bankruptcy proceedings, i.e., those that had a blocked account for 60 or more days, the dependent variable takes on the value 1.

Table 1 Coding of variables

Dependent Variable Encoding	
Original Value	Internal Value
THE COMPANY IS SOLVENT	0
THE COMPANY IS NOT SOLVENT	1

Source: Authors, SPSS result

4. Research results

4.1 Creating a model for predicting insolvency

A model for predicting the insolvency of trading companies registered on the territory of the Republic of Srpska was developed after the 13th iteration (Table 2) by applying the stepwise logistic regression procedure based on the probability quotient test, i.e., the LR test (Likelihood Ratio Test) for selecting significant independent variables X_i, and Backward LR variants that explain the dependent variable y_i. The newly created model is based on seven of the initial 23 financial indicators: (1) the quick liquidity ratio (UL), (2) coverage level I (NP_I), (3) coverage level II (NP_II), (4) the total asset turnover ratio (KOUI), (5) the current assets turnover ratio (KOOI), (6) net profit margin (NPM), and (7) the financial stability ratio (KFS).

Table 2 Financial indicators included in the model for predicting the insolvency of commercial enterprises

Equation variables									
		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
								Lower	Upper
Step 13[a]	UL	.611	.346	3.125	1	.077	1.842	.936	3.627
	NP_I	.135	.074	3.309	1	.069	1.145	.990	1.325
	NP_II	-.086	.056	2.312	1	.128	.918	.822	1.025
	KOUI	-2.244	.615	13.297	1	.000	.106	.032	.354
	KOOI	.449	.232	3.728	1	.054	1.566	.993	2.470
	NPM	-.121	.050	5.734	1	.017	.886	.803	.978
	KFS	.004	.010	.191	1	.662	1.004	.985	1.024
	Constant	.153	.385	.157	1	.692	1.165		

Source: Authors, SPSS result

Starting from expression (5), the binomial model of logistic regression for predicting the insolvency of companies engaged in trade activities registered on the territory of the Republic of Srpska reads:

$$p(x)= \frac{e^{0,153+0,611X_1+0,135X_2-0,086X_3-2,244X_4+0,499X_5-0,121X_6+0,004X_7}}{1+e^{0,153+0,611X_1+0,135X_2-0,086X_3-2,244X_4+0,499X_5-0,121X_6+0,004X_7}} \quad (6)$$

or

$$p(x) = \frac{1}{(1+e^{-(0,153+0,611X_1+0,135X_2-0,086X_3-2,244X_4+0,499X_5-0,121X_6+0,004X_7)}} \quad (7)$$

where:

p(x) - the estimated probability of insolvency; e - natural logarithm; X_1 - quick liquidity ratio; X_2 - coverage level I; X_3 - coverage level II; X_4 - total asset turnover ratio; X_5 - coefficient of current asset turnover; X_6 - net profit margin; X_7 - coefficient of financial stability.

Based on the data from Table 2, we see that the ratio of accelerated liquidity, the coverage level, the coefficient of current asset turnover and the coefficient of financial stability have positive signs, which is not logical if we look at these indicators separately in relation to a company's solvency. However, it should be noted, as stated earlier, that these indicators are observed and interpreted together with other indicators that entered the model, that is, on the basis of which the model was created, and that based on their aggregate value, it is determined whether the company will be insolvent or not.

In the model equation for predicting the insolvency of a trading company, independent variables coverage level II, the total asset turnover ratio and net profit margin have negative regression coefficients (B3, B4 and B6), which means that an increase in the value of some of the mentioned independent variables by 1% will cause a decrease in the predicted probability of corporate insolvency by as much as the coefficient with the given independent variable. Other variables in the model have positive values of the coefficients (B1, B2, B5 and B7), and accordingly, their interpretation is opposite to the interpretation of the negative coefficients.

4.2 Reliability assessment of the newly created model for predicting the insolvency of trading companies in the Republic of Srpska

Different statistical procedures can be used to assess the reliability of the developed model. In this paper, the following tests and methods were used to assess the reliability of the developed model: the omnibus test (*goodness-of-fit*), Pseudo R^2 (the *Cox & Snell R^2 test* and *Nagelkerke R^2*), the Hosmer and Lemeshow test, and the classification table.

4.2.1 Omnibus test

Whether the developed model predicts the results well, i.e., how accurately it predicts the riskiness of a company, is shown by the omnibus test called goodness-of-fit. The goodness-of-fit test is based on the chi-square (x^2) distribution and this test tests the null hypothesis (H0) against the alternative hypothesis (HA). The null hypothesis actually implies that it is a justified step to include independent variables, i.e., financial indicators, in the logistic regression model (Obradović et al., 2018).

H0: The logit model is well-fitted, i.e., customized.

HA: The logit model is not well-fitted.

The results of the omnibus test are given in Table 3. The probability (p) value of obtaining the chi-square value is given in the column Sig. To say that the model is well-fitted, i.e., to accept the null hypothesis (H0), it is necessary that the value of Sig. is less than 0.05.

Table 3 Omnibus test for regression coefficients of the developed model

Omnibus Tests of Model Coefficients				
		Chi-square	**df**	**Sig.**
Step 1	Step	75.198	19	.000
	Block	75.198	19	.000
	Model	75.198	19	.000
...				
Step 12[a]	Step	-2.201	1	.138
	Block	66.891	8	.000
	Model	66.891	8	.000
Step 13[a]	Step	-2.665	1	.103
	Block	64.226	7	.000
	Model	64.226	7	.000
a. A negative chi-square value indicates that the chi-square value has decreased from the previous step.				

Source: Authors, SPSS result

For the model obtained in the last step (13), the chi-square is 64.226 with 7 degrees of freedom, and the p-value is 0.000, which is less than 0.05. Based on the p-value of the omnibus test from step 13, we conclude that the developed model is well-fitted, i.e., adjusted to the data from the sample.

4.2.2 Pseudo R^2

Pseudo R^2 indicators, the most common among which are the *Cox & Snell R Square* (R^2) and the *Nagelkerke R Square* (R^2) measure how much of the variance of the dependent variable is explained by the created model, i.e., variances of independent variables. The values of Cox & Snell R^2 and Nagelkerke R^2 range from 0 to 1, with values greater than 0.4, indicating that the logit model is well adapted (Braun et al., 2013). Table 4 presents the pseudo R^2 indicator values.

Table 4 Values of pseudo R^2 - Cox & Snell R^2 and Nagelkerke R^2

Model Summary			
Step	**-2 Log likelihood**	**Cox & Snell R^2**	**Nagelkerke R^2**
1	118.883[a]	.416	.554
...			
11	124.989[c]	.390	.519
12	127.190[a]	.380	.506
13	129.855[a]	.368	.491
a. Estimation terminated at iteration 9 because parameter estimates changed by less than .001.			
b. Estimation terminated at iteration 8 because parameter estimates changed by less than .001.			
c. Estimation terminated at iteration 10 because parameter estimates changed by less than .001.			

Source: Authors, SPSS result

Based on the data presented in Table 4, it can be seen that the model created in the last step of gradual logistic regression explains between 36.8% and 49.1% of the variance of the dependent variable. When it comes to the value of pseudo R^2, there is no agreement in the statistical literature on the value of pseudo R^2, which is why its value should be considered together with the values of other indicators in the overall evaluation of the model (Tušek & Gabrić, 2017). Given that the value of Nagelkerke's R2 is greater than 0.4 (0.491), taking into account the critical value of this indicator, which is 0.4, as mentioned earlier, it can be concluded that the developed model adequately explains the variations of the dependent variable. In addition, the authors in the study *Using Data Mining to Predict Success in Studying* (Simeunović & Preradović, 2014) state that the obtained value of the Cox-Snell index and

the Nagelkerke index of 0.24 and 0.32, respectively, can be considered satisfactory. Taking into account the aforementioned research results, it can be concluded that the developed model can explain the variations of the dependent variable through all included predictor variables (financial indicators).

4.2.3 Hosmer-Lemeshow test

The claim that the model is good was also verified by using the Hosmer-Lemeshow test. It is the most reliable model prediction quality test. Unlike the omnibus test, in the Hosmer-Lemeshow test of small value statistics, the chi-square statistic indicates that the model is adjusted, while large values indicate that the model is not well adjusted to the data (Obradović et al., 2018). Accordingly, the model is supported if the p-value of the chi-square statistic is greater than 0.05.

Table 5 shows the p-value of the chi-square statistic of the Hosmer-Lemeshow test with 7 degrees of freedom for the developed model.

Table 5 Hosmer-Lemeshow test

Hosmer and Lemeshow Test			
Step	**Chi-square**	**df**	**Sig.**
1	8.967	8	.345
...			
11	6.990	8	.538
12	6.157	8	.630
13	8.138	8	.420

Source: Authors, SPSS result

The results given in Table 5 show that the value of the chi-square statistics of 8.138 is significant, i.e., the p-value of the Hosmer-Lemeshow test statistic is 0.420. As the p-value is greater than 0.05, it is concluded that the developed model agrees with the data.

4.2.4 Classification table and ROC curve

The classification table shows us how well the model predicts, that is, classifies each surveyed company into one of the two categories that the dependent variable can have. The classification table for both the model development sample and the test sample is given below.

Table 6 Classification table of the model for predicting the insolvency of trading companies in the Republic of Srpska

Classification Table[a]								
Observed			**Predicted**					
			Selected Cases[b]			**Unselected Cases[c]**		
			bankruptcy		**Perc. Correct**	**bankruptcy**		**Perc. Correct**
			0	**1**		**0**	**1**	
Step 1	bankruptcy	0	58	12	82.9	26	4	86.7
		1	12	58	82.9	11	19	63.3
	Overall Percentage				82.9			75.0
Step 12	bankruptcy	0	56	14	80.0	26	4	86.7
		1	14	56	80.0	5	25	83.3
	Overall Percentage				80.0			85.0
Step 13	bankruptcy	0	58	12	**82.9**	25	5	**83.3**
			14	56	**80.0**	6	24	**80.0**
	Overall Percentage				**81.4**			**81.7**
a. The cut value is .500								
b. Selected cases RT LT 1								
c. Unselected cases RT GE 1								

Source: Authors, SPSS result

Based on the model developed in the last logistic regression step (step 13), and from the previous table, it can be seen that within the sample for model development, the model accurately classifies 82.9% of companies that are solvent, which is the specificity of the model, and 80% of companies that are not solvent, which represents the sensitivity of the model. On the other hand, for the test sample, the model accurately classifies 83.3% of solvent companies and 80% of insolvent companies. If we look at the total accuracy of the model for the development sample, it is 81.4% (general efficiency of the model), and for the test sample, it is 81.7%. As the difference between classification accuracy of the developed model for the development sample and the test sample is only 0.3%, it is concluded that this prediction model is valid.

Taking into account the number of correctly and incorrectly classified companies from Table 7, type I error and type II error were calculated. Type I error, which implies that an insolvent company is classified as solvent, for the developed model, calculated for the model development sample, is 20% (100%-80%), while type II error, implying that a solvent company is classified as insolvent, amounts to 17.1% (100%-82.9%). Type I and type II errors for the test sample are 20% and 16.7%, respectively.

Table 7 Model efficiency

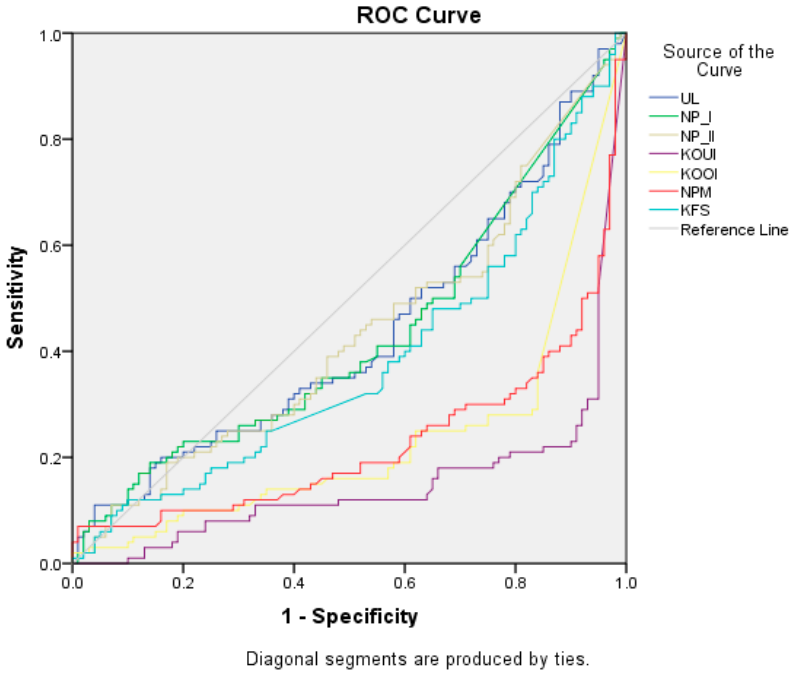
Observed	Predicted					
	Selected Cases			Unselected Cases		
	bankruptcy		TOTAL %	bankruptcy		TOTAL %
	0	1		0	1	
0	Specificity 82.9%	Type II error 17.1%	100.0	Specificity 83.3%	Type II error 16.7%	100.0
1	Type I error 20.0%	Sensitivity 80.0%	100.0	Type I error 20.0%	Sensitivity 80.0%	100.0

Source: Authors

It can be seen from Table 6 that the critical value for classifying companies into one of the two categories is $F^* = 0.50$. This means that if the calculated value of the predicted probability F is less than or equal to the critical value of insolvency F^* ($F \leq F^*$), then the company is classified into the group of solvent companies, otherwise it is classified as insolvent ($F > F^*$).

In addition to the statistical methods for estimating the newly created model that were presented previously, the ROC (*Receiver Operating Characteristic*) curve was also used. The ROC curve is a graphical representation of sensitivity and specificity for each possible result on the test (limit score) in the coordinate system, where the values of sensitivity are given on the ordinate (y) and on the abscissa (x) the specificity values are subtracted from 1 (Janičić & Novović, 2011). The ROC curve for the developed model is presented in Figure 1. As can be seen from Figure 1, the ROC curves of all financial indicators included in the model differ from the random outcome diagonal and are closer to the lower right corner of the coordinate system, which is why inverse values are given in Table 8.

Figure 1 ROC curve of the insolvency prediction model



Source: Authors, SPSS result

Table 8 Inverse values of the area under the ROC curve (AUC) of the model for predicting the insolvency of trading companies registered on the territory of the Republic of Srpska

Area Under the Curve					
Test Result Variable(s)	**Area**	**Std. Error[a]**	**Asymptotic Sig.[b]**	**Asymptotic 95% Confidence Interval**	
				Lower Bound	**Upper Bound**
UL	.567	.041	.101	.487	.647
NP_I	.570	.041	.089	.489	.650
NP_II	.568	.041	.095	.488	.648
KOUI	.849	.029	.000	.792	.907
KOOI	.765	.035	.000	.697	.834
NPM	.773	.035	.000	.705	.841
KFS	.619	.040	.004	.541	.697
The test result variable(s) UL, NP_I, NP_II, KOUI, KOOI, NPM, KFS has/have at least one tie between the positive actual state group and the negative actual state group. Statistics may be biased.					
a. Under the nonparametric assumption					
b. Null hypothesis: true area = 0.5					

Source: Authors, SPSS result

Taking into account the AUC (Area Under the Curve), and based on the data presented in Table 8, it can be seen that the total asset turnover ratio has very good diagnostic power, while the area below its ROC curve is statistically significant (AUC = 0.849, $p < 0.05$). Net profit margin as well as the turnover ratio have good discriminant power, and the area under their ROC curve is also statistically significantly different from the random sample diagonal (NPM: AUC = 0.776, $p < 0.05$; KOOI: AUC = 0.765, $p < 0.05$). The financial stability coefficient has sufficient diagnostic power, and the area under its ROC curve is statistically significant (AUC = 0.619, $p < 0.05$). Other financial indicators in the model have insufficient diagnostic power, because the area below the ROC curve ranges between 0.5 and 0.6.

5. Conclusion

In the development of a binomial logistic regression model for predicting the insolvency of trading companies registered on the territory of the Republic of Srpska, 23 financial ratios were used, which were calculated on a sample of 200 companies included in the research study. Based on the empirical research results, we can conclude that the hypothesis the LR model can be formed on the basis of selected financial ratios as a tool for predicting the insolvency of trading companies in the Republic of Srpska has been confirmed. Out of a total of 23 financial ratios, which were used as independent variables, the following 7 variables were singled out as those that contribute statistically significantly to predicting the insolvency of trading companies in the Republic of Srpska: (X_1) - quick liquidity ratio, (X_2) - coverage level I, (X_3) - coverage level II, (X_4) - total asset turnover ratio, (X_5) - coefficient of current asset turnover, (X_6) - net profit margin, and (X_7) - coefficient of financial stability.

Within the development sample, the developed model accurately classifies 82.9% of companies that are solvent and 80% of companies that are not solvent. On the other hand, for the test sample, the model accurately classifies 83.3% of solvent and 80% of insolvent companies. Total model accuracy for the development sample is 81.4% (general efficiency of the model), and for the test sample it is 81.7%. Type I error and type II error calculated for the model development sample are 20% and 17.1%, respectively, while type I error and type II error for the test sample are 20% and 16.7%, respectively.

The obtained results are in accordance with the results obtained in previous research conducted in the Republic of Srpska, which were discussed in more detail earlier in this paper. Namely, it has been confirmed that the model developed for the needs of a certain economic branch within a given economic system gives a higher degree of general efficiency than foreign models (Altman's model, Zmijewski's model and other foreign models analyzed). This is because the model developed for the needs of a given economic branch within a certain economy takes into account the specificities of the given economic branch, as well as the specificities of the economy of the given country.

When it comes to the limitations of this research, they are reflected in the fact that financial statements were used that were not audited, because in accordance with the Accounting and Auditing Law of the Republic of Srpska, a great number of companies do not have the obligation to audit financial statements.

The scientific contribution of the paper is also reflected in the newly created model for predicting the insolvency of companies, which is aimed at trading companies from the Republic of Srpska. During the preparation of this paper and the creation of the model, new facts and empirical knowledge were presented about financial indicators that can be predictors of the future insolvency of trading companies in the Republic of Srpska.

As possible directions for further research, we can single out the examination of the possibility of applying the newly created model in other economic areas, i.e., the examination of the reliability of the newly created model in companies not engaged in trade. Furthermore, it is necessary to find out in future research why financial indicators are related to predicting the bankruptcy of commercial companies in the Republic of Srpska and whether they can be used as such to predict the insolvency of commercial companies in the region.

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THE NEXUS BETWEEN TRANSPARENCY REPORTS AND SOFT SKILLS TRAINING IN AUDIT FIRMS

Abstract

Purpose: This study aims to identify and discuss educational practices of a selected set of audit firms operating in Turkey within the scope of corporate transparency reports.

Methodology: To address the basic research question, a sample of 52 audit firm disclosures in transparency reports are examined, and statistical analyses are conducted through SPSS.

Results: Audit firms affiliated with international bodies provide comparatively longer periods of non-technical or soft skills education in-house. Transparency reports published in Turkey are yet to be standardized, and audit firms are to systematically plan and enrich their education programs with a particular emphasis on soft skills.

Conclusion: Audit firms would gain from investing in the development of non-technical skills, which is not only limited by monetary concerns but also by other factors yet to be considered. The study also attempts to uncover any similarity/difference among audit firms' educational initiatives identified in transparency reports, and understand whether these initiatives translate into some meaningful relationships and outcomes.

Keywords: Transparency reporting, auditing, continuing education, audit revenue, soft skills

1. Introduction

During the last few decades, large companies made the headlines for their unethical accounting practices and audit-based corporate scandals, which spurred research into the *whys* and the *hows* undergirding the basic dynamics of accounting education and the auditing profession (Onumah et al., 2021). High-profile figures like Queen Elizabeth II of England inquired why no one was able to signal or prevent the advent of such wicked incidents. These scandals put a spotlight on accounting firms and auditing professionals, and in the years after, authorities have been experimenting with various response strategies from curriculum development to regulation and jurisdiction as potential strategies against similar malpractice.

As a positive externality of such historical experience on a global basis, audit firms around the world

are nowadays required to prepare and publish transparency reports, which is hoped to provide a useful outlet for communication with stakeholders and ensure high audit quality. The focus is on improving the quality of audit firms' work, and thus the auditing profession (Deumes et al., 2012; La Rosa et al., 2019; Johl et al., 2021). In addition, several recent changes have contributed to a transformation in the traditional practices of the accounting profession that has been particularly affected by the growth in size of international accounting and auditing firms, resulting in a comparatively higher level of commercial orientation (Sikka, 2008; Carrington et al., 2013; Coram & Robinson, 2017). Faced with such changes, public authorities and international professional organizations are striving to ensure a unity of practice to maximize professional quality. Among a plethora of important steps taken to this end is the Audit Quality Framework report issued by the International Auditing and Assurance Standards Board (IAASB) in 2014 with the aim of increasing awareness of audit quality. Quality Control Standard 1 (QCS 1) published by the IAASB in 2018 seeks to increase the quality of audit firms and the services they offer in a sustainable manner (International Auditing and Assurance Standards Board, 2018a). In addition to varied legislative arrangements across countries, international professional organizations have also prepared directives on transparency reporting to act as an important tool in improving the quality of audit and open the issue for a wider discussion.

With transparency reporting, there is an assumption that the quality of all processes of independent audit firms operating on behalf of the public will improve, which will, in turn, contribute to the quality of audit services offered (Deumes et al., 2012). In a report dated 2015, the International Organization of Securities Commissions states that audit firms' credibility benefits from transparency reporting, which, in turn, affects investor decisions (International Organization of Securities Commissions, 2015). The IAASB report of 2018 also states that the implementation of transparency reporting, which is mandatory in some countries, could function as a crucial differentiation tool in terms of allowing firms to explain their policies and approaches (International Auditing and Assurance Standards Board, 2018b). Transparency reporting allows audit firms to provide accurate and timely information to stakeholders regarding their audit policies and procedures (La Rosa et al., 2019). Corporate transparency practices are also considered to be effective in addressing the erosion of trust in independent audit mechanisms driven largely by recent large-scale corporate scandals (Čular, 2017; Pivac & Čular, 2012). Previous research recommends transparency reports as a fruitful platform for investigating the multifaceted effects of continuing education practices (Fu et al., 2015), and that transparency reports could operate as a system of restrictions on audit firms to ensure operational efficiency (Girdhar & Jeppesen, 2018).

In this context, the current study aims to identify and discuss the educational practices of a selected set of audit firms operating in Turkey within the scope of corporate transparency reports released between 2016 and 2018. The study specifically seeks to identify and explore the significance of non-technical/soft skills education for audit firms as reflected in their transparency reports and the existence, if any, of a relationship between firm revenue and education policies. To address the basic research question, a sample of 52 audit firm disclosures in transparency reports were examined to identify any differences in education policies as well as to explore any connection to firm revenue.

This study hopes to make several contributions. First, it attempts to identify education policy variations, especially in terms of non-technical or soft skills-oriented education initiatives of audit firms with different characteristics in terms of membership in international networks or revenue levels. Second, related to the first aim, this study attempts to uncover any similarity/difference among audit firms' educational initiatives identified in transparency reports and understand whether these initiatives translate into any meaningful relationships or outcomes. Third, this study focuses on a particular aspect of transparency reports published by audit firms in Turkey, which, to the best of our knowledge, is the first attempt to that end. Although the study raises more questions than it can attempt to answer, some insight can be gained from its findings. Given that the history of transparency reports is relatively young in Turkey, it would be highly preferable for stakeholders to identify any shortcomings before it is too late, and through such studies, specific country practices could be made available to an international audience for future research and/or business practice.

2. Background and hypothesis development

2.1 Regulatory framework for transparency reporting

Many countries struggle to reform the level and quality of information shared by audit firms with the public by introducing transparency reporting and related laws (Zorio-Grima & Carmona, 2019). In addition to requiring audit firms to prepare audit reports, regulatory authorities across different countries have different approaches to evaluating the compliance of those reports. A path for the implementation of transparency reporting in member states was created with the Directive 2006/43/EC adopted by the European Union (EU) Parliament on 17 May 2006. In 2014, another regulation containing provisions for transparency reporting (EU Regulation 537/2014, Article 13) was passed by the EU.

In the UK, the Transparency Reporting Act was introduced in 2006 and its implementation started in 2008. Since 2010, the Financial Reporting Council (FRC) in the UK has been reviewing transparency reports prepared by audit firms, making recommendations on those aspects of the reports that need improvement. A report, shared by the FRC in 2019, which examined the impact of transparency reports on stakeholders, strikingly shows that many of the members of audit committees, especially those of public companies, are not aware of the existence of transparency reports. A few who read the reports criticize them for being overly long and containing a lot of marketing messages (Financial Reporting Council, 2019).

By passing the Audit Development Act in 2012, Australia became one of the countries that requires transparency reporting within the scope of its law. Since 2013, all individual auditors and audit firms in Australia have been required to prepare transparency reports if they audit public companies, financial institutions, or other types of companies/institutions specified in the law (Australian Securities & Investment Commission [ASIC], 2013). Unlike in the UK, the ASIC shares the results of audits directly with the relevant companies (Fu et al., 2015; Oh & Dowling, 2014).

In 2008, similar acts were passed in Japan, where audit firms are now expected to publish explanatory documents annually and prepare transparency reports (Financial Services Agency, 2008). Japan also obliges accountants with a large-scale client base to prepare transparency reports (Fu et al., 2015).

In the United States, the Advisory Committee on the Auditing Profession of the U.S. Department of Treasury published its first recommendation report for transparency reporting in 2008 (Advisory Committee on the Auditing Profession, 2008). The report emphasizes the importance of ensuring transparency for audit firms by referring to the directive published by the EU. While transparency reporting for independent audit firms is not mandatory by law, the Public Company Accounting Oversight Board (PCAOB) imposes some obligations to improve transparency and quality. The PCAOB also introduced a series of regulations in the following years requiring independent audit firms, for example, those auditing 100 or more public companies, to prepare an annual report and provide some explanations for their audit quality, efficiency, and transparency (Public Company Accounting Oversight Board, 2015).[1]

In 2014, the Center for Audit Quality, a professional organization established under the American Institute of Certified Public Accountants recommended that an 'audit quality report,' resembling a transparency report but being more comprehensive, be prepared (voluntarily) by audit firms (Center for Audit Quality, 2014). On the other hand, four major audit firms in the United States are already reporting and publishing transparency reports voluntarily. For example, Deloitte prepared its first transparency report in 2010 (Bedard et al., 2010).

In the specific context of Turkey, where the current study is based, transparency reporting regulation effective from 2012 requires that audit firms carrying out audit activities for PIEs report to Turkey's Public Oversight, Accounting and Auditing Standards Authority (KGK) via an annual report to be published on the KGK website. All KGK practices and implementations follow standards issued and later amended by the International Accounting Education Standards Board (IASB) as well as the EU Directive.

2.2 Continuing education disclosures of audit firms

To date, the most comprehensive regulatory mechanism of the sort is 'The International Education Standard' (IES) prepared by the IASB established under the International Federation of Accountants (IFAC). The IES underlines the significance of continuing education and development and pro-

1 See PCAOB No. 2011-007, 2013-009, 2015-004.

vides a list of competencies expected of accounting professionals depending on various levels of expertise. Specifically, the revised IES 3 (effective from 1 July 2015) titled 'Initial Professional Development' identifies such soft skills as 'professional skills' that include intellectual, interpersonal, and communication, personal, and organizational skills. This and other standards not only establish technical education and skill requirements for professionals but also point to a constructive alignment process incorporating non-technical (soft) skills or capabilities like values, attitudes, and ethics as complements to a traditionally narrow set of (largely numerical) accounting professionals' knowledge (Gammie et al., 2010).

Moreover, continuing education and professional capabilities are directly associated with audit quality as essential elements of independent auditing (Johl et al., 2021). The 'continuing professional development' concept in IES 7 of the standard guide is defined as a continuation of initial professional development, the learning and development through which aspiring accountants expand skills in the workplace in the first place and then move on to assume roles as professional accountants (International Federation of Accountants, 2019).

There are contextual differences as to an acceptable set of regulations and transparency report requirements for independent audit firms. There are also inter-country differences in the scope of information shared and in terms of the education policies of audit firms (Fu et al., 2015). The EU's framework directive stipulates that company information on continuing education policies is sufficient in a transparency report, while in Japan there is no emphasis on continuing education, and both Australia and Turkey expect audit firms to identify the amount, duration, and type of educational practices enacted. In the specific context of Turkey, audit firms are required not only to identify the educational practices of the audit firm but also to offer a summary of the education received by auditors themselves during the financial year in question.

2.3 A conceptual framework for soft skills and hypothesis development

Accounting professionals today are faced with a wider set of expectations; in addition to demonstrating their technical expertise, they also need to play an advisory role (Lim et al., 2016), a transformation that requires professionals to develop an increasingly enhanced and varied capabilities agenda (Bianchi et al., 2020). Interestingly, the expectations from professional audit firms fluctuate based on client company size. Studies show that small-sized auditing clients expect more than a financial statement audit from their auditors (Collin et al., 2017). In such a context where technical skills are considered commonplace and financial evaluation is taken for granted, the soft skills of auditors stand as an important evaluation criterion for audit firms, posing a particularly critical challenge when making hiring decisions in the case of, for example, auditors with limited experience (Lim et al., 2016). However, as an unfortunate obstacle to this expectation, small-sized audit firms have a comparatively limited budget for providing associated auditors with soft skills education and training (Chen et al., 2013; Svanström, 2016). Auditors' soft skills are consequential in relation to and positively correlated with various audit-related outcomes such as audit quality (Gul et al., 2013), the audit expectation gap (Enes et al., 2016), and ethics (Mohamed Saat et al., 2012). For the purpose of this study, soft skills are defined in the context of IFAC IES 3 and IES 4 standards as cognitive skills (such as intellectual capabilities), behavioral skills (such as leadership and motivation), integrative and multi-disciplinary skills (such as effective communication), and ethics, values, and attitudes. Soft skills lay the ground for and facilitate the activation of technical skills and are equally crucial to demonstrating professional competence of accountants. In their study investigating accounting graduates' perceptions of soft skills, Dolce et al. (2020) include a wide range of competencies spanning from operational to interpersonal, such as communication skills and teamwork. In the same study, the researchers argue that it is not very easy to define what constitutes a soft skill, and both 'soft' and 'skill' are used interchangeably with some other words like personal, transferable, personal, vocational for the former, and competencies, attributes, and capabilities for the latter.

According to emotional intelligence theory, soft skills are considered key to accounting professionals with various skills like teamwork and collaboration (Coady et al., 2017). Soft skills are one of the components of emotional intelligence (Baron, 2006; Mayer & Salovey, 1993), which is defined (Goleman, 2017) as the ability to effectively manage ourselves and our relationships with others. Sometimes conceptualized as 'people skills,' soft skills

also refer to the ability to effectively interact with or handle interactions with people (Borghans et al., 2014). Studies show that soft skills such as leadership, public speaking and writing cannot be sufficiently acquired at formal educational institutions, and thus education during a professional career becomes significant (Tan & Laswad, 2018; Rebele & Pierre, 2019; Berry & Routon, 2020). Soft skills have been associated with positive outcomes in terms of white-collar employees' career development and business performance (Cobo, 2013; Marques, 2013; Robles, 2012; Zhang, 2012). Evidence suggests that there is much to gain for businesses from an evaluation of their employees' current soft skills competencies while planning and structuring education programs (Chamorro-Premuzic, et al., 2010; Gibb, 2014).

In addition to limited use of transparency reports by auditors and regulators, there is limited literature on transparency reports given that transparency directives are relatively new and there is a lot of variation even in the practices of large audit firms (Fu et al., 2015; Girdhar & Jeppesen, 2018). This gap is particularly salient in terms of continuing education and soft skills-focused content. Typically, international studies on transparency reports predominantly investigate the relationship between transparency reporting and audit quality (Deumes et al., 2012; Pivac & Čular, 2012), the effectiveness and efficiency of audits (Pott et al., 2008), and investor behavior (Holt & DeZoort, 2009; La Rosa & Caserio, 2014). However, the findings of various studies have implications for continuing education, although it has not been considered as the main research topic in studies on transparency reports (Zorio-Grima & Carmona, 2019). According to La Rosa et al. (2019), continuing education of auditors contributes positively to investor confidence based on transparency reports of European audit firms. The obligation regarding a comprehensive disclosure of continuing education policies in transparency reports is crucial in terms of understanding the soft skills training preferences of audit firms, as is a piece of detailed information about the time they allocate to this training within the total training program.

Literature alludes to the time required for soft skill development and the creation of appropriate educational content (Gibb, 2014; Rebele & Pierre, 2019). Time spent on education has been evaluated as a critical indicator of efficiency of continuing education and soft skills acquisition (Raghunandan et al., 2003; Chen et al., 2008; Howcroft, 2017). Accordingly, Taylor et al.'s (2009) study endorsed the influence of the length of training on the effectiveness of managerial training. IFAC also states that within the International Accounting Standards, professional accountants may prefer a time-based and input-based approach (International Accounting Education Standards Board, 2019).

To that end, we sought to examine a selected set of transparency reports to address the following hypotheses:

Hypothesis 1a: Audit firms that are members of international networks spend comparatively more time providing soft skills/non-technical education than non-members.

Hypothesis 1b: Audit firms with higher levels of revenue spend comparatively more time providing education (both technical and non-technical) to their audit team members.

Hypothesis 2: There is a significant relationship between the duration of education given and audit revenue.

The main rationale for covering this specific period in the context of audit firms in Turkey is manifold:

As discussed under the regulatory framework, Turkey is among the few countries worldwide where this practice is mandatory. Moreover, in the specific context of Turkey, audit firms are required by the Audit Standards Authority of Turkey to accommodate an item in their transparency reports where they display their continuing education policies, including the education provided to their audit teams during the previous financial year. The specifics of continuing education practices displayed in those transparency reports are by implication an indicator of audit firms' long-term development initiatives, and they are part of corporate investment in human resources. As a mandatory policy requiring audit firms to provide detailed information about their continuing education practices in transparency reports, this article reflects the significance placed on education at the state level and creates a fruitful data set on which detailed analyses can be conducted and future theory and practice can be extrapolated.

As for the choice of the timespan, the data available for transparency reports, including educational practices, only date back to 2016. Turkey, a devel-

oping economy with a thriving entrepreneurial ecosystem where a comprehensive regulatory system is building up with accompanying accounting practices, is among the few countries where the release of transparency reports is mandatory by law. As such, there is room in Turkey for advancing the overall goal of improving audit firms' capabilities, and hence, improving the quality of accounting.

Finally, audit-related developments are nurtured in countries in the developed center, and they have repercussions for countries in the developing periphery, which makes research in the former more abundant, thereby creating a literature niche for relevant research. The transparency reporting practices are yet to be aligned even among European countries where the diversity is attributed to their disparate regulatory systems (La Rosa et al., 2019). Given that the KGK of Turkey is yet to publish a review of all existing transparency reports released in Turkey to provide working material on specific content like soft skills education, the current study offers preliminary findings on a neglected aspect of transparency reporting in the specific context of a relatively understudied context (Public Oversight, Accounting and Auditing Standards Authority, 2017).

3. Method

Since the regulation for audit firms to publish transparency reports was released in 2015 and became effective in 2016, we collected data from 2016 to 2018. As of 2016, the total number of audit firms that are authorized by the Public Oversight Accounting and Auditing Standards Authority of Turkey was 235, 249 and 273 in 2016, 2017 and 2018, respectively. We accessed transparency reports from a total of 56 firms in 2016, 62 in 2017, and 64 in 2018 through their websites. Despite conducting PIE audits and publishing transparency reports, 18 auditing firms in 2016, 18 in 2017, and 16 in 2018 did not disclose the duration or content of the education they provided in their reports, and hence, they were excluded from this study. In addition, firms that published single year transparency reports were also excluded from this study to ensure analysis accuracy. Ultimately, a total of 52 audit firms for which we had access to their data for the years 2017, 2018 and 2019, and whose data on the number of employees, education periods, and revenues we were able to fully access, were included in the testing of the research hypotheses.

Table 1 Descriptive statistics

International network membership	**%**
Member	46.15%
No membership	53.85%
Total number of audit employees	**#**
2016	2890
2017	3169
2018	3256
Audit employees 2016	**%**
<50	42.31%
>50	57.69%
Audit employees 2017	**%**
<50	40.38%
>50	59.62%
Audit employees 2018	**%**
<50	44.23%
>50	36.54%
Total revenue	**# (Turkish Lira)**
2016	₺574,634,772.28
2017	₺731,759,408.98
2018	₺817,384,603.58
Total revenue 2016 (₺)	**%**
<1,000,000	44.23%
1,000,000 – 10,000,000	44.23%
>10,000,000	11.54%
Total revenue 2017 (₺)	**%**
<1,000,000	34.62%
1,000,000 – 10,000,000	50.00%
>10,000,000	15.38%
Total revenue 2018 (₺)	**%**
<1,000,000	28.85%
1,000,000 – 10,000,000	53.85%
>10,000,000	17.31%

Source: Created by the authors

When collecting data, the topics of education and the education period reported by the firms in the sample were taken into account. Within this framework, a list of all educational content provided in

an accounting year was identified on a company basis, resulting in the following main subjects: Independence, Audit Standards, BOBI FRS (Large and Medium-Sized Enterprises Financial Reporting Standards), General Audit Topics, Ethics, Law, Quality, Corporate Governance, General Accounting Topics, Technology, Accounting and Financial Reporting Standards, Tax, and Management.

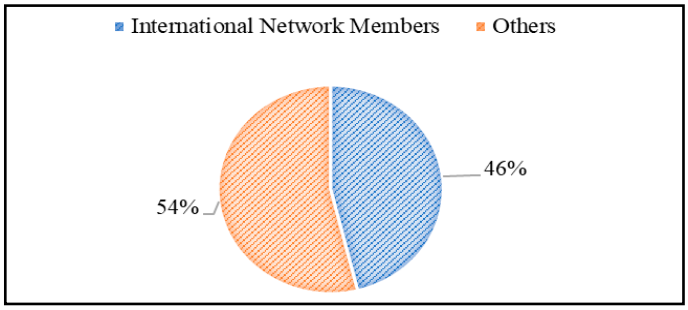
These topics were then categorized as either 'Technical Education' or 'Non-Technical Education.' The technical education classification included audit, accounting, law, and tax education received by the audit firms for professional subjects, while non-technical education included soft skills education like communication, leadership, teamwork, motivation, and stress management. The hypotheses were tested via IBM SPSS 24.0 analysis software based on data obtained from the 52 sample firms.

4. Results

4.1 Descriptive findings

As Figure 1 shows, 24 (46%) of the audit firms that have been examined are members of at least one of the international audit networks, and 28 (54%) do not have any such membership. International audit networks expect local audit firms to act in line with various central and overarching decisions across their corporate practices and policies, including education. Therefore, differences are expected in the educational preferences of these audit firms.

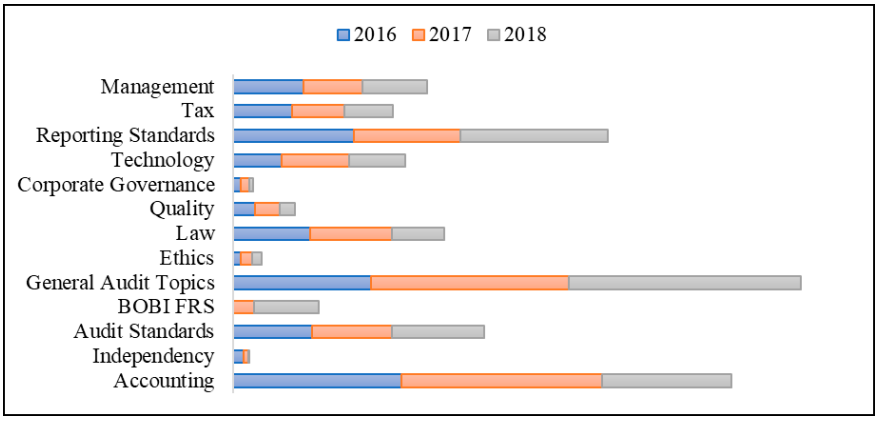
Figure 1 Network membership of audit firms



Source: Created by the authors

The distribution in Figure 2 occurs when the education received in the three years is evaluated within the scope of the classification described above. It can be seen in Table 2 that the audit firms provided a total of 29,874 hours of education in the three years.

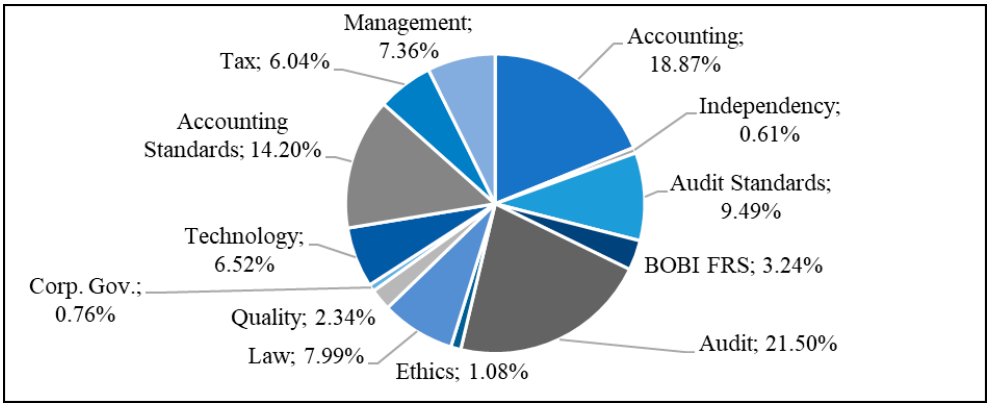
Figure 2 Classification of education received in terms of subjects



Source: Created by the authors

From 2016 to 2018, the total duration of education received increased by 13.96%. General accounting issues, general audit issues, and accounting and financial reporting standards were the topics that members were trained for during much of this period. Education in these three subjects accounted for 54.57% of the total education. Based on the data featured in Figure 3, the issues afforded the least education time are defined as independence (0.61%), corporate governance (0.76%), and ethics (1.08%).

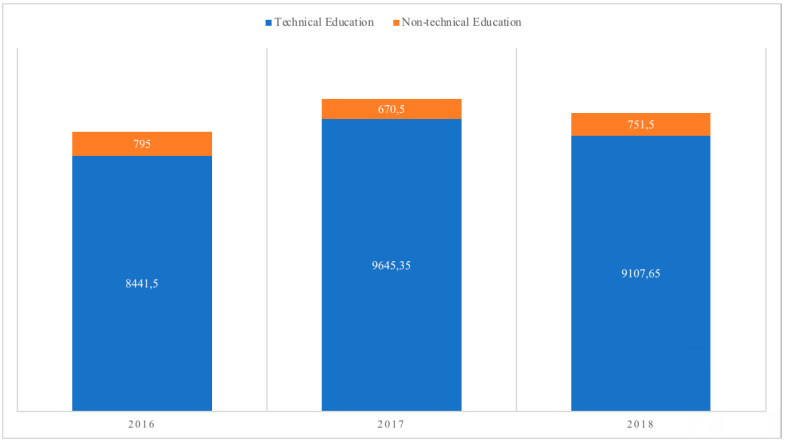
Figure 3 Percentage distribution of education topics received



Source: Created by the authors

Figure 4 displays education hours provided by the audit firms classified as technical and non-technical education. Firms allocated 93% of the total education time to technical education and only 7% to non-technical education.

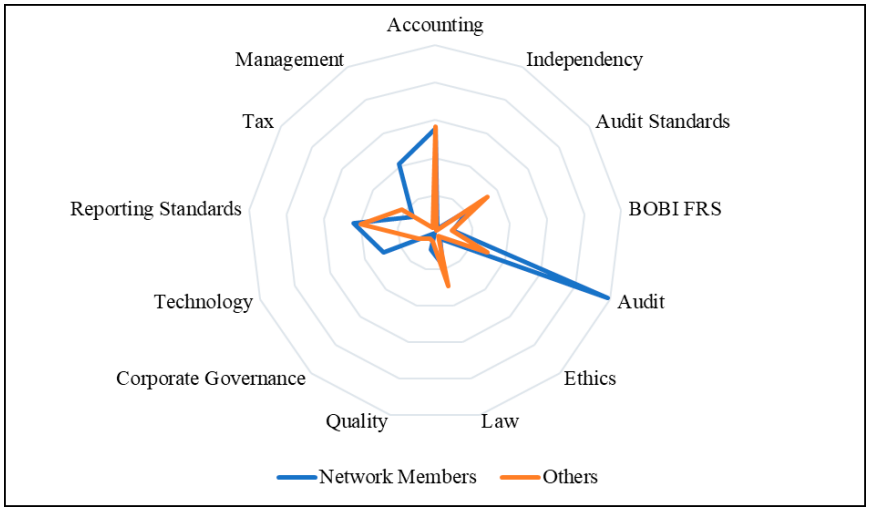
Figure 4 Distribution of technical and non-technical education hours



Source: Created by the authors

Based on the expectation that there might inevitably be differences in education strategies, duration, and content of local audit firms that are members of international networks, we tested for group differences. Figure 5 shows an evaluation of the three-year total education programs of member firms and non-member firms within the scope of educational content.

Figure 5 Education issues of international network member audit firms and other audit firms (total for 2016, 2017 and 2018)



Source: Created by the authors

As Figure 5 suggests, international network-affiliated audit firms rate audit, accounting, technology, and management more highly in terms of the scope of the total education period and educational content compared to non-member firms. Firms with no membership are more focused on accounting, independent audit standards and legal topics. The largest gap between the two groups was observed in audit education at an incredible high of 229.77%. Both groups focus significantly on general accounting and auditing topics. Meanwhile, both groups have the lowest proportion of corporate governance and independence during the total period of education.

4.2 Hypotheses testing

To test Hypothesis 1a, which reads "*Audit firms that are members of international networks spend comparatively more time providing soft skills/non-technical education than non-members.*", a chi-square test was performed. The chi-square test was used because both variables (network membership and non-technical education) are categorical. The chi-square test results can be seen in Table 2 as the Pearson chi-square value is 4.748, df is 1, and the significance (p) value is 0.029. The test results revealed that there is a significant relationship between the variables, namely non-technical education provided by the international network member audit firms and the non-network audit firms. Therefore, the H1a hypothesis was accepted.

Table 2 Cross table for network membership and non-technical education

Network membership		Non-technical education		
		Providing companies	Non- providing	Total
Network members	Number	11	13	24
	Expected number	7.4	16.6	24.0
	% in non-technical education	68.8	36.1	46.2
No membership	Number	5	23	28
	Expected number	8.6	19.4	28.0
	% in non-technical education	31.3	63.9	53.8

χ^2=4.748, df=1, p<0.05 (p=0.030)
Source: Created by the authors

The group of audit firms that are members of an international network provides a balanced level of non-technical education, whereas 82.1% of audit firms that are not members of any international network do not provide non-technical education. Some 68.8% of the audit firms providing non-technical education are members of an international network.

Before testing the H1b hypothesis, which reads *"There is a significant difference between the revenues of the audit firms that provide non-technical education and those that do not"*, a normality test was run for the revenue average variable. According to the results of the normality test performed on the revenue average variable (skewness = 3.214, kurtosis = 9.393), the data do not fit a normal distribution since they fall within a range of +2 and -2 standard deviation (George & Mallery, 2010). In other normality tests, the Kolmogorov-Smirnov and Shapiro-Wilk tests resulted in a p-value of 0.000; hence, we concluded that the data did not meet the assumption of normality.

We used both three years of average revenue data of firms and single-year data for 2016, 2017, and 2018 to identify a significant relationship between revenue and non-technical education practices of the firms. To test the H1b hypothesis, the Mann-Whitney U test was carried out and no significant relationship was found between the average revenue for three years, the individual revenues for three years, and the non-technical education status of the audit firms. This finding is contrary to our expectations in the hypothesis. Therefore, the H1b hypothesis was rejected.

Table 3 Independent-samples Mann-Whitney U test summary

Total N	52
Mann-Whitney U	215.000
Wilcoxon W	881.000
Test Statistic	215.000
Standard Error	50.438
Standardized Test Statistic	-1.447
Asymptotic Sig. (2-sided test)	.148

Source: Created by the authors

We performed Spearman's non-parametric correlation analysis for testing the H2 hypothesis, which assumes that there is a relationship between the average revenue in the last three years for the audit firms and the length of education provided per audit firm in the last three years. Within the framework of the results given in Table 4, the p-value was found to be 0.001; therefore, it was concluded that there is a positive and significant relationship between average revenue and average education, providing partial support for our claim. According to the analysis results, the H2 hypothesis is accepted.

Table 4 Spearman non-parametric correlation results

		Average revenue	Average education
Average revenue	Correlation coefficient	1.000	.457**
	Sig. (2-tailed)	.	.001
	Correlation coefficient	.457**	1.000
Average education	Sig. (2-tailed)	.001	.

Source: Created by the authors

5. Discussion and conclusions

This study investigated the interaction between continuing education practices of audit firms and some firm characteristics from a transparency disclosure perspective based on a soft skills framework. The findings of the study show that when audit firms are divided into two groups based on (non) membership in an international audit network, some forthcoming differences emerge regarding

corporate practices as international audit networks encourage, support, and implement various global education and competence development strategies. Audit firms that are members of international networks dedicate more time to non-technical, soft skills education within their education programs than do firms that do not have any membership. Audit firms that are members of international networks share more open, detailed, and relevant data in their transparency reports. A forthcoming rationale for this finding could be the promotion of education programs that international networks implement to meet various standards within the framework of quality and competencies for cultivating the 21st century accounting professionals. This finding provides justification for enhancing the internationalization strategies and global alignment of audit practices, which would, in turn, generate even more positive externalities, i.e., in the form of a more varied agenda of soft skills education.

Another hypothesis of this research referred to revenues and the time allocated to non-technical education, which the existing data could only partially corroborate. Within the context of our data here, it seems that the decision by audit firms to provide non-technical education is at least partly independent of the revenue they generate. This finding is contrary to our expectations based on the previous literature that small-sized audit firms would have a comparatively limited budget to allocate for educational expenditures (Svanström, 2016). In the case of this study's sample audit firms, there is still room for investing in non-technical skills development, which is not only limited by monetary concerns but by other factors yet to be considered (i.e., philosophy, vision, strategy, etc.).

We also argued in favor of an interaction between the revenues of the audit firms and their education periods, which found support through statistical test results. In this case, although there is no relationship between non-technical education and revenue levels, it is understood that the overall educational endeavors and revenues of the firms are positively related. This finding is in line with previous research on continuing professional education and financial performance relation in big firms (Chen et al., 2008) and a higher continuing education budget and revenue performance (Chen et al., 2013). Although the minimum mandatory education periods and subjects required by the audit personnel are determined under the continuing education regulation, different education periods of the audit firms in terms of the level of revenue above this threshold may cause differences in competence among teams in these firms in the long term.

Working on audit firms' transparency reports has been shown to provide a clear picture of the impact of transparency disclosures on various aspects of audit firms' practices, including audit quality, firm reputation, and effectiveness, according to previous research (Johl et al., 2021; Fu et al., 2015; Pott et al., 2008). The current study has focused on transparency report data to find evidence for the association between continuing education practices as reflected in transparency report disclosures with some audit firm characteristics including membership in international networks and firm revenue. The findings provide evidence for the link between the extent of internalization (which mostly goes in parallel with the size of the firm) and audit firms' commitment to providing more soft skills education to their members, in tandem with literature which argued support for the relation in the size of the firm and increasing levels of audit quality (Johl et al., 2021).

As to the limitation of this study, we could not access transparency reports of some audit firms through their websites. In addition, reports of some audit firms can only be found through extensive search of their company website. On the one hand, this lack of discoverability prevents transparency reports from achieving their goal, and on the other hand, it poses a limitation to the generalizability of our findings given that we are not able to work on a broader sample. We have also observed that our sample firms have divergent approaches to how to disclose information in their reports. Some audit firms comprehensively explain their continuing education in the form of subjects, duration, number of participants, and instructors, while others only give the topic of education or make a general statement informing that all necessary education was provided.

However, our study could provide an initial step in future studies exploring education practices that appear in transparency reports. Once a large body of research in the literature has been collected, it will also be possible to conduct meta-analytical studies to establish a holistic framework on the inclusion and exclusion criteria of transparency reports. It could be useful for future studies to conduct international comparative research involving audit firms from countries that require the sharing of educational information in transparency reports, such as Turkey. Finally, it could also provide useful information to conduct detailed analyses (via qualitative research methods) of the reasons why audit firms have relatively little interest in providing non-technical education despite all the evidence in its favor.

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IMPLEMENTATION OF CURRENCY INTERVENTIONS OF THE CENTRAL BANK OF ARMENIA WITH FINANCIAL DERIVATIVES

Abstract

Purpose: The main goal of the paper is to develop financial derivatives of the Republic of Armenia (RA) as hedging tools for foreign exchange risk management for financial organizations and other entities. The secondary goal is to substantiate the efficiency and expediency of the use of financial derivatives as alternative tools for the implementation of foreign exchange interventions of the Central Bank of Armenia (CBA).

Methodology: In order to evaluate the currency interventions carried out by the Central Bank of Armenia (CBA), the interventions and their impact were studied by applying causal-comparative analysis and synthesis methods based on the CBA and International Monetary Fund (IMF) data. The most efficient intervention tools were revealed as a result of such analysis. The forward prices were calculated based on the swap intervention data and using the principle of impossibility of arbitration.

Results: The present study substantiated that the application of a forward contract for difference can ensure the same goals like those pursued by foreign exchange interventions with no impact on foreign reserves and no need for sterilization.

Conclusion: It was proposed to divide the swap agreements used by the CBA into spot and forward, which will ensure the realization of the same goals along with engaging a large number of non-financial companies. At the same time, the application of a forward contract for difference during the implementation of foreign exchange interventions will lead to the development of the financial derivatives market and ensure the matching of foreign exchange cash flows received by businesses in different periods.

Keywords: Derivative financial instruments, foreign exchange interventions, foreign exchange reserves, financial risk management

1. *Introduction*

During the implementation of economic activity, many risks, including financial risks, are associated with changes in market prices of assets. Financial risk is greater for those companies that are exposed to foreign currency exchange, for example, capital investments, import or export, etc. Risks related to exchange rate fluctuations need to be recognized, monitored and managed, otherwise the investors and businesses will lose income and the country will lose investment.

To mitigate these fluctuations, the Central Bank of the Republic of Armenia (CBA) carries out foreign exchange interventions by buying or selling foreign currency in the foreign exchange market of the Republic of Armenia. Currency interventions carried out by the CBA can also adversely affect financial market stability and price regulation, thus creating another problem. In particular, currency interventions cause a sharp change in Armenia's foreign exchange reserves, change the reserve adequacy ratio (ARA metric) which may affect the country's international rating, and cause the money supply to change. That is, foreign exchange interventions in the spot market further affect the country's financial system and need to be "sterilized" using other monetary policy tools as repo/reverse repo, etc. It is obvious that the "sterilization" of currency interventions through other transactions causes additional costs for the CBA, and thus for society.

The purpose of the research is to identify the problems arising as a result of CB interventions and to propose the use of such financial instruments that will ensure the achievement of the same goals, excluding the emergence of new problems.

2. Literature review

In terms of real investment, according to Avdjiev et al. (2019), local currency devaluation and the appreciation of the US dollar have a negative impact on the level of real investment in developing economies. As noted by Banerjee et al. (2020), the most important element of GDP growth is investment, particularly by companies, but their level is directly affected by the exchange rate, its changes, which create additional risks for companies.

Foreign direct investment is an important indicator of economic development (Comes et al., 2018). According to Tocar (2018), foreign direct investment is a key factor in ensuring economic growth and technological development, particularly in market economies.

Upadhyaya et al. (2020) and Barseghyan & Hambardzumyan (2018) defined that exchange rate fluctuations negatively affect both long-term and short-term exports as a result of the investments of the economic entities engaged in those spheres.

As mentioned by Carroll et al. (2017), financial risks arising in particular from currency fluctuations incur losses for companies that force companies to refrain from investing. If the magnitude of foreign exchange fluctuations and consequent potential losses were known in advance, the potential investor could somehow plan for and/or demand a return that could offset possible losses from foreign exchange rate fluctuations. However, the problem is that the range of these fluctuations cannot be accurately predicted, which leads to uncertainty and increases the risk of subsequent activities. In the case of high risk, the investor may demand a higher return, which may offset the risk, or may refuse to invest at all.

In international practice, businesses use derivative financial instruments to hedge against financial risks. Bartram (2019) studied the activities of 6,896 non-financial companies operating in 47 countries around the world. According to Angela & Gabriel (2008), companies are able to control the impact of fluctuations in their exchange rate and interest rate fluctuations by hedging through financial derivatives. Moreover, Carroll et al. (2017) emphasize that company size is a factor significant for the use of interest rate derivatives, while it is not significant for the use of foreign currency derivatives. Currency fluctuations are considered as a possible factor in the use of currency derivatives (Raguideau, 2020). As mentioned by Sikarwar (2018), if companies do not use appropriate financial derivatives for hedging, then unforeseen changes in the exchange rate affect the return on equities and the value of the company as a whole. According to Szlązak (2016), the main way to reduce company's currency risk is to use derivative financial instruments. Gibson (2010) points out that the OTC derivatives market has become one of the most important segments of the financial market over the last thirty years. It ensures the reduction of investment risks, which are used by all sectors of the economy (Duc Hong et al., 2019).

Of course, central banks regularly carry out foreign exchange interventions, which aim to mitigate sharp exchange rate fluctuations. Upadhyaya et al. (2020) state that central banks from time to time intervene to mitigate exchange rate fluctuations. According to Moreno (2005) and Indonesia (2019), a central bank intervenes in the foreign exchange market in order to mitigate exchange rate fluctuations, ensure the liquidity of the foreign exchange market, and change the level of foreign exchange reserves.

As mentioned by Patel et al. (2019), there are several ways for evaluating the foreign exchange reserve level for the country. The IMF declares 4 indexes (Ratio of reserve/ARA metric, Reserves/Broad Money, Reserves/Short-term Debt (STD), and Reserve/(Import/12)) for a country's reserve adequa-

cy, which can be used to assess reserve adequacy and other financial indexes of countries. Foreign exchange interventions by central banks, which change the level of foreign exchange reserves, may affect the published indicators. Therefore, inappropriate change of currency's reserves can have a negative impact on the country's financial performance.

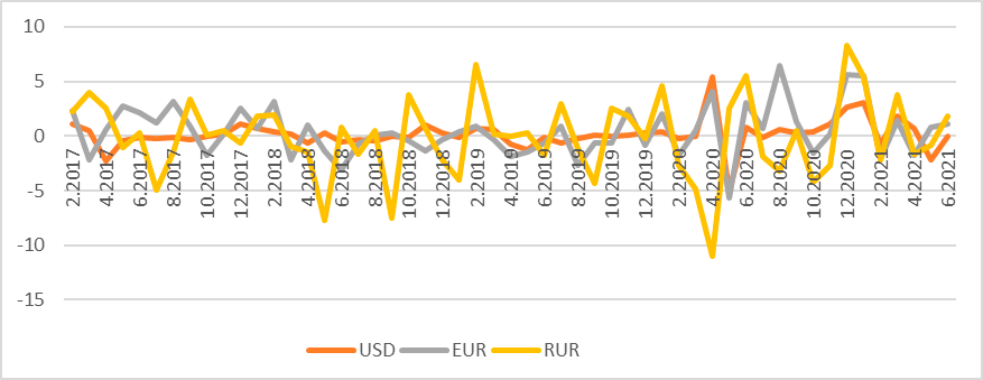
3. Data and methodology

International professional literature, scientific articles, research publications, internet data and publications have been used as a theoretical, informative and methodological basis for the study. Based on the purpose and direction of the article, the causal-comparative method was used. In addition, the methods of scientific analysis, synthesis, generalization and qualitative reasoning were applied at the empirical and the theoretical level. The interventions carried out by the CBA on the RA foreign exchange market and the impact of these interventions on foreign exchange reserves and other financial indicators were identified by applying positive and normative analysis. The impact of these interventions, the possibilities of using alternative instruments on the financial market and the possible effects on the exchange rate, liquidity, reserve level, as well as the need to sterilize the negative impact of the interventions were studied. For the analysis of the research, a study of international scientific publications was carried out with the aim of identifying the relevance of the topic, as well as the urgency of taking appropriate measures by the governments and policy makers of different countries. The source of research information was the publications of the International Monetary Fund (IMF), the World Bank, the Bank for International Settlements (BIS), the CBA and other relevant international and local organizations.

4. Analysis

To study the impact of exchange rate fluctuations, it is necessary to consider the volatility of the exchange rate of the US dollar, the euro and the Russian ruble, since the Armenian economy has mostly economic relations with investors interested in those currencies. During the last 5 years, the exchange rate of the US dollar has changed about 0.8% per year on average during the observed period, but the exchange rate has changed about +/-5% on a monthly basis, which means that depending on when to invest and when the repayment of interest and investment was made, an investor's income can change up to 5% on a monthly basis, and on a daily basis this change can be much higher. The problem becomes more significant for investors who register their assets in euro (EUR) or in rubles (RUR), since in the case of these currencies, an investor's cash flows in euros can change on a monthly basis by +/-6.5% on average, and in the case of ruble +/-11%. Such a change in the amount of cash flows received for foreign currency investments can have a significant impact on investment decisions, especially if we take into account that the current rate of return on investment is quite low. In the event that there is a probability of losing some amount from the investment, the investor should demand an appropriate compensation, which may be reflected in an increase in interest rates .

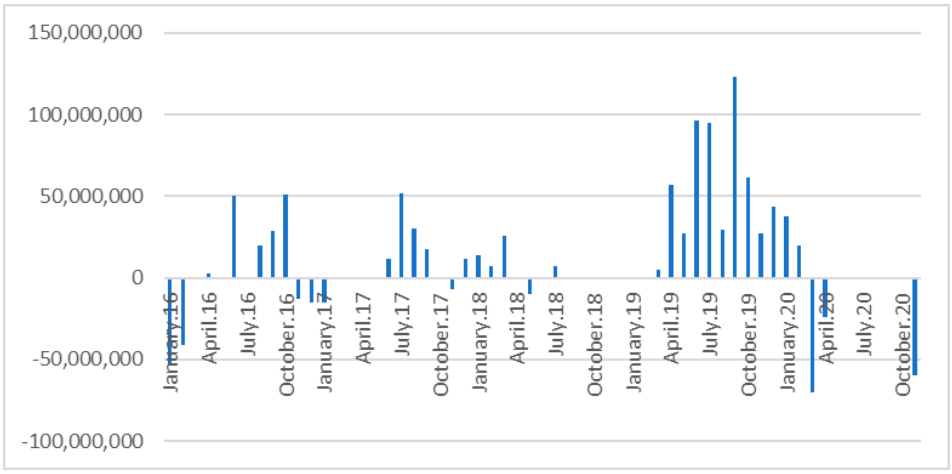
Figure 1 Monthly exchange rate fluctuations of US dollars, Russian rubles, and Euros, 2017-2021/06, expressed in percentage



Source: Calculated and compiled by the author (data source: Central Bank of Armenia - www.cba.am)

In order to mitigate exchange rate fluctuations, the CBA regularly implements currency interventions that affect the amplitude of exchange rate fluctuations.

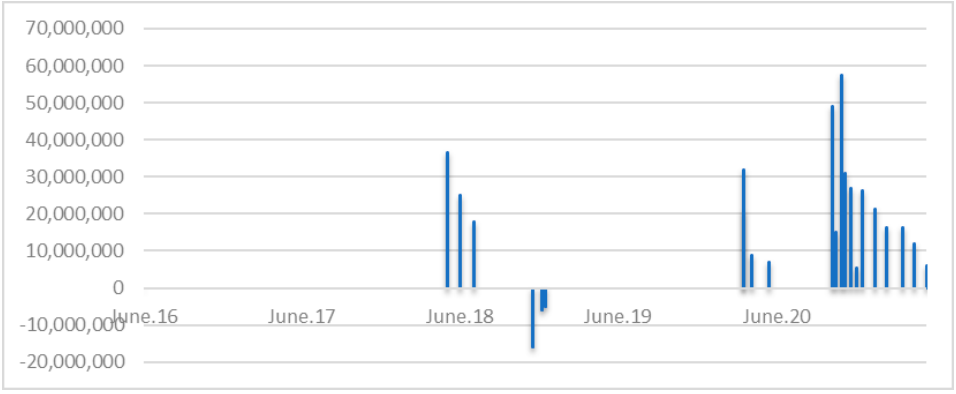
Figure 2 Intervention of the CBA in the spot currency market 2016-2020 (USD)



Source: Composed by the author (data source: Money Market - http://moneymarket.am)

Interventions with swap instruments are an alternative to the interventions carried out by central banks in the cash market. Archer (2005) states that central banks in developing countries conduct 82% of their currency interventions through the spot market. Based on surveys of 22 central banks in developing countries, Patel & Cavallino (2019) note that 85% of the total volume of interventions in 2012 was in the spot market, and in 2018, their share decreased to about 78%. That is, the share of derivative financial instruments is growing slowly but surely. The CBA conducts regular interventions, mainly by concluding transactions on the cash market, and sometimes uses swap agreements.

Figure 3 Swap transactions of the CBA for 2016-2021/05 (USD)



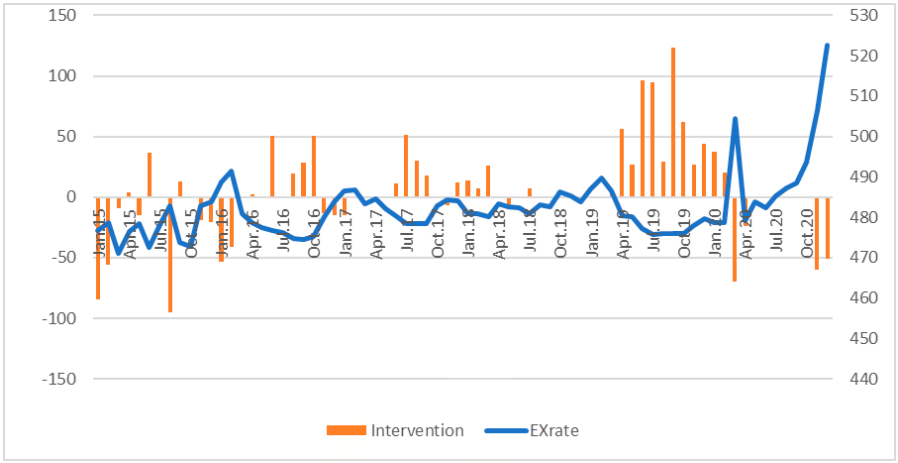
Source: Composed by the author (data source: Money Market - http://moneymarket.am)

It can be seen from the diagram that the CBA mainly reduced foreign exchange liquidity on the foreign exchange market by carrying out foreign exchange swaps. Foreign currency swaps are organized on the principle of repo agreements, attracting foreign currency at a fixed exchange rate, with the condition of future return and payment of fixed interest.

The study of the volumes of swaps shows that they are not performed regularly. For example, in 2019, swaps did not take place at all, and in 2020-2021, the CBA attracted foreign currency and reduced market liquidity. In terms of cash interventions, in 2018 and in 2019, the CBA bought net USD 44 million and USD 565 million, respectively, while in 2020, it sold USD 36.1 million.

In any case, it is obvious that the interventions carried out by the CBA have an impact on foreign exchange rates.

Figure 4 Foreign exchange interventions of the CBA and the USD/AMD exchange rate 2015-2020

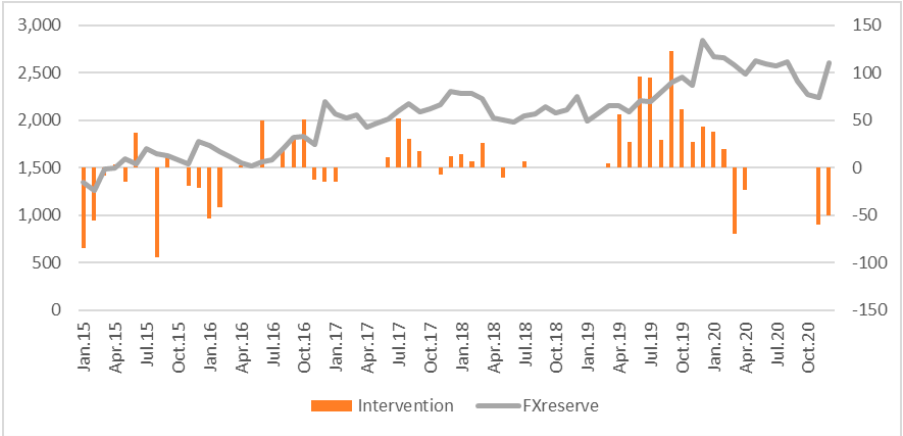


Source: Composed by the author (data source: Money Market - http://moneymarket.am and the Central Bank of Armenia - www.cba.am)

The Central Bank of Armenia carried out interventions in the foreign exchange market, the volumes and impact of which on the US dollar exchange rate are also presented in the IMF Country Report No. 21/273.

The interventions implemented by the Central Bank may affect other economic indicators, which may have negative effects. In order to avoid such negative effects, central banks implement sterilization, which requires additional efforts and actions. As a result of foreign exchange interventions, central banks use foreign currency reserves. The interventions carried out by the CBA affect foreign exchange reserves of the country, because reserves increase or decrease sharply during the interventions.

Figure 5 CBA interventions and FX reserves 2015-2020 (million USD)



Source: Composed by the author (data source: Money Market - http://moneymarket.am and the Central Bank of Armenia - www.cba.am)

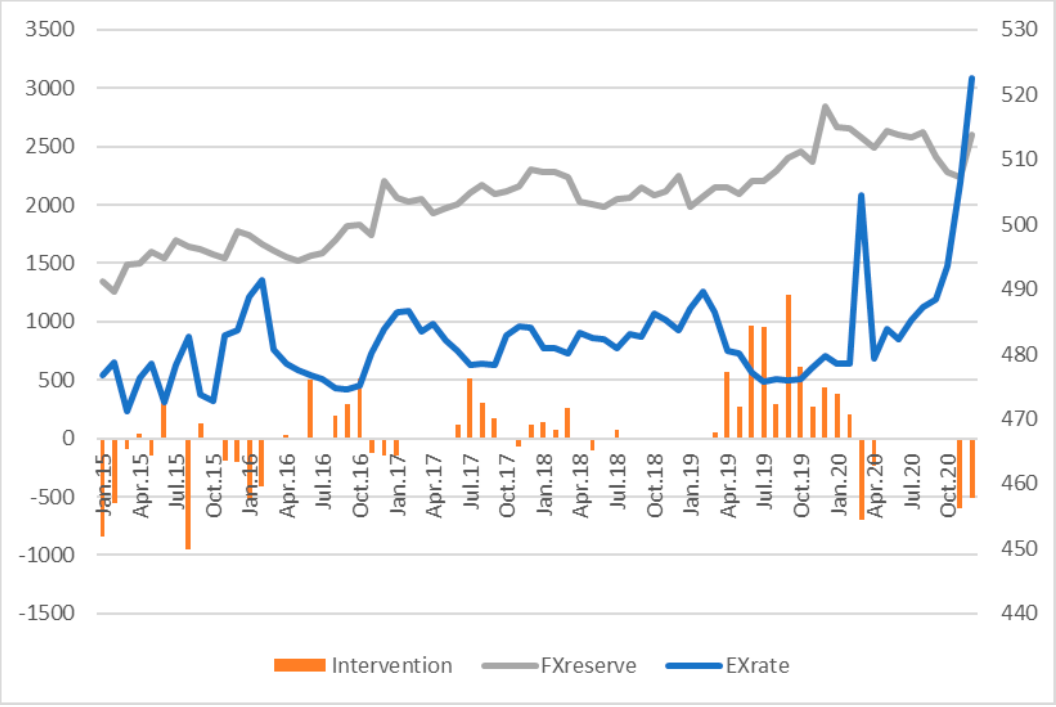
The level of foreign exchange reserves and its change can have a positive or negative impact on the credit rating of the country, which in turn affects the cost of financing from external sources (government or private) and the ability to withstand external shocks to the economy. At the same time, maintaining foreign exchange reserves requires costs (including alternative costs) associated with investing in low-yield assets.

Central banks have disagreements about the tools of intervention and their publicity, which stems from the purpose of the interventions. This is explained by the effect of central bank interventions on the exchange rate and the effect of publicity on the expectations of market participants, and thus on the present and future exchange rate (Nedeljkovic & Saborowski, 2019). From the above, it can be concluded that the ability to influence the expectations of market participants is an important factor in the process of influencing exchange rate fluctuations.

As mentioned by Patel & Cavallino (2019), the main medium-term goal of central bank intervention is to mitigate exchange rate fluctuations, influence exchange rate levels, ensure market liquidity, and limit the impact on international investment.

CBA interventions can be compared with the level of foreign exchange reserves of the RA, in order to get an idea about the impact of CBA interventions on the foreign exchange market and on the level of the country's foreign exchange reserves.

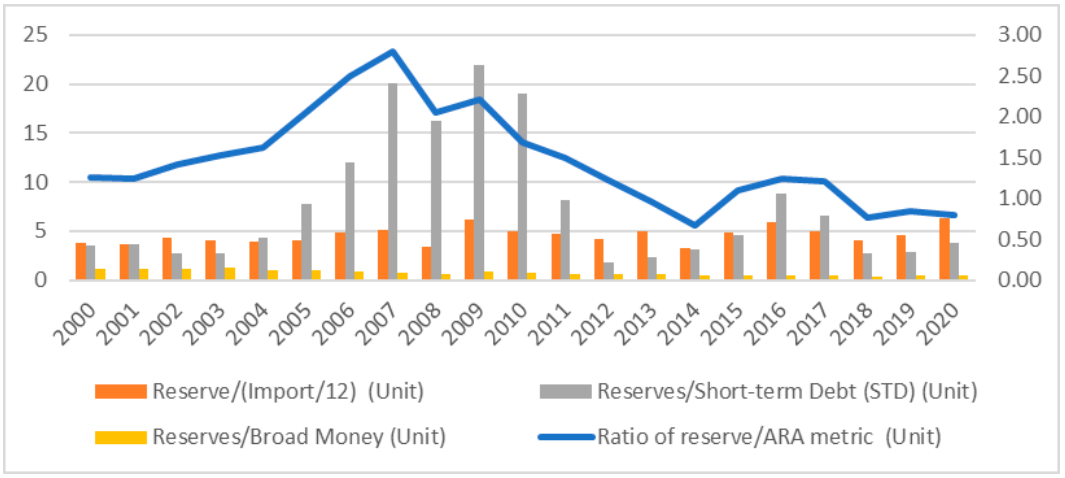
Figure 6 CBA Interventions, the USD/AMD exchange rate and RA foreign reserves 2015-2020



Source: Composed by the author (data source: Money Market - http://moneymarket.am and the Central Bank of Armenia - www.cba.am)

The IMF published four indicators to assess foreign exchange reserves of the countries. One of the most important indicators published by the IMF is the reserve adequacy ratio (ARA metric), which assesses a wide range of risks associated with the capital outflows reflection in the balance of payment (Arslan & Cantú, 2019).

Figure 7 Foreign reserve ratios of the RA 2000-2020



Source: Composed by the author (data source: the International Monetary Fund - https://www.imf.org)

It can be seen from the graph that the ARA metric of the RA reserves (assessment of reserve adequacy) is about 0.8, which is significantly lower than the level of the benchmark (1-1.5). It is obvious from the diagram presented above that the CBA should be careful when using reserves, or it would be more expedient not to use foreign exchange reserves for interventions.

Financial derivatives can be alternative tools during foreign currency market intervention. The development of the derivatives market can give an opportunity to intervene without using foreign exchange reserves. The use of derivatives by the CBA can have a positive impact on both the mitigation of exchange rate fluctuations and market liquidity. The CBA can influence foreign exchange rate fluctuations, without significantly changing the reserve level. In order to mitigate exchange rate fluctuations, it is more appropriate to carry out currency interventions publicly, as the central bank will also have the opportunity to influence the expectations of market participants. A variety of intervention tools can be used for market interventions (sterilized or non-sterilized) in accordance with monetary policy of the CBA, which may affect the situation on the financial market or, conversely, have no effect at all.

Table 1 compares the possible impact of tools (cash and derivatives) used by central banks for currency interventions in the exchange rate, market liquidity, foreign exchange reserves, and the necessity to make other interventions to sterilize the negative impact of foreign currency market intervention.

Table 1 Currency intervention tools and their impact

Tool	Application	Impact			
		Smoothing currency rate fluctuations	**Providing liquidity in the foreign exchange market**	**Saving foreign exchange reserves**	**Excluding the need for sterilization**
Currency foreign exchange deals	CB buys or sells foreign currency	Yes	Yes	No	No
Combination of foreign exchange spot transactions with forwards	CB buys/sells on the foreign exchange spot market and sells/buys on the forward market	Yes	Yes, temporarily	Yes, temporarily	No
Currency swap	CB exchanges currency under the condition of future exchange	Yes	Yes, temporarily	Yes, temporarily	No
Forward contract for difference (CFD)	CB buys/sells currency forward, the final settlement of which is made in local currency.	Yes, as it effects the expectations and supply or demand	Yes, as it effects expectations and supply or demand.	Yes, currency is not paid	Yes, as the differences are not as big as the entire contract

Source: Compiled by the author

As already mentioned above, in order to regulate foreign exchange rate fluctuations, the CBA mainly uses cash intervention and sometimes foreign exchange swaps. Swaps are used in the RA by the repo principle, i.e., buy or sell on spot market and sell or buy in the future with the payment of a certain interest.

Swaps are widely used tools in financial markets that are still evolving, which is why they appear in new forms. But at the same time, swaps are quite complex instruments unlike other derivative financial instruments and require a lot of experience and knowledge, especially if we consider that swaps are a combination of several forward contracts (according to another approach, a swap is a combination of two bonds, one of which is long and the other is short). This is the main reason why non-financial companies are not interested in this tool. As we can see from the table, the use of swaps solves the problem of exchange rate fluctuations, liquidity and reserves, but temporarily, because at the end of the swap period the party has to trade in the cash market to fulfill the obligations under the swap agreement. Swap agreements concluded by the Central Bank of the Republic of Armenia have a period of 1-2 months, which implies that the situational tension in the foreign exchange market is postponed for the period defined by the swap agreement. If the tension in the currency market is not eased by the end of the swap, the Central Bank of Armenia can only offer one more swap and so on. In any case, the regulation of the situation in the market is set and still remains on the country's foreign exchange reserves. As an alternative, forward contracts can solve the problem of reducing currency risks in the same way, because as mentioned above, a swap is a set of several forwards. In addition, the table shows that the combination of spots and forwards and the use of swaps have the same effect on the selected indicators. A cash transaction solves the problem of reducing exchange rate fluctuations and market liquidity at the moment, and the presence of a forwards ensures the replenishment of reserves on an accrual basis, and forwards also regulate the demands of market participants, which are based on expectations.

As we can see from the given table, the CBA can get the same result both by using swaps and by combining cash and forwards. But what is the difference between using these two tools and what perspectives do forward contracts provide? Swaps are concluded and traded exclusively in the inter-

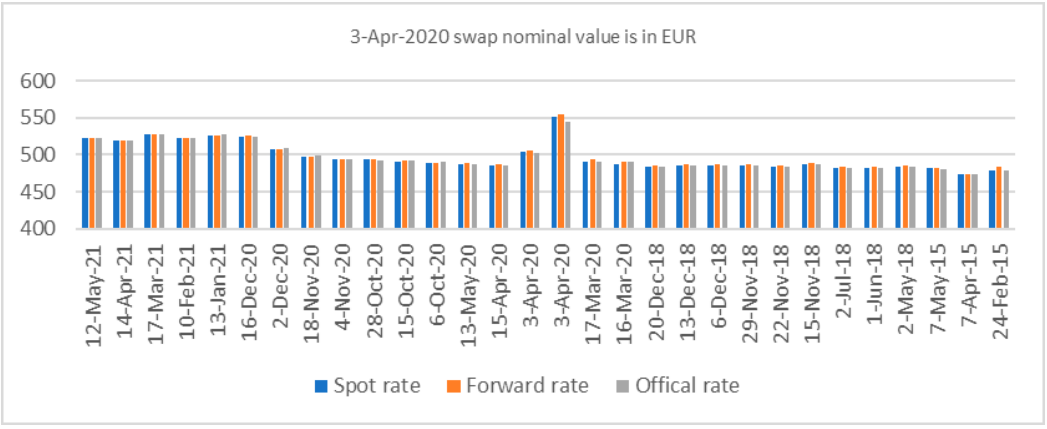
bank market, and in the case of a combination of cash and forward transactions, a forward contract concluded on the interbank market can be resold to the bank's customers, as a forward contract is more accessible and understandable to non-financial participants. The emergence and development of such a market will ensure that businesses enter into transactions in the forward market to hedge their future cash flows. At the same time, a new financial instrument will appear in the financial market, which can become a separate subject of buying and selling and which can activate the financial market, attracting new participants from the non-financial sector, who expect future foreign exchange inflows and want to fix the exchange rate.

Another option are forward contracts for difference. Forward contracts based on difference create new opportunities. In this case, the final settlement will be made in cash AMD, foreign exchange reserves will not change at all as a result of those interventions and there is no need to sterilize the consequences of the intervention. Forwards can be concluded for the period of three or six months, but also for any other period, which will smooth out time inconsistencies in foreign exchange flows. Forwards are simpler than swaps, and they are more visible to businesses. Of course, the CBA does not have direct transactions with non-financial organizations; in this case, commercial banks can be intermediaries between non-financial organizations and the CBA. As can be seen from the table below, the swap tool does not affect foreign exchange reserves only temporarily, since it assumes return of foreign currency injected into the forward market, which may create a new demand for foreign currency, which can be alleviated only by selling or buying foreign currency from reserves or by creating new swaps. At the same time, by quoting the prices of forward contracts, the CBA will encourage leading banks to carry out appropriate quotations and involve non-financial organizations in the derivatives market. By including non-financial organizations in this market, it will be ensured that over time the foreign exchange inflows of the economy are adjusted through market mechanisms without the participation of the CBA.

It is also possible to develop a forward market with cash settlement. These tools also have no impact on foreign exchange reserves and their use allows to mitigate exchange rate fluctuations. This tool can never show the need for sterilization. However, the use of this cash settled forward is more efficient for market participants in the sense that the absence of foreign exchange transfers during the execution of forward contracts allows the parties to the transaction to reduce operating costs associated with the supply of foreign currency. The use of simpler types of derivatives by the CBA will contribute to the development of this market.

The study of swap transactions of the CBA shows that the CBA has and can offer a forward price to the market. When determining the forward exchange rate, the Central Bank may apply the no-arbitrage principle. Based on data of swap contracts implemented by the CBA, forward exchange rates were calculated using the no-arbitrage principle. The forward price of the US dollar calculated on the basis of swap market interventions is presented in the following graph .

Figure 8 Forward rate calculated according to swap 2015-2021



Source: Calculated and compiled by the author

The announcement of such a price would give greater strength to currency interventions, inform market participants about the future market situation and form certain expectations for the future. Most importantly, however, participants would have the opportunity to hedge their financial risks by signing forwards. In addition, in order not to suffer losses due to price fluctuations, some participants may execute a future transaction now, increasing market tension. The separate use of a forward as a financial instrument affects the expectations of market participants, allows them to hedge their risks and reduce their participation in increasing the tension in the foreign exchange market.

5. Conclusion

The development of the financial derivatives instrument market has great importance for the financial markets. Derivatives not only serve as an effective hedging tool for businesses operating in different sectors of the economy, but also provide information about the future market situation and expectations of market participants, increasing the efficiency of the financial market. Scientific studies show that a developed derivatives market allows businesses to agree on their future plans, secure their future supply or acquisition of any assets and eliminate future uncertainties.

The paper examines the interventions carried out by the CBA in the foreign exchange market, revealing their impact on the exchange rate and market liquidity. In addition, the study reveals the impact of foreign exchange interventions on the country's foreign exchange reserves, whose compliance is at a low level (ARA metrics ratio 0.8), while the benchmark level set by the IMF should be 1-1.5, which affects the country's creditworthiness level and the cost of attracting public and private sector loans. This is why the saving of foreign reserves during the implementation of currency interventions is of vital importance for the country's economy. To this end, the following recommendations have been implemented and substantiated:

1. Swap agreements implemented by the CBA can be divided into two parts: spot and forward. Having a separate forward contract will allow market participants to circulate it independently by forming a derivatives market, where they can hedge their financial risks, form expectations and avoid future uncertainties.
2. The existence of forward contracts and their independent circulation will enable the easing of tension in the foreign exchange market, the influence on the expectations of market participants, as well as the inclusion of future foreign exchange businesses flows in current transactions.
3. The use of forward contracts for difference (CFD) during the implementation of currency interventions will help the CBA to save the country's foreign exchange reserves and exclude drastic changes in the level of foreign reserves, as well as not cause the need for sterilizing the negative consequences of foreign exchange interventions by using other monetary policy tools.

The analysis presented in this article has some limitations. Although graphical analysis of the data provides an insight into the expressive relationship between the variables, it is possible that the changes in the exchange rate and the level of currency reserves are related to other variables, especially the balance of trade and payments, the state of the activity of borrowing money from foreign markets, etc. Due to the lack of data, the studied indicators were considered on a monthly basis in the last 5 years. For greater efficiency, it is necessary to study a longer period based on daily data.

The research results are useful for businesses that may need to avoid foreign exchange risks by using derivatives, and for financial market regulators or policy-makers.

Future research can assess the impact of interventions on the exchange rate and foreign exchange reserves, the impact of the level of reserves on the rating of the country by creating a linear regression model, which will enable the justification of the need to save reserves during the implementation of interventions. In addition, future research could explore the feasibility of using a forward contract for difference or other derivatives to mitigate exchange rate fluctuations without the need to sterilize the consequences of interventions.

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THE EFFECT OF MEASURING DERIVATIVE FINANCIAL INSTRUMENTS ON THE FINANCIAL POSITION AND PROFITABILITY - THE CASE OF BANKS IN CROATIA

Abstract

Purpose: The purpose of this paper is to determine whether the effects of measuring derivative financial instruments affect the financial position and profitability of banks operating in the Croatian banking sector.

Methodology: The survey covered all banks in Croatia that recognized derivative financial instruments in their financial statements in the period from 2017 to 2020. Descriptive statistical methods and correlation analysis were used to determine the impact of measuring derivatives on the financial position and profitability of Croatian banks.

Results: The results of the research showed that banks that recognized the effects of measuring derivative financial instruments in their financial statements make up more than 80% of total assets of the Croatian banking sector. The share of the effects of measuring derivatives in total assets of banks that have recognized these effects is less than 0.5%. The results of the research also showed a medium-strong positive correlation between derivative financial assets and total bank assets and a medium-strong negative correlation between derivative financial liabilities and total bank assets. Furthermore, the results showed a weak positive correlation between derivatives and return on assets (ROA) and a weak negative correlation between derivative financial liabilities and ROA.

Conclusion: The effects of measuring derivatives are recognized mainly in the financial statements of large banks. The results of the research showed that the effects of measuring derivative financial instruments did not have a more serious effect on the financial position and profitability of Croatian banks in the period from 2017 to 2020.

Keywords: Derivative financial assets and liabilities, financial position, profitability, banks, Croatia

1. Introduction

Derivative financial instruments are a special type of financial instruments whose value depends on the value of the underlying variable such as the market value of a debt or equity financial instrument, the price of other assets, the interest rate, the value of the stock index, etc. (Ramirez, 2007, p. 7). Derivative financial instruments were originally designed to manage risk exposure and were originally introduced to the Chicago Mercantile Exchange back in 1972 (Pilbeam, 2005, p. 334; Brealy et al., 2004, p. 640). Since then, the market for derivative financial instruments has been growing rapidly and has had a constant growth trend in the last 20 years (Bank for International Settlement, 2022). In today's globalized financial market, there are different types of derivative financial instruments, but in general, there are four main types of derivative financial instruments, and these are futures, terms, options and swaps (Brealy et al., 2004, pp. 640-679; Pilbeam, 2005, pp. 334-431). Each derivative financial instrument is primarily designed to provide protection to business entities from a particular risk, although it may also be used for speculative purposes (Brealy & Myers, 2003, p. 773). The large use of derivative financial instruments in the business sector has caused the need to set appropriate criteria for their recognition and measurement in the financial statements of business entities. Therefore, the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) in the United States have developed an accounting framework for the recognition and measurement of derivatives. The first International Accounting Standard to define the accounting framework for derivatives at the international level was International Accounting Standard 39 - Financial Instruments: Recognition and Measurement (IAS 39). IAS 39 defined general criteria for the recognition and measurement of derivatives, but also specified a specific accounting framework for derivatives defined as a hedging instrument. Because the criteria for applying hedge accounting were too complex and based on rules under IAS 39, many entities did not apply hedge accounting. Therefore, the effects of the entity's risk management activities are not properly presented in the financial statements (International Accounting Standards Board, 2014, p. 25). To improve the accounting framework for financial instruments in general, and hedge accounting in particular, the IASB developed International Financial Reporting Standard 9 - Financial Instruments (IFRS 9), which replaced IAS 39 and imposed criteria based on the principles of hedge accounting. Therefore, the current recognition criteria and methods for measuring derivatives are defined in IFRS 9. Because the implementation of hedge accounting is complex, "IFRS 9 permits an entity to choose as its accounting policy either to apply the hedge accounting requirements of IFRS 9 or to continue to apply the hedge accounting requirements in IAS 39" (International Accounting Standards Board, 2014, p. 25).

Derivative financial instruments are widely used in the banking sectors, especially in developed countries. Previous studies have shown that in EU countries, derivative financial instruments are widely used in the banking sectors of developed EU countries, while their use in EU developing countries is very low (Türel & Türel, 2014, p. 171; Huian & Apostol, 2014, p. 74). Therefore, the effects of measuring derivatives significantly affect the financial position of banks in developed EU countries, but do not have a significant impact on the financial position of banks in developing countries (Türel & Türel, 2014, p. 171). The main objective of this paper is to investigate whether the effects of measuring derivatives affect the financial position and profitability of banks in Croatia. In addition, this paper aims to investigate the extent to which derivative financial instruments are used in Croatian banks, which derivative financial instruments are most commonly used in Croatian banks, the purpose of using derivatives in Croatian banks and the correlation between the effects of measuring derivative financial instruments and the financial position and profitability of Croatian banks. The research covers the period from 2017 to 2020. Based on the objectives of the research, three hypotheses are set:

H1: The effects of measuring derivative financial instruments affect the financial position of banks in Croatia.

H2: There is a strong or medium-strong correlation between the effects of measuring derivative financial instruments and the financial position of banks in Croatia.

H3: There is a strong or medium-strong correlation between the effects of measuring derivative financial instruments and the profitability of banks in Croatia.

Descriptive statistical methods and correlation analysis are used to achieve research objectives and test research hypotheses. The data required for the survey were collected from publicly published annual reports of banks in Croatia.

2. Theoretical framework and literature review

2.1 Recognition and measurement of derivative financial instruments

Under IFRS 9, a derivative financial instrument is recognized in the accounting ledgers and a statement of financial position (a balance sheet) "when, and only when, the entity becomes party to the contractual provisions of the instrument" (IFRS 9, 2022, p. A365). A derivative financial instrument may be recognized in the statement of financial position as a derivative financial asset or derivative financial liability depending on the terms of the contract and changes in its fair value between the two reporting dates. A derivative financial asset is derecognized "when, and only when, the contractual rights to the cash flows from the derivative financial asset expire", or when the derivative financial asset is transferred to another entity, i.e. when all the risks and rewards of ownership of the derivative have been transferred (IFRS 9, 2022, p. A367-A368). A derivative financial liability is derecognized "when, and only when, it is extinguished - i.e. when the obligation specified in the contract is discharged or cancelled or expires" (IFRS 9, 2022, p. A372).

A single derivative financial instrument (and an embedded derivative that is separate from the host contract) is generally classified as a financial asset or liability at fair value through profit or loss and is initially measured at fair value excluding transaction costs (IFRS 9, 2022, p. A378). Subsequently, an individual derivative financial instrument is also measured at fair value, and the difference between the fair value at the reporting date and the initial fair value (carrying amount) is recognized in profit or loss (IFRS 9, 2022, p. A385). Because changes in the fair value of a derivative are recognized in the financial statements, they may have a material effect on the entity's financial position and performance.

Derivative financial instruments designated as hedging instruments in all types of hedge accounting are also measured at fair value at both initial recognition and subsequent measurement. Changes in the fair value of derivatives in fair value hedges are recognized in profit or loss, except in those hedging relationships in which the hedged item is an equity instrument measured at fair value through other comprehensive income. In these hedges, changes in the fair value of derivatives are also recognized in other comprehensive income (IFRS 9, 2022, p. A393). Changes in the fair value of derivatives in cash flow hedges and hedges of net investments in foreign operations are recognized in equity if the hedge is determined to be highly effective while the ineffective portion of the gain or loss on the hedging instrument is recognized in profit or loss (IFRS 9, 2022, pp. A394-A395).

The measurement of derivatives can seriously affect the financial position and performance of the entity, especially in banks and other financial institutions where financial instruments make up a significant part of total assets (Perčević & Gulin, 2012).

2.2 Review of previous studies

Derivative financial instruments have been the subject of numerous studies since their initial appearance. There are many studies that have investigated the use of derivatives and their impact on the financial position and operations of banks. Brewer et al. (1996) found that the use of derivatives in depository institutions has a positive effect on their financial performance (Brewer et al., 1996, p. 495). de Peretti & Keffala (2002) investigated the effect of the use of derivatives on accounting risk in banks in emerging and recently developed countries. They concluded that "in general, the use of forwards and swaps decrease bank risk while the use of options positively affects bank risk, and finally the use of futures has a mildly significant effect on bank risk" (de Peretti & Keffala, 2002, p. 49). Keffala et al. (2013) also investigated the impact of the use of derivatives on bank performance in developing and recently developed counties and identified the negative impact of derivatives on bank performance in such countries (Keffala et al., 2013, p. 2). Türel & Türel (2014) conducted a comparative analysis of the effect of derivatives on the financial position of banks in Turkey and the EU and concluded that "the reported fair values of derivatives on the balance sheet have a considerable impact on the financial positions of the banks in the EU", but "have no significant effect on the financial position" of banks in Turkey because the total volume of transactions with derivatives in Turkish banks is very low (Türel & Türel, 2014, p. 185). However, a later study showed that the use

of derivatives in the Turkish banking sector is increasing (Çıftcı, 2020, p. 311). These results on the use of derivatives in banks in developing countries were corroborated by a study conducted among the banks in Romania (Huian & Apostol, 2014, p. 82). A study conducted in the banks in Hungary showed that the use of forwards, futures and swaps tends to slightly increase liquidity risk, leverage and credit risk, while options negatively affect leverage, liquidity and credit risks in Hungarian banks (Toth, 2014, p. 698). Efanga et al. (2019) "examined the impact of derivative instruments on risk management in the Nigerian banking sector between 2014 and 2018" and concluded "that financial derivatives impacted positively and significantly on risk management in the Nigerian banking sector" (Efanga et al., 2019, p. 323). Topaloğlu & Korkmaz (2019) identified in their study "that there is a significant and negative relationship between the use of derivatives for speculative purposes and systematic risk", but "there was no relationship identified between the use of derivatives for hedging purposes and systematic risk" in banks trading on Borsa Istanbul in Turkey (Topaloğlu & Korkmaz, 2019, p. 152).

However, there are also numerous studies that have investigated the use and effects of derivatives in the non-financial sector. Barton (2001) proved in a sample of 500 non-financial unregulated companies in the United States that managers use derivatives for smooth earnings (Barton, 2001, p. 24). Klersey et al. (2005) examined the effects of the derivative usage on security returns of companies from different industries and found out that "in general investors perceive a difference in the information content of earnings when a firm uses derivatives, and that difference translates into a positive, significant impact on security prices" (Klersey et al., 2005, p. 123). Nguyen & Faff (2010) tested whether the use of a particular type of derivative financial instrument affects the value of a company in a sample of listed Australian companies and concluded that the use of swaps contributed to the discount while the use of options was not harmful to company's value (Nguyen & Faff, 2010, p. 683). Beneda (2013) identified "a strong association between the low reported earnings volatility and the firm use of derivative instruments for hedging in companies in the USA" and confirmed that derivatives used as hedging instruments contributed to a decrease in earnings volatility (Beneda, 2013, p. 165). The study conducted among Pakistani and Malaysian listed companies found out that "the usage of derivative instruments significantly minimizes firm's risk, with respect to operating cash flow variability in both Pakistan and Malaysia". The results also showed that the use of derivatives had a negligible effect on the value of the company in Malaysia, but significantly increased the value of the company in Pakistan (Alam & Afza, 2017, p. 221). The study conducted among Nigerian non-financial companies also suggested "that derivative instruments are positively associated with firm risk" (Firmansyah, 2020, p. 81). The study conducted among non-financial companies listed at the Nairobi Securities Exchange in Kenya revealed that "the use of derivatives in efficiency in trading influences the financial performance of companies" (Waswa & Wepukhulu, 2018, p. 15). Vu et al. identified that risk management control is the strongest factor influencing the intention to use derivatives in listed companies in Hanoi, Vietnam (Vu et al., 2020, p. 805).

The results of the above studies show that derivative financial instruments can affect the financial position and performance of business entities from different industries. Therefore, these findings were the basis for the research objectives and hypotheses of this paper.

3. Methodology

The initial objective of this paper is to investigate whether the effects of measuring derivatives affect the financial position and profitability of Croatian banks. In addition, this paper aims to provide answers to these questions:

1. How many banks in Croatia have recognized in their financial statements the effects of measuring derivatives?
2. Which derivative financial instruments are most often used in Croatian banks?
3. For what purposes are derivative financial instruments used in Croatian banks?
4. Do the effects of measuring derivatives affect the financial position and profitability of Croatian banks?

Based on the main goal of the paper, three hypotheses are set. The first hypothesis (H1) claims that the effects of measuring derivative financial instruments affect the financial position of Croatian banks. The second hypothesis (H2) claim that there is a strong or medium-strong correlation between

the effects of measuring derivative financial instruments and the financial position of Croatian banks. The third claims that there is a strong or medium-strong correlation between the effects of measuring derivative financial instruments and the profitability of Croatian banks. The research covers the period from 2017 to 2020. The research population consists of all banks that operated in Croatia during the research period. According to the Croatian National Bank (CNB), there were 25 banks operating in the Croatian banking sector in 2017, 21 in 2018, and 19 in 2019 and 2020 (Croatian National Bank, 2019, p. 7; Croatian National Bank, 2022). The data required for the implementation of the survey were collected from publicly published annual reports of banks available on bank websites. For research purposes, the effects of measuring derivatives relate to changes in the fair value of derivatives that are recognized in the statement of financial position as derivative financial assets and derivative financial liabilities, and in the income statement as unrealized gains and losses. The financial position is represented by total assets, while profitability is measured by the rate of return on assets (ROA). For each bank that operated in the Croatian banking sector during the research period, all these variables (necessary for conducting research) were taken from the publicly available financial statements of banks. Descriptive statistical methods and correlation analyses based on the Pearson correlation coefficient were applied to achieve the research objectives and test the research hypotheses. The first hypothesis is tested by calculating the share of derivative financial assets and liabilities in total assets of Croatian banks that recognized these derivatives in their financial statements. The second hypothesis is tested based on the results of correlation analysis between derivative financial assets/liabilities and total assets. The third hypothesis was tested based on the results of correlation analysis between derivative financial assets/liabilities and ROA.

4. Results and discussion

The results of the analysis of annual reports of Croatian banks show that in 2017, 7 banks recognized the effects of measuring derivative financial instruments in their financial statements, while 8 banks recognized these effects in 2018, 2019 and 2020. The number and percentage of banks in the Croatian banking sector that recognized the effects of measuring derivatives and their share in total assets and profits or losses of the Croatian banking sector are shown in Table 1.

Table 1 Number and percentage of banks in Croatia that recognized the effects of measuring derivatives and their share in total assets and profit or loss of the Croatian banking sector from 2017 to 2020

Year	Number of banks presenting derivatives in financial statements	Percentage of banks presenting derivatives in financial statements	Share of assets of banks presenting derivatives in the financial statements in total assets of the banking sector	Share of profit or loss of banks presenting derivatives in the financial statements in total profit or loss of the banking sector
2017	7	28.00%	80.85%	103.76%
2018	8	38.10%	93.41%	98.99%
2019	8	42.11%	94.06%	96.73%
2020	8	42.11%	94.46%	95.54%

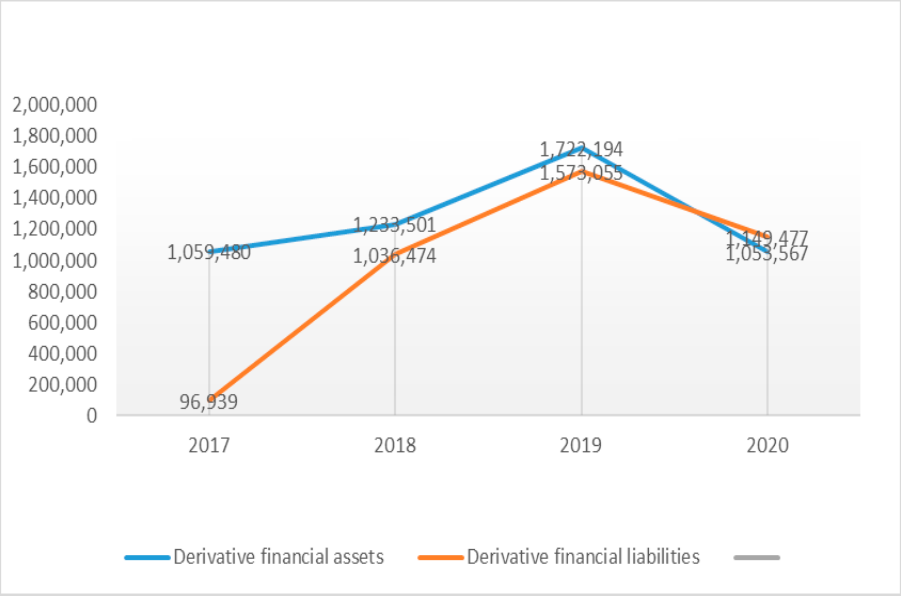
Source: Authors' calculation

Table 1 shows that 7 banks that recognized the effects of measuring derivatives in their financial statements in 2017 represented 28% of the total number of banks in Croatia in 2017, and their share in total assets of the Croatian banking sector was 80.85%, while their profit or loss represented 103.76% of total profit or loss of the Croatian banking sector. In 2018, 2019 and 2020, 8 banks in Croatia recognized in their financial statements the effects of measuring derivative financial instruments. These 8 banks represented 38.10% of the total number of banks in Croatia in 2018 and their share in total assets of the Croatian banking sector was 93.41%, while their profit or loss represented 98.99% of total profit or loss of the Croatian banking sector in 2018. The same 8 banks represented 42.11% of the total number of banks in Croatia in 2019 and 2020. Their share in total assets of the Croatian banking sector in 2019 and in 2020 was

94.06% and 94.46%, respectively, while their profit or loss accounted for 96.73% of total profit or loss of the Croatian banking sector in 2019 and 95.54% in 2020. The results presented above show that the effects of measuring derivatives are recognized in less than 50% of Croatian banks, but banks that have recognized these effects hold more than 80% of total assets of the Croatian banking sector and their profit or loss represents more than 95% of total profit or loss of the Croatian banking sector. The analysis of annual reports of banks in Croatia showed that the effects of measuring derivatives were recognized mainly in the financial statements of large, internationally related banks in Croatia, while small domestic banks in Croatia did not recognize these effects in their financial statements.

The effects of measuring derivative financial instruments relate to changes in the fair value of derivatives between the two reporting dates that are recognized in the statement of financial position as derivative financial assets and derivative financial liabilities. The amount of derivative financial assets and liabilities in the Croatian banking sector for the research period is shown in Figure 1.

Figure 1 Derivative financial assets and liabilities in Croatian banks in the period from 2017 to 2020 (in 000 HRK)



Source: Author's calculation

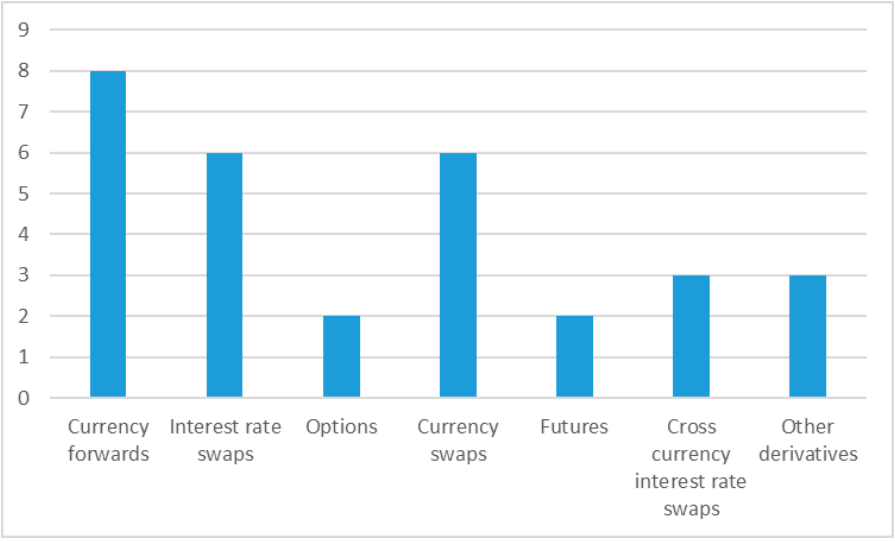
Figure 1 shows that in 2017, 2018 and 2019 the amount of derivative financial assets in Croatian banks was higher than the amount of derivative financial liabilities, while in 2020 the amount of derivative financial liabilities was higher than the amount of derivative financial assets. Based on this, it can be concluded that in 2017, 2018 and 2020 changes in the fair value of derivative financial instruments contributed to an increase in total profit of the Croatian banking sector, while changes in the fair value in 2020 contributed to a decrease in total profit.

According to information disclosed in the annual reports of banks in Croatia, no bank that recognized the effects of measuring derivative financial instruments in its financial statements used derivatives for speculative purposes but for hedging purposes. Derivative financial instruments are mainly used to manage interest rate and currency risk. Despite the fact that derivative financial instruments in Croatian banks are used for hedging purposes, most derivative financial instruments are recognized as stand-alone derivatives and not as hedging instruments because the hedge accounting criteria have not been met. Only 2 banks in 2017 and 3 banks in 2018, 2019 and 2020 applied hedge accounting and recog-

nized the hedge accounting effects in the financial statements.

The effects of measuring derivative financial instruments recognized in the financial statements of Croatian banks relate to the following types of derivatives: currency forwards, currency and interest rate swaps, cross currency interest rate swaps, options, futures and other derivatives. Figure 2 shows the types of derivatives used in Croatian banks and the number of banks using each derivative financial instrument.

Figure 2 Types of derivative financial instruments applied in Croatian banks and the number of banks applying individual derivative financial instruments



Source: Authors' calculation

Figure 2 shows that currency forwards are applied in all 8 banks, currency and interest rate swaps in 6 banks, cross-currency interest rate swaps in 3 banks, and options and futures in 2 banks, while 3 banks also apply other derivative financial instruments. Currency forwards and currency swaps are used to manage currency risk exposure, interest rate swaps are designed to manage interest rate risk exposure, while cross-currency interest rate swaps are used to manage both currency and interest rate risk exposure. Options, futures and other derivatives are designed to manage currency risk or interest rate risk.

In order to investigate the impact of measuring derivatives on the financial position and profitability of banks in Croatia and to test research hypotheses, the effects of measuring derivatives are expressed as a percentage of total assets of banks in Croatia that recognized these effects in their financial statements. Table 2 shows the share of the effects of measuring derivatives recognized as derivative financial assets and liabilities in the statement of financial position of banks in total assets of banks in Croatia that recognized these effects.

Table 2 Derivative financial assets and liabilities expressed as a percentage of total assets of banks in Croatia that recognized these assets and liabilities in the period from 2017 to 2020

Item / Years	2017	2018	2019	2020
Derivative financial assets as a percentage of total assets	0.32%	0.32%	0.43%	0.24%
Derivative financial liabilities as a percentage of total assets	0.03%	0.27%	0.39%	0.27%

Source: Authors' calculation

Table 2 shows that in all observed years the amount of derivative financial assets and liabilities is less than 0.50% of total assets of those banks in Croatia that have recognized in the financial statements the effects of measuring derivative financial instruments. The largest share of derivative financial assets and liabilities in total assets was recorded in 2019, when derivative financial assets and derivative financial liabilities accounted for 0.43% and 0.39% of total assets, respectively, of those banks in Croatia that recognized derivative financial assets and liabilities. These results indicate that the effects of measuring derivatives do not form a significant part of total assets of those banks that have recognized these effects in their financial statements. As these effects may vary among banks, Table 3 shows measures of central tendencies and variations for the share of derivative financial assets and liabilities in total assets of those banks that have recognized derivative financial assets and liabilities in their financial statements.

Table 3 Measures of central tendencies and variations for the share of derivative financial assets and liabilities in total assets of those Croatian banks that have recognized derivative financial instruments in the period from 2017 to 2020

Measures of central tendencies and variations	2017		2018		2019		2020	
	Derivative financial assets	Derivative financial liabilities	Derivative financial assets	Derivative financial liabilities	Derivative financial assets	Derivative financial liabilities	Derivative financial assets	Derivative financial liabilities
Mean	0.15%	0.04%	0.17%	0.13%	0.21%	0.20%	0.17%	0.20%
Standard deviation	0.0029856	0.00054805	0.0031626	0.00272813	0.0043257	0.0039413	0.0019691	0.002048
Min	0.000%	0.000%	0.001%	0.002%	0.004%	0.002%	0.000%	0.000%
Max	0.94%	0.18%	0.99%	0.85%	1.35%	1.23%	0.56%	0.57%
Median	0.03%	0.01%	0.04%	0.02%	0.04%	0.04%	0.10%	0.11%

Source: Authors' calculation

The average share of derivative financial assets in total assets of the bank ranged from 0.15% in 2017, 0.17% in 2018, 0.21% in 2019, to 0.17% in 2020. The average share of derivative financial liabilities ranged from 0.04% in 2017, 0.13% in 2018, to 0.20% in 2019 and 2020. In all observed years, the standard deviation for both derivative financial assets and liabilities is high, which indicates a large dispersion of the share of derivative financial assets and liabilities in total assets among Croatian banks that have recognized derivative financial instruments in their financial statements. Therefore, the median is calculated. The median share of derivative financial assets in total assets of the bank ranged between 0.03% in 2017, 0.04% in 2018 and 2019, and 0.10% in 2020. The minimum share of derivative financial assets in total assets of the bank was 0.000% in 2017, 0.001% in 2018, 0.004% in 2019, and 0.000% in 2020. The maximum share of derivative financial assets in total assets of the bank ranged from 0.94% in 2017, 0.99% in 2018, 1.35% in 2019, to 0.56% in 2020. The median, minimum and maximum values indicate that the largest share of derivative financial assets in total assets of the bank is concentrated in a small number of banks in Croatia.

The median share of derivative financial liabilities in total assets of the bank ranged from 0.01% in 2017, 0.02% in 2018, 0.04% in 2019, to 0.11% in 2020. The minimum share of derivative financial liabilities in total assets of the bank was 0.000% in 2017, 0.002% in 2018 and 2019, and 0.000% in 2020. The maximum share was 0.18% in 2017, 0.85% in 2018, 1.23% in 2019, and 0.57% in 2020. The median, minimum and maximum values also show that the largest share of derivative financial liabilities in the bank's total assets is concentrated in a small number of banks in Croatia.

The results presented above confirm that the effects of measuring derivative financial instruments do not form a significant part of total assets of Croatian banks. Based on these results, it can be concluded that the effects of measuring derivatives do not have a serious impact on the financial position

of banks in Croatia. These results are based on the results of a previous study on the application of derivatives in the Croatian banking sector, which also showed that derivative financial instruments did not have a significant impact on the financial position of the Croatian banking sector (Perčević & Gulin, 2012). Furthermore, previous research results showed that the average percentage of derivative financial assets in total assets of banks in developed EU countries ranged from 8.08% in 2006 and 10.72% in 2007 to 23.75% in 2008, while the average percentage of derivative financial liabilities ranged from 8.81% in 2006 and 11.45% in 2007 to 24.07% in 2008 (Türel & Türel, 2014, pp. 172-181). Unlike banks in Croatia, the effects of measuring derivative financial instruments in banks in developed EU countries make up a significant part of total bank assets and can significantly affect their financial position. Since the research results do not support the hypothesis that the effects of derivative measurements affect the financial position of banks in Croatia, the first hypothesis (H1) is rejected.

This paper also aims to determine a correlation between the effects of measuring derivatives and the financial position (i.e. total assets) of banks and a correlation between the effects of measuring derivatives and the profitability of banks measured by return on assets (ROA). The results of correlation analysis based on the Pearson correlation coefficient are shown in Table 4.

Table 4 Correlation analysis between derivative financial assets and liabilities and total assets and ROA of banks in Croatia in the period from 2017 to 2020

Items	Pearson correlation coefficient	
	Total assets	ROA
Derivative financial assets	0.692959883	0.169777980
Derivative financial liabilities	-0.671962809	-0.199172610

Source: Authors' calculation

The values of the Pearson correlation coefficient show that there is a medium-strong positive correlation between the fair value of derivative financial assets and total assets and a medium-strong negative correlation between derivatives and total assets of banks in Croatia that recognized the effects of measuring derivatives in their financial statements. These results suggest that an increase in the fair value of derivative financial assets is likely to seriously contribute to an increase in total bank assets, while an increase in the fair value of derivative financial liabilities would seriously contribute to a decrease in total bank assets. Since the results of correlation analysis support the hypothesis that there is a medium-strong correlation between derivative financial instruments and the financial position of Croatian banks, the second hypothesis (H2) is accepted. These results correspond to the results of previous similar studies conducted in the banking sector of Turkey (Türel & Türel, 2014, p. 184), and in banks in Romania (Huian & Apostol, 2014, p. 74).

The values of the Pearson correlation coefficient show that there is a weak positive correlation between the fair value of derivatives and ROA and a weak negative correlation between the fair value of derivatives and ROA banks in Croatia that recognized the effects of measuring derivatives in their financial statements. These results show that changes in the fair value of derivative financial instruments are unlikely to seriously affect the ROA of banks in Croatia. Based on these results, the third research hypothesis (H3) is rejected. Previous similar studies have shown that derivatives negatively affect bank performance in emerging and recently developed countries (Keffala et al., 2013, p. 2), but positively affect bank performance in developed countries (Brewer et al., 1996; Keffala et al., 2013, p. 2).

5. Conclusion

Derivative financial instruments are widely used in banks and other financial institutions, primarily in those operating in developed financial markets. The initial purpose of this paper was to investigate whether the effects of measuring derivatives seriously affect the financial position and profitability

of banks in Croatia. The research covers the entire research population, i.e. all banks that operated in Croatia in the research period from 2017 to 2020. The research results showed that derivative financial instruments are mostly used in large banks in Croatia, which constitute more than 80% of total assets and generate more than 95% of total profit or loss of the Croatian banking sector. Small banks in Croatia do not use derivative financial instruments. Derivative financial instruments in banks in Croatia are primarily used for hedging purposes, but hedge accounting is not widely used due to the fact that most banks in Croatia that use derivative financial instruments do not meet the criteria for hedge accounting. Therefore, derivative financial instruments are generally treated as stand-alone instruments and are classified into the category of financial assets at fair value through profit or loss. Banks in Croatia mainly use currency forwards and currency swaps to manage currency risk exposure, interest rate swaps to manage interest rate risk exposure, and cross-currency interest rate swaps to manage both currency and interest rate risk exposure.

The research results showed that the effects of measuring derivative financial instruments do not affect the financial position and profitability of those banks in Croatia that have recognized these effects in their financial statements. However, the results of correlation analysis indicate a medium-strong correlation between the effects of measuring derivative financial instruments and the financial position of Croatian banks. According to the results of correlation analysis, if the use of derivative financial instruments in Croatian banks were intensified, the effects of measuring derivatives would significantly affect the financial position, but not the profitability of banks.

This paper contributes to previous findings in the field by establishing that derivative financial instruments are not widely used in Croatian banks, so the effects of their measurement do not affect the financial position and profitability of banks in Croatia. This is an advantage in the conditions of market turbulence since the value of derivatives is very variable, but it also indicates that Croatian banks do not use derivatives sufficiently for hedging purposes. By using derivatives for hedging purposes, Croatian banks could further optimize their financial performance. Therefore, this paper contributes to accounting practice by recommending the use of derivative financial instruments as hedging instruments within the hedge accounting criteria defined in IFRS 9. Therefore, the effects of risk management would be properly identified in the financial statements and would also optimize financial performance.

It is also important to note that this research has certain limitations. The study covered a period of four consecutive years, which is relatively short for correlation analysis. The survey was conducted only among banks in Croatia. Although all large banks in Croatia use derivative financial instruments, there are a large number of banks in Croatia that do not use derivative financial instruments. In addition, the use of derivative financial instruments in large banks is still not at the level of banks in developed EU countries, so data on the effects of measuring derivatives are lacking. The research did not provide an answer to the question why derivative financial instruments are not widely used in Croatian banks. Therefore, future research on this topic will address this issue. In addition, future research will focus on the application of derivative financial instruments in the non-financial sector and identify the impact of measuring derivatives on the financial position and performance in the non-financial sector.

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CONSUMER ETHNOCENTRISM INFLUENCE IN CHOOSING A HOTEL IN DOMESTIC TOURISM – EVIDENCE FROM ROMANIA AND CROATIA

Abstract

Purpose: The role of consumer ethnocentrism (CE) in choosing a hotel is still not well explored. This research aims to identify if there is a relationship between CE and the preference of Romanian/Croatian respondents for a hotel belonging to a domestic chain vs. international (foreign) chain.

Methodology: Exploratory and descriptive research was performed. The data were collected thorough an online survey, aiming for a quota sample stratified by age and gender. The resulting sample comprises 714 and 832 valid questionnaires in Romania and in Croatia, respectively. Factor analysis, nonparametric correlation analysis, and hypothesis testing were performed.

Results: "Defensive patriotism" and "protectionism" were identified as CE factors. CE is moderately expressed for Croatian and Romanian respondents. Respondents from two countries with higher CE factors prefer a national rather than an international hotel. Customers who grew up in the communist era have higher ethnocentrism scores on defensive patriotism and protectionism and prefer national hotels more than those formed in the post-communist period.

Conclusion: The results of this research relate to the previously revealed regularity that ethnocentric consumers prefer buying national rather than foreign goods and services. The same is now confirmed for respondents' hotel preferences when engaging in domestic tourism, contributing to closing a research gap. However, the results indicate that polycentric consumers might evaluate hotels by other criteria and not necessarily by their association with an international chain. In addition, in the case of re-checking post-COVID-19 results, the results presented here can serve as a pre-COVID-19 baseline.

Keywords: Consumer ethnocentrism, CETSCALE, defensive patriotism, protectionism, consumer preference, hotel chain

1. Introduction

When a company in general, and an international hotel chain in particular, wants to penetrate a new international market, it is very important to know the behavior of the customers in order to understand their motivations, attitudes and values when buying these services (Jiménez-Guerrero et al., 2014; Niininen et al., 2006). How and why consumers choose to stay in a hotel are some questions that marketers need to answer (Han & Kim, 2010).

Nowadays, competition between hotels has intensified to attract new guests and keep customers loyal. Hotel groups have changed their strategy by consolidating with other brands. This enables them to increase their global presence, get a place in new geographical locations and penetrate deeper into existing high revenue generating markets (Hawkley, 2021). International hotel chains have approximately 40% of the market worldwide and aim to increase this figure to 50% by 2030 (Fleșeriu, 2014). In Europe, there is still a significant proportion of privately-run hotels and low brand penetration, indicating a considerable potential for international hotel chains to gain market share (Hawkley, 2021).

Emerging consumer ethnocentric tendencies constitute a significant concern for companies operating in developed countries. Shimp and Sharma (1987) developed the concept primarily as a consumer tendency to prefer 'made in the country' products vs. those 'made in a foreign country.' It has been thirty years since Herche (1992) showed that consumer ethnocentrism (CE) might drive consumer choices. Although much attention has been given to the research on the CE effect on product purchases, services are less frequently examined. Ethnocentrism received little attention in tourism (Kock et al., 2019; Farah & Mehdi, 2021). Moreover, research on CE effects on hotel choice is even more scarce (Farah & Mehdi, 2021).

When choosing a destination country, tourists show a level of homophily, which primarily stems from opportunity (geographical proximity, low cost, and less time consumption) and similarities (socioeconomic factors, common culture, language) (Kostelić & Turk, 2021), where the latter may arise from home country bias and ethnocentrism (Kock et al., 2019).

Through socialization routines, ethnocentrism and CE are learned early in life (Shimp & Sharma, 1987; Siamagka & Balabanis, 2015). Their antecedents comprise socio-psychological, political, economic, and demographic factors (Shankarmahesh, 2006). CE is related not only to the country of origin but also to the country of residence, and its level will depend on different interactions and influences occurring in an ethnic group or a country (Siamagka & Balabanis, 2015). Buy local campaigns are conducted in many countries over the world to defend national identities, protect local jobs, restrain imports, and improve trade balances (Siamagka & Balabanis, 2015). In the tourism and hotel industry, that can be translated into domestic and international hotel chains' intentions to capture the interest of domestic tourists and the loyalty of tourists from the same country of origin as an international chain. While encouraging CE, such actions are not popular only in developed but also in developing countries. While developing countries strive to achieve economic development, they become increasingly attractive to foreign companies.

Weaver et al. (2023) emphasize a geopolitical aspect of tourism, where countries and regions must balance globalization and nationalism, domestic and international tourism, and migration and immigration trends. International mass tourism and immigration tend to wake residents' national and ethnocentric attitudes. These concepts adversely affect companies' export activities, attracting marketers' interest (Farah & Mehdi, 2021).

Global positioning, market entry decisions, and the materialization of country-of-origin effects can be affected by CE (Siamagka & Balabanis, 2015), so underlying CE tendencies may affect the survival of international chains in a foreign country.

The sociological, economic, and managerial implications reveal the importance of learning whether the effects of CE exist in the hotel industry. Currently, it requires a deeper understanding of the role of CE in choosing accommodation in a hotel. The findings on CE could help explain the success rate of international chains, but it can also help companies make managerial decisions.

In order to contribute to the understanding of the role of CE in choosing a hotel, this research focuses on two comparable developing countries (Croatia and Romania), with the aim of finding out about the level of present CE. Furthermore, the goal is to examine the relationship between CE, the importance of a hotel belonging to an international (foreign) chain, and a consumer preference for booking

a room in a hotel belonging to a national (domestic) or an international (foreign) chain. As CE relates to the environment where a person grows up, the goal is to examine if a difference exists between the people who grew up in different regimes (i.e., a socialist regime versus an open economy).

2. Theoretical and conceptual background

The concept of CE was introduced by Shimp and Sharma (1987, p. 280). It was defined as "… the belief held by American consumers about the appropriateness, indeed morality, of purchasing foreign made products. From the perspective of ethnocentric consumers, purchasing imported products is wrong because, in their minds, it hurts the domestic economy, causes loss of jobs, and is plainly unpatriotic…". Sharma et al. (1995) assume that CE influences consumer choice, but they also assume that social-psychological factors (such as collectivism, patriotism, cultural openness, and cosmopolitanism), demographic variables (i.e. age, gender, education, income) and moderating factors (i.e. perceived product necessity, economical threat) also impact consumer choices and preferences. CE was characterized as a "three-folded phenomenon" (Sharma et al., 1995):

- consumers' concern and love for their own country but also the fear of losing control over the country's economic interests and consequently harming themselves and their country,
- lack of intention to buy foreign products for economic and moral reasons,
- the overall level of CE is considered as the sum of individual tendencies.

CE can be internalized through socialization, depending on the transferred cultural values present in a community, region, or country. According to Piaget's theory, consumer behavior begins at birth and has four stages of development (Piaget, 1947): the sensorimotor period of development (between birth and age of 2), the preoperational period (ages 2-7), the concrete operational period (ages 7-11) and the formal operational period (age 11 and older). Although Piaget does not emphasize the environmental factors, they must not be ignored. Until the age of 7, children are less influenced by external factors, because they see the world from their point of view, are egocentric and think that everyone has the same view of the world as they do (Šramová, 2017). After the age of seven, children become more susceptible to external factors. At the time, children observe, learn, and internalize communal values and attitudes. In that stage, children begin to develop their cognitive ability for conceptual complexity and logical thinking, so they can (re)think the mental representations created at an earlier stage. Moreover, the concrete operational period is a developmental stage characterized by children's ability to group items by similar properties (or to create a series of items by specific properties). It means that they become aware of the similarities and differences as a basis for grouping and classification, which is also a requirement for any form of ethnocentrism.

Different levels of ethnocentrism can arise from different socialization experiences (Ryan et al., 2007). In the context of two countries of interest, both of which were under the communist regime until 1989 (1990) and in open economies after that period, it can be assumed that there could exist a difference in internalized values and attitudes between people who reached the concrete operational stage in the first regime and those who reached the same developmental stage in the other regime. More precisely, we assume that there is a difference in CE between the people who reached the age of seven in the communist regime and those who reached that age in the open economy regime. So, we can state the following hypothesis:

H1: People that reached the operational stage in the communist regime are more ethnocentric than those from the open economy.

The area of CE in a purchase choice of goods has been thoroughly investigated. Although it does not allow for a direct comparison, it provides a substantial theoretical background from which we draw assumptions about tourist choices and behavior.

Studies show that the ethnocentric attitude is not seen just as an obligation to buy locally made products, but also as a determinant of product perceptions (Pecotich & Rosenthal, 2001; Smaiziene & Vaitkiene, 2013). When having a high level of consumer ethnocentrism, people do not just give higher ratings to domestic products (Acharya & Elliott, 2003; Carpenter et al., 2013), but they are also willing to pay higher prices for them (Drozdenko & Jensen, 2009). However, Siemieniako et al. (2011) argued that a preference for locally produced goods

does not necessitate rejection of imported goods. Still, Siamagka and Balabanis (2015) show that the more ethnocentric the consumers in the US and the UK are, the greater their preference for domestic brands and reluctance to buy foreign products. A study of the Romanian consumer ethnocentric tendencies and the countries towards which they feel animosity (Russia, Hungary, and South Korea) revealed that the country of origin significantly impacted product evaluation, with a notable difference between domestic and foreign products (Licsandru et al., 2013). Another research determined that the consumer ethnocentric tendency related positively to the intention to purchase local products and negatively to products from former Yugoslavia and the European Union (Renko et al., 2012). However, ethnocentric tendencies also depend on age, education level, income level, religiosity, and life satisfaction (Matić, 2013). Stoenescu & Căpățînă (2015) find that origin can affect the identity and the perception of a brand among Romanian consumers because consumers still tend to associate them with their country of origin. They see a possibility for competitive advantage in the image of the country of a brand projected to the public.

Consumers that are not ethnocentric, also called polycentric consumers, evaluate products based on other criteria such as quality, performance, and price (Bawa, 2004), or possibly even see them more favorably because they are foreign (Shimp & Sharma, 1987; Chang & Cheng, 2011). On the other hand, highly ethnocentric consumers tend to perceive imported products as having lower quality and decreased equity (Shankarmahesh, 2006; Saffu et al., 2010). This attitude can lead to an overestimation of domestic products or an underestimation of foreign ones (Sharma et al., 1995; Cumberland et al., 2010). Highly ethnocentric consumers pay more attention to aspects such as the country-of-origin, while non-ethnocentric consumers pay more attention to other aspects (Cumberland et al., 2010), not feeling at the same time any moral obligation to purchase domestic products (Aryal et al., 2009; Saffu et al., 2010).

Ethnocentrism involves a feeling of superiority over other groups, but it also stimulates a strong social identity, increases self-esteem, group loyalty, and group survival, and reduces inter-group problems (Platenkamp, 2014). According to the same author, it occurred as a crucial concept in tourism studies when examining the Western feeling of superiority in the postcolonial context. However, the author argues that diverse tourism networks, along with the exchange of cultural elements globally, made way for cosmopolitanism as an opposite construct of ethnocentrism. That approach might explain the lack of continuing research on ethnocentrism in tourism.

Only a few studies analyzing CE tendencies in hotels and tourism-related choices have been identified in the literature review. Elida et al. (2016) found CE relevant to Indonesian people's choices of foreign hotel brands. Kvasina et al. (2018) found unusual results for respondents in southern Croatia: people traveling abroad and having a more expressed interest in traveling abroad have a higher level of CE than those who travel less and have a lower desire to travel abroad. Another unusual finding was that younger people have more pronounced tendencies of CE than older people. Li and Xie (2021) found that in the hospitality industry, the effect of country-related affect on trust (which affects purchase intention) is weaker for consumers with a high level of consumer ethnocentrism. Cassia and Magno (2022) examine the effects of ethnocentrism on international hospitality brands (the case of Starbucks) and find a positive relationship between CE and brand in a domestic country. However, they also find that in the foreign market, ethnocentrism only indirectly affects the brand image.

Oh et al. (2020) investigate determinants of hotel selection in the global travel context and reveal that ethnocentrism has a significant direct relationship with a brand attitude but only an indirect relationship with purchase likelihood. They conclude that ethnocentrism seems to be completely absorbed in a brand attitude. The same authors notice the lack of research on the topic, making a generalized approach used in this industry a challenge.

Kock et al. (2019) also notice the lack of research on the topic and claim that ethnocentrism received little attention in the tourism context, but it has important implications for tourism behavior. They found that tourism ethnocentrism affects tourists' willingness to participate in domestic tourism, their recommendation of domestic tourism, and local support for the growth of domestic tourism. Kock et al. (2020) raise awareness of the possible strengthening of ethnocentrism trends as they reveal a statistically significant relationship between perceived COVID-19 infectability and tourism ethnocentrism. Along with Weaver et al.'s (2023)

warning about the need for a balance between globalization and nationalism, and domestic and international tourism, where the lack of balance might cause the awakening of national and ethnocentric attitudes of residents, these findings additionally motivate further investigation of CE in tourism.

Assuming that similar regularities can occur for choosing a hotel, the following hypotheses are stated:

H2: There is a statistically significant association between CE scores and preference for a hotel from a national chain.

H3: There is a statistically significant negative association between the CE score and the importance of a hotel from an international chain.

3. Methodology

3.1 Measuring consumer ethnocentrism

In order to analyze CE, Shimp and Sharma developed a 17-item scale named the CETSCALE (Consumer Ethnocentrism Tendencies Scale). The original scale was created to test the tendencies related to tangible products (Shimp & Sharma, 1987). De Ruyter et al. (1998) wanted to create an extension of the model that can be used in the service sector. They defined CE tendencies in terms of service products as "*the belief held by consumers about the appropriateness of making use of services provided by foreign companies*" (de Ruyter et al., 1998, p. 187).

In the last 20 years, researchers have used the CETSCALE, adapting the number of items based on what they wanted to analyze. The scale was used not only in developed countries (e.g. the U.S., Germany, France, Japan, etc.) but also in emerging ones (e.g. China, Russia, Hungary, Poland, Estonia, etc.) (Jiménez-Guerrero et al., 2014). Studies have shown that in developed countries consumers prefer domestic over foreign products, while in the emerging countries the reverse is true (Hauge, 2012).

Even if different researchers consider the scale reliable (Nadiri & Tümer, 2010), it has some limitations. The scale measures a degree to which the consumers are ethnocentric and not if they are ethnocentric or not (Bawa, 2004). Furthermore, it does not allow the ranking of consumers based on their ethnocentrism level (Ganideh & Taee, 2012).

Another consideration is a dispute between the researchers regarding the CETSCALE dimensionality. A unidimensional scale implies that a single latent construct is located at the base of a set of items (Hattie, 1985). While it is true that in practice no measurement instrument can be perfectly unidimensional (Wright & Linacre, 1989), a measurement instrument must be capable of representing a single dominant factor with its scores. This can be done by obtaining a single latent attribute explaining as much as possible of the variance in individual responses to the items comprising that instrument (Embretson & Reise, 2000). Different research studies show that the scales developed in different countries have two, three or even four dimensions (Jiménez-Guerrero et al., 2014). Most frequently, there are two dimensions named "hard ethnocentrism" and "soft ethnocentrism" or "defensive patriotism" and "protectionism" (Chryssochoidis et al., 2007; Ramayah et al., 2011; Hsu & Nien, 2008). The first component indicates the discouragement of buying foreign products. The second component involves the encouragement to buy domestic products.

Although the scale was used a lot, especially for identifying the level of ethnocentrism in relationship with products, a limited number of studies analyze consumer ethnocentric tendencies in the hospitality industry, and even less in the hotel industry. That limits the comparison of the obtained results.

The CET scale has been utilized in research on consumer behavior in Romania and Croatia. These two countries were chosen because both are developing European countries with similar political and socioeconomic influences throughout history. Both were under the communist regime until 1989 (1990) and have had an open economy afterwards. They are part of the EU and border with the Schengen area, which makes them an intermediate migration station. While the tourism sector is an economic driver in Croatia with a share of 16.3% of GDP in 2019, the Romanian tourism sector made 5.3% of GDP in the same year (Statista, 2022a; 2022b). In 2017, there were 721 hotels in Croatia (Ministry of Tourism, Republic of Croatia, 2018). The Croatian sector is dominated by domestic rather than international chains. In 2017, only 59 (8% of the total number of hotels) out of 186 hotels belonging to a chain belonged to an international chain. In 2018, the total number of hotels increased to 754 (Ministry of Tourism, Republic of Croatia, 2018), but those belonging to international chains decreased to 45 accommodation units (Horwath HTL, 2018; Horwath HTL, 2019). In Romania, in 2017, 51 out

of a total of 1,688 hotels were part of international chains, representing just 3.03% of the national market (Cushman & Wakefield Echinox, 2018).

While other studies use this scale in both countries, their focus is not on tourism or the hotel industry but on products and retail, often with the inclusion of other variables far beyond the scope of this research. Even though different scales have been developed to measure ethnocentrism, the CETSCALE is the most frequently used one. To investigate a relatively unexplored topic, we decided to use a well-established scale.

3.2 The questionnaire used in the study

This research aims to find out the current level of CE in the two examined countries. Furthermore, the goal is to examine the relationship between CE, the importance of a hotel belonging to an international (foreign) chain, and a consumer preference for booking a room in a hotel belonging to a national or international (foreign) chain. As CE relates to the environment where a person grows up, the goal is to examine if there is a difference between the people who grew up in different regimes (i.e., a socialist regime versus an open economy).

The first part of the questionnaire contains general questions regarding a consumer preference for booking a room at a hotel belonging to a domestic (ownership of the same country of origin) or international (foreign ownership) chain. This is in line with preferences for 'made in the country' products vs. those 'made in a foreign country' (Shimp & Sharma, 1987). An international hotel chain is understood as a hotel chain with foreign ownership, and the domestic hotel chain has domestic ownership. An additional clarification was that the statement refers exclusively to accommodation within the country (i.e. Croatia for Croatian respondents and Romania for Romanian respondents). The item is measured on a scale from 1 to 7, where 1 denotes a strict preference for a hotel belonging to an international chain, and 7 denotes a strict preference for a hotel belonging to a domestic chain. The next question was about the importance of a hotel belonging to an international chain. This question should make it possible to conclude whether polycentric consumers find international chains more favorable just because they are foreign (Shimp & Sharma, 1987; Chang & Cheng, 2011). The respondents were informed that this statement also refers exclusively to accommodation within the country. The answers were recorded on a seven-point Likert-type scale (from 1 denoting 'not important at all' to seven denoting 'completely important').

The second part contains the original CETSCALE developed by Shimp and Sharma (1987) with all 17 items translated and adapted to the Romanian and Croatian population. The last part includes demographic information such as gender, age, monthly income, education and marital status. The draft questionnaire was pretested and based on the comments and suggestions provided by the respondents, it was adapted in terms of language and content.

3.3 Data collection

The questionnaire was handed out to domicile residents in both countries in June 2018 and March 2019. The sampling method was a quota sample stratified by age group and gender. The age was stratified into the following groups: born in 1964 or before, born between 1965 and 1980, born between 1981 and 1994, and born after 1995. The targeted respondents were Croatian and Romanian adults (18 years or older). The minimum required sample size should comprise at least 385 responses from Croatia and as many from Romania, with a 95% confidence level and a 5% margin of error (Calculator.net, 2022).

3.4 Data analysis

Descriptive statistics were calculated to get insight into the sample, distribution of preference between national and international hotels, and distribution of the importance of a hotel belonging to an international chain. The CETSCALE items were analyzed to confirm scale reliability and validity. The reliability was checked using Cronbach's alpha, an appropriate internal reliability measure for Likert-type scales (Taherdoost, 2016). KMO measure and Bartlett's test of sphericity were used to check sample adequacy. The correlation matrix determinant was used to examine possible multicollinearity issues. Principal component analysis was conducted to examine the uni/multidimensionality of the scale. Based on the identified components, means and standard deviations per item and component were calculated for both the Croatian and the Romanian respondents, enabling insight into the CE level in both samples.

In order to examine whether people with a higher level of CE prefer a hotel belonging to a national

chain over a hotel belonging to an international chain, a nonparametric correlation coefficient was calculated and tested for significance.

A nonparametric correlation coefficient was also calculated to check if polycentric consumers find a hotel's association with an international chain more important (the assumed negative correlation between CE and the importance of a hotel belonging to an international chain).

Finally, an independent t-test was applied to examine the difference in CE between the people who reached the age of seven in the communist regime and those who reached that age in an open economy.

4. Results and discussions

A sample of 714 valid responses from Romania and 832 from Croatia was obtained. The majority of Romanian respondents belong to Cluj county (in the west of the country), and the majority of Croatian respondents belong to the region of Istria (in the west of the country). Both regions are developed from a touristic standpoint. While the sample is somewhat large, it is a convenience sample given the method of collection. A non-probabilistic sample of respondents may cause selection bias, which is a limitation in research. The demographic structure of the respondents is presented in Table 1.

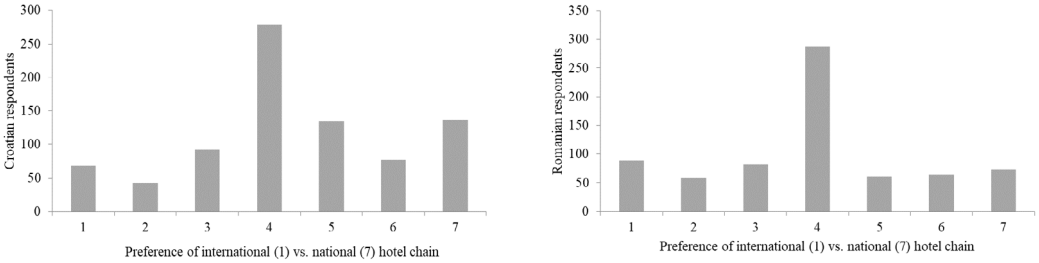
Table 1 Demographic variables

Variable	Romania		Croatia	
	Frequency	Percentage	Frequency	Percentage
Age				
18-23 years old	204	28.57%	229	27.5%
24-37 years old	217	30.39%	216	26%
38-53 years old	164	22.97%	193	23.2%
54-77 years old	129	18.07%	181	21.8%
over 77 years old	-	-	13	1.6%
Gender				
Female	398	55.74%	436	52.4%
Male	316	44.26%	396	47.6%
Education				
Basic education	26	3.64%	50	6%
High school	198	27.73%	473	56.9%
Post-secondary	45	6.30%	148	17.8%
University studies	299	41.88%	124	14.8%
Postgraduate university studies	146	20.45%	38	4.6%
Income*				
<1,200 lei/ <1,800 kn	158	22.13%	188	22.6%
1,200-2,200 lei/ 1,800-3,400kn	189	26.47%	159	19.1%
2,200-3,200 lei/ 3,400-5,000 kn	155	21.71%	211	25.4%
3,200-4,200 lei/ 5,000-6,600 kn	96	13.45%	160	19.2%
>4,200 lei/ >6,600 kn	116	16.24%	114	13.7%
Marital status				
Single/not married	264	36.97%	295	35.5%
In a relationship/married without children	178	24.93%	169	20.3%
In a relationship/married with children	272	38.10%	368	44.2%

*1 euro = 4.74 lei, 1 euro = 7.39 kuna
Source: Authors

When asked what kind of hotel they prefer (international or national), the distribution differs between the countries. In Croatia, 41.9% and 24.5% of respondents prefer national and international hotels, respectively, while 33.5% prefer to be neutral. In Romania, the distribution is quite symmetric, i.e. 27.7% prefer national hotels, while 32.2% prefer international ones. Most respondents (40%) do not prefer either national or international hotels (Figure 1).

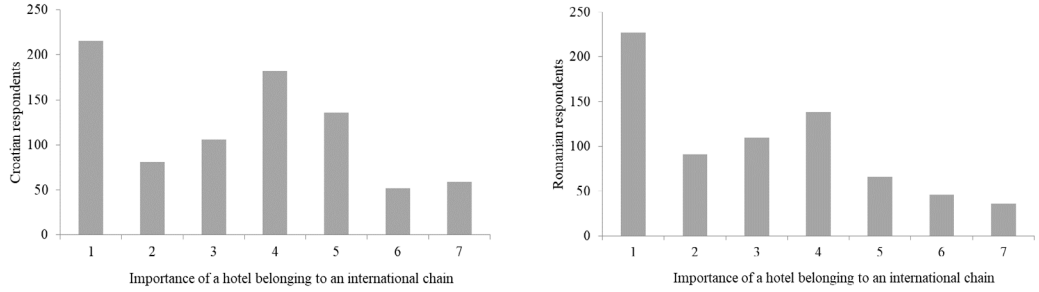
Figure 1 Distribution of preferences for national (7) and international (1) hotels (Croatia on the left and Romania on the right)



Source: Authors

The distribution of the importance of a hotel belonging to an international chain is asymmetric for both countries. For 35.7% of Croatian and 44.54% of Romanian respondents, it is not important whether a hotel belongs to an international chain. For only 13.34% of Croatian and 11.48% of Romanian respondents, it is entirely or very important that a hotel belongs to an international chain. That a hotel belongs to an international chain (responses 3, 4, and 5) is neither important, nor unimportant, slightly important, or slightly unimportant for 50.96% of Croatian and 43.98% of Romanian respondents.

Figure 2 Distribution of the importance of a hotel belonging to an international chain (Croatia on the left and Romania on the right)



Source: Authors

4.1 CETSCALE analysis

Factor analysis was performed on 17 variables to find out to which extent the Romanian and the Croatian population are ethnocentric. Each variable was coded as in Table 2.

Table 2 Coding of questionnaire items into variables

Variable	Item in the questionnaire
V01	1 Croatian/Romanian people should always buy Croatian/Romanian products instead of imported products
V02	2 Only those products that are unavailable in Croatia should be imported
V03	3 Buy Croatian-/Romanian-made products. Keep Croats/Romanians working
V04	4 Croatian/Romanian products, first, last and foremost
V05	5 The purchase of foreign products is non-Croatian/non-Romanian
V06	6 It is not right to purchase foreign products, because that leaves Croats/Romanians out of work
V07	7 A real Croat/Romanian should always buy Croatian-/Romanian-made products
V08	8 We should purchase products manufactured in Croatia instead of letting other countries get rich off us
V09	9 It is always best to purchase Croatian/Romanian products
V10	10 There should be very little trade or purchase of products from other countries, unless absolutely necessary
V11	11 Croats/Romanians should not buy foreign products, because this hurts Croats/Romanians and causes unemployment
V12	12 Curbs should be put on all imports
V13	13 It may cost me in the long run, but I prefer to support Croatian/Romanian products
V14	14 Foreigners should not be allowed to place their products on our market
V15	15 Foreign products should be taxed heavily to reduce their entry into Croatia/Romania
V16	16 We should buy from foreign countries only those products that we cannot get in our own country
V17	17 Croatian/Romanian consumers who purchase products made in other countries are responsible for their fellow Croatian/Romanians losing their jobs

Source: Authors

Cronbach's alpha is 0.952 for the Croatian sample and 0.956 for the Romanian sample, indicating a high internal reliability of the scales. The extraction method that was used was principal component analysis with an Oblimin rotation. An oblique rotation method was chosen as the two factors are considered to be interrelated. The analysis was done by using the correlation matrix and it yielded two components. Because of some cross-loadings items, items 8 and 9 in the Romanian sample and item 13 in the Croatian sample were excluded from the analysis, and the analyses were rerun.

For the Romanian sample, KMO measure of sampling adequacy (0.953) and Bartlett's test of sphericity ($\chi^2(105)=8055.439$, $p<0.001$) show that the sample is adequate for this type of analysis. Furthermore, the correlation matrix determinant is t=0.0000113, indicating that there is no problem with multicollinearity for this sample. All communalities (Table 3) have a value greater than 0.5, indicating that all retained variables are adequate for analysis.

The analysis yielded two components that explain 67.747% of the variance. Only these two components had eigenvalues greater than 1, and the third one was 0.751.

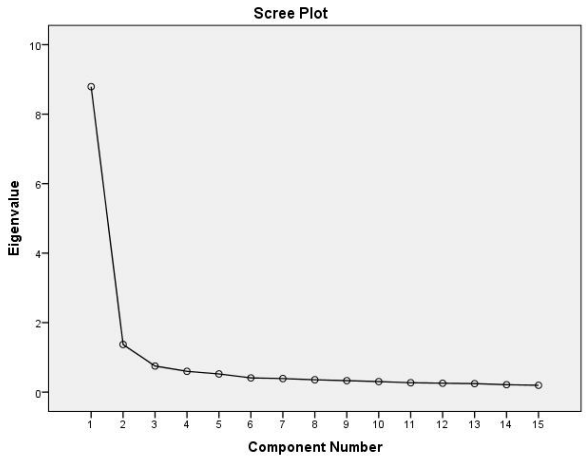
Table 3 Pattern matrix and communalities for PCA on the Romanian sample

Variables	Component/factor		Communalities
	1	2	
V14	**0.926**	-0.136	0.731
V17	**0.914**	-0.095	0.745
V12	**0.885**	-0.158	0.648
V11	**0.754**	0.173	0.749
V06	**0.739**	0.094	0.635
V07	**0.712**	0.189	0.697
V15	**0.686**	0.100	0.560
V05	**0.646**	0.143	0.544
V10	**0.598**	0.330	0.694
V16	**0.522**	0.346	0.598
V03	-0.191	**0.964**	0.754
V01	0.149	**0.759**	0.728
V04	0.242	**0.717**	0.771
V02	0.176	**0.703**	0.667
V13	0.345	**0.551**	0.642

Extraction method: Principal component analysis.
Rotation method: Oblimin with Kaiser normalization.
Coefficients that are greater than 0.3 and have been retained for that factor are in bold.
Source: Authors

The scree plot (Figure 3) also indicates the presence of two factors. All factor loadings are greater than 0.5 for their corresponding factor.

Figure 3 Scree plot for PCA of the Romanian sample



Source: Authors

For the Croatian sample, KMO measure of sampling adequacy (0.961) and Bartlett's test of sphericity ($\chi^2(120)=9236.202$, $p<0.001$) show that the sample is adequate for this type of analysis. Furthermore, the correlation matrix determinant is t=0.00001371, indicating that there is no problem with multicollinearity for this sample. All communalities (Table 4) have a value greater than 0.5, indicating that all retained variables are adequate for analysis.

The analysis yielded two components that explain 65.574% of the variance. Only these two components had eigenvalues greater than 1, and the third one was 0.800.

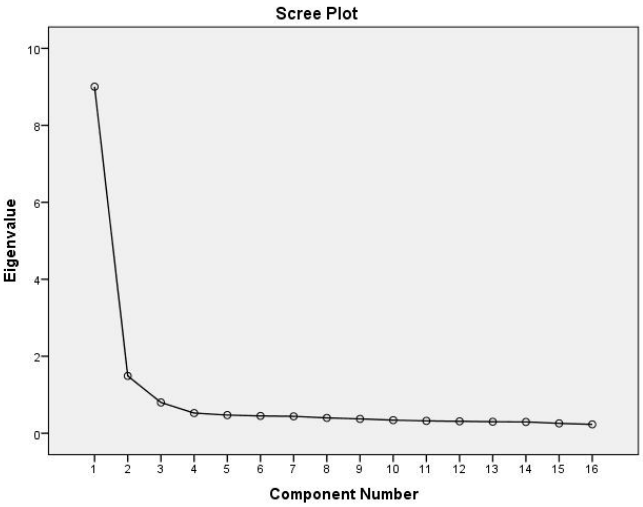
Table 4 Pattern matrix and communalities for PCA on the Croatian sample

Variables	Component/factor		Communalities
	1	2	
V17	**0.914**	-0.113	0.725
V14	**0.888**	-0.107	0.687
V11	**0.882**	-0.035	0.743
V06	**0.789**	0.045	0.668
V05	**0.777**	0.009	0.612
V07	**0.685**	0.141	0.604
V15	**0.580**	0.236	0.556
V12	**0.549**	0.276	0.557
V10	**0.527**	0.379	0.659
V03	-0.190	**0.932**	0.695
V02	-0.025	**0.839**	0.680
V01	0.040	**0.814**	0.702
V04	0.215	**0.691**	0.700
V08	0.314	**0.585**	0.659
V16	0.288	**0.574**	0.608
V09	0.368	**0.524**	0.638

Extraction method: Principal component analysis.
Rotation method: Oblimin with Kaiser normalization.
Coefficients that are greater than 0.3 and have been retained for that factor are in bold.
Source: Authors

The scree plot (Figure 4) also indicates the presence of two factors. All factor loadings are greater than 0.5 for their corresponding factor.

Figure 4 Scree plot for PCA of the Croatian sample



Source: Authors

For both countries, the CETSCALE identified two components of CE. The first component, named "hard ethnocentrism" (Chryssochoidis et al., 2007; Ramayah et al., 2011) or "defensive patriotism" (Hsu & Nien, 2008) in other articles, discourages the purchase of foreign products. The second component, called "soft ethnocentrism" (Chryssochoidis et al., 2007; Ramayah et al., 2011) or "protectionism" (Hsu & Nien, 2008), encourages the purchase of domestic products. The authors chose to name the two components "defensive patriotism" and "protectionism".

Table 5 Means and standard deviations per item and component for Croatian and Romanian respondents

Component	Items	Croatian respondents	Romanian respondents
Defensive patriotism	V05	3.749 ± 1.83	3.331 ± 1.87
	V07	3.87 ± 1.99	3.574 ± 1.99
	V15	4.145 ± 1.82	3.685 ± 1.92
	V12	4.24 ± 1.84	3.287 ± 1.93
	V10	4.256 ± 1.76	3.867 ± 1.92
	All items (a component)	4.052 ± 1.86	3.567 ± 1.97
Protectionism	V03	5.282 ± 1.63	5.579 ± 1.54
	V02	4.811 ± 1.87	4.795 ± 1.87
	V01	4.794 ± 1.75	4.564 ± 1.78
	V04	4.488 ± 1.81	4.354 ± 1.85
	V08	4.695 ± 1.78	4.413 ± 1.92
	V16	4.672 ± 1.82	4.48 ± 1.92
	V09	4.333 ± 1.86	4.223 ± 1.89
	All items (a component)	4.725 ± 1.81	4.624 ± 1.9

Source: Authors

The averages and standard deviations (Table 5) of responses recorded on a 7-point Likert-type scale indicate that Croatian and Romanian respondents score from 3.331 to 5.282 on CE items. That suggests moderate CE present for respondents in both countries. The mean values are higher for protectionism than for defensive patriotism. Although Croatian respondents have slightly higher scores on defensive patriotism and protectionism, it still lies within one standard deviation.

It can be concluded that CE is moderately expressed for Croatian and Romanian respondents. The following step is to check if CE factors relate to the preference of hotels regarding their affiliation to a domestic or an international chain.

The Spearman correlation was used to see if there is a statistically significant relationship between the two ethnocentrism factors and the preference for either a national or an international hotel (H2). The same statistical instrument was used to test the two factors and how important it is for the respondent if the hotel is part of an international chain (H3).

4.2 Correlation analysis

The results of the analysis showed that for the Romanian sample there is a significant weak positive correlation between "defensive patriotism" and the preference for a national hotel ($r_s(712)=0.241$, $p<0.001$). It also shown that that there is a significant weak negative correlation between "protectionism" and how important it is for the respondent if the hotel is part of an international chain ($r_s(712)=-0.158$, $p<0.001$), and a significant weak positive correlation with the preference for a national hotel ($r_s(712)=0.250$, $p<0.001$). The results are summarized in Table 6.

Table 6 Correlation coefficients for the Romanian sample

Spearman correlation		Importance of the hotel belonging to an international chain	Preference for either national or international hotels
Defensive patriotism	Correlation coefficient	-0.071	0.241**
	Sig. (2-tailed)	0.057	<0.001
Protectionism	Correlation coefficient	-0.158**	0.250**
	Sig. (2-tailed)	<0.001	<0.001

** Correlation is significant at the 0.01 level (2-tailed), N=714
Source: Authors

The results of the analysis showed that for the Croatian sample there is a significant weak positive correlation between "defensive patriotism" and how important it is for the respondent if the hotel is part of an international chain ($r_s(830)=0.250$, $p<0.001$), and a significant weak positive correlation with the preference for either a national or an international hotel ($r_s(830)=0.279$, $p<0.001$). It is also shown that there is a significant weak positive correlation between "protectionism" and the preference for either a national or an international hotel ($r_s(830)=0.339$, $p<0.001$). The results are summarized in Table 7.

Table 7 Correlation coefficients for the Croatian sample

Spearman correlation		Importance of the hotel belonging to an international chain	Preference for either national or international hotels
Defensive patriotism	Correlation coefficient	0.250**	0.279**
	Sig. (2-tailed)	<0.001	<0.001
Protectionism	Correlation coefficient	0.014	0.339**
	Sig. (2-tailed)	0.685	<0.001

** Correlation is significant at the 0.01 level (2-tailed), N=832
Source: Authors

4.3 The differences in consumer ethnocentrism components and hotel preferences between two age groups (H1)

Because both countries were under the communist regime until 1989 (1990), the authors wanted to test if there is a significant difference in preference for an international or a national hotel between buyers who reached a specific operational stage in the communist period and those who reached that stage after the communist era. The respondents were divided into two groups (under the age of seven in 1989 (1990) and over the age of seven). An independent sample t-test was performed. The results for both the Romanian and the Croatian sample show that buyers who grew up in the communist era had a significantly greater preference for national hotels than buyers who grew up after the communist era (Table 8). Furthermore, customers who grew up in the communist era had significantly higher ethnocentrism scores on defensive patriotism and protectionism than those who grew up in the post-communist era. This is true for the Romanian and the Croatian sample (Table 8).

Table 8 Independent sample t-test results for hotel preference and ethnocentrism

Variable	Era	Romania		Croatia	
		Mean/ St. dev.	Sig.	Mean/ St. dev.	Sig.
Hotel preference	Communist	M=4.19, SD=1.879	t(549.533)=3.385, p=0.001	M=4.64, SD=1.738	t(801.921)=4.069 p<0.001
	Post-communist	M=3.74, SD=1.554		M=4.16, SD=1.657	
Defensive patriotism	Communist	M=0.348, SD=1.030	t(574.340)=7.920, p<0.001	M=0.194, SD=0.951	t(830)=5.295, p<0.001
	Post-communist	M=-0.242, SD=0.904		M=-0.168, SD=1.012	
Protectionism	Communist	M=0.243, SD=0.914	t(669.452)=5.635, p<0.001	M=0.090, SD=0.958	t(830)=2.420, p=0.016
	Post-communist	M=-0.169, SD=1.023		M=-0.078, SD=1.030	

Source: Authors

5. Discussion and conclusion

Several conclusions may be drawn based on the study results. When asked what they prefer when choosing a hotel, more than 40% of Romanian respondents preferred to remain neutral. Slightly more of them (32.2%) prefer international hotels. In Croatia, almost 42% of the respondents prefer a national hotel, followed by those with a neutral opinion, and just 25% prefer an international one. For most Romanian and Croatian respondents, it is not entirely or very important if the hotel belongs to an international chain (over 80%).

The research confirmed the CETSCALE two-dimensionality (Hsu & Nien, 2008). For both Croatia and Romania, the research yielded two components for CE, i.e. "defensive patriotism", which discourages the purchase of foreign products, and "protectionism", which encourages the purchase of domestic products. The mean values are higher for protectionism than for defensive patriotism. Croatian respondents have slightly higher average scores on defensive patriotism and protectionism than Romanian respondents, but they still lie within one standard deviation.

CE is moderately expressed for Croatian and Romanian respondents. This means that CE is not going towards a troublesome level for most respondents in both countries, indicating well-balanced globalization and nationalism trends in the observed countries (Weaver et al., 2023).

Even though there is a difference in preference for a hotel, respondents from both countries with higher defensive patriotism and protectionism scores prefer a hotel belonging to a national rather than an international (foreign) chain when engaging in domestic tourism (H2). Kock et al. (2019) showed that tourism ethnocentrism affects tourists' willingness to participate in domestic tourism, their recommendation for domestic tourism, and local support for the growth of domestic tourism. The results of this research also relate to the previously revealed regularity that ethnocentric consumers prefer buying national rather than foreign goods and services (Siamagka & Balabanis, 2015). The same is now confirmed for the hotel choice of the observed respondents in two countries, contributing to closing a research gap in that area. From the perspective of domestic tourism, this might explain the low shares of hotels associated with international chains in Romania and Croatia.

However, previous research (Hauge, 2012) showed that consumers prefer domestic products in developed countries and foreign products in developing countries. In relation to that finding, our research indicates that either Croatian and Romanian respondents show the same tendencies as respondents from developed countries or the previously established pattern of behaviour between respondents from developed and developing countries diminished. Many respondents from both countries support national hotels and accommodation options because they offer a unique and authentic experience of the local culture, history and hospitality.

Defensive patriotism is positively correlated with the importance of the hotel as part of an international chain in the Croatian sample (H3), while it is not statistically correlated with the importance in the Romanian sample. This might be due to factors like brand recognition as international hotels have a global reputation for quality and consistency or diversity of options because international chains offer a variety of properties, from budget-friendly to luxury resorts. Nevertheless, hotel choice depends on individual preferences and priorities.

In the case of Romania, respondents with a higher protectionism score consider hotels belonging to an international chain as less important than national ones. This is an expected behavior as people that show higher levels of protectionism encourage the purchase of domestic products. However, there was a lack of the expected negative correlation between the components of CE and the importance of a hotel belonging to an international chain. No statistically significant relationship was observed between defensive patriotism and the above importance in the case of Romania, and between protectionism and the above importance in the case of Croatia. While the lack of CE (or, in this case, the lowest values on the scale) indicates a polycentric consumer that presumably perceives foreign hotels as more favorable (Shimp & Sharma, 1987; Chang & Cheng, 2011), these findings do not unequivocally support such approach. Polycentric consumers might evaluate hotels by other criteria, such as quality, performance, and price (Bawa, 2004), but not necessarily by their association with an international chain.

Customers who reached a specific operational developmental stage in the communist era had higher ethnocentrism scores on defensive patriotism and protectionism than those who grew up in the post-communist era (H1). Buyers from both countries who reached that developmental stage before 1989 (1990) prefer national hotels more than those who reached that stage after 1989 (1990). This can be explained by the fact that young people and private sector workers are more individualistic because they have socialized for a shorter period during the communist regime (Mungiu-Pippidi, 2002). Consumers in post-communist societies have created a series of pragmatic interests, triggered by the new open market system (Jong et al., 2011). Even though not directly comparable, the results for Croatia differ from Kvasina et al.'s (2018) results, which found younger people to have more pronounced CE than older people. That is an indication of regional differences within the countries. This means that Stoenescu and Căpățînă's (2015) suggestion for the creation of competitive advantage via the image of the country of a brand projected to the public should probably target the regional or even the local public image.

Market analysis should be done, regardless of whether it is an international hotel chain that wants to enter a new market or a local hotel that wants to differentiate itself. Companies should adapt their marketing strategies based not only on Hofstede's cultural distance (Fleșeriu, 2014), but also taking into account consumer ethnocentric tendencies. CE is relevant for global positioning, market entry decisions, and the materialization of country-of-origin effects (Siamagka & Balabanis, 2015). Moderate consumer ethnocentric tendencies for

respondents in both countries indicate balanced but present CE. National chains in both countries should increase their visibility and recognizability as national/domestic chains. That could contribute to awareness and loyalty of domestic tourists. Moreover, domestic chains should primarily target older customers, while international chains should seize the opportunity of lower ethnocentric tendencies of younger customers.

However, the data date back before the COVID-19 pandemic. Since a relationship between the perceived COVID-19 infectability and tourism ethnocentrism was shown by Kock et al. (2020), which indicates a potential change in consumer behavior due to the pandemic, the levels of CE should be re-checked in both countries. In such case, the results presented here can serve as a pre-COVID-19 baseline.

The geographical area and the sample limit the research conclusions. Further research should be done on a larger sample in a more general geographical area. Another research limitation is the ceteris paribus assumption. Namely, when examining preferences between hotels belonging to national and international chains, other choice criteria (such as quality and price, Bawa, 2004) were disregarded. That opens new questions, for example, as to whether the relationship between consumer ethnocentrism and preference for domestic hotels holds for different levels of quality and price. In addition, other demographic characteristics (in addition to age) can play a role in hotel choice along with consumer ethnocentrism, which remains for further investigation. Some other factors that can be considered in future studies are education, gender, income, marital status, etc. Further research should strive to model ethnocentric consumer behavior in tourism and generalize revealed relationships, including demographic and socio-psychological factors.

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Review article

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WHAT ARE THE FACTORS THAT DETERMINE RISK-ADJUSTED RETURNS OF CROATIAN LIFE INSURERS?

Abstract

Purpose: When conducting their business, insurers face various risks that are controlled for in order to mitigate them and protect the insured, inter alia. Moreover, being aware of the factors that determine the reward-to-risk ratio for insurers is also of crucial importance. Thus, the aim of this research is to identify potential factors that influence risk-adjusted returns of life insurance companies.

Methodology: The analysis is conducted on a sample of life insurers that operated in Croatia in the period from 2016 to 2020. For this purpose, risk-adjusted ROA, i.e. the Sharpe ratio, is used as a risk-adjusted return measure, while independent variables encompass several insurance firm-oriented and insurance industry-specific variables, as well as variables depicting the level of macroeconomic development, stock market, bond market and institutional development.

Results: After conducting dynamic panel analysis, the obtained results suggest that the premium growth rate, asset-based size, the net premium to surplus ratio, i.e. leverage, as well as bond market development are significant factors when determining risk-adjusted returns.

Conclusion: Risk-adjusted returns are determined by insurance firm-oriented factors which are important not only to investors but also to insurance market regulators and insurance firm managers.

Keywords: Risk-adjusted returns, life insurers, Croatia

1. Introduction

The importance of the role of insurance business is reflected in the provision of economic protection contributing to the development of the financial system and economy of a country. Insurance firms are an important part of the Croatian financial system with a share of 6.47% in the total assets of all financial institutions in 2021, after commercial banks and mandatory pension funds (Croatian Insurance Bureau, 2021a). However, when observing the share of the life insurance premium in total premiums, which was 25.27% in 2020 (Croatian Insurance Bureau, 2021b), it is evident that it significantly lags behind the EU average of 53% (Insurance Europe, 2020a). Moreover, the share of the life insurance premium in GDP in 2020 in Croatia was 0.73% compared to the EU average of 3.96%, while insurance density was EUR 88, lagging behind EUR 1,178 realised in the EU (Insurance Europe, 2020b).

Although insurance "contributes to financial stability, including by providing long-term sources of funding to other institutions and by promoting risk management through the pooling and diversification of risk" (IAIS, 2019), there are various risks inherent in insurers which need to be identified, addressed and managed. The legal framework regulating the insurance industry is constantly evolving with the aim of controlling risk-taking, mitigating risks of failure and protecting the insured (Gaganis et al., 2015). Although a relatively large number of studies deal with the determinants of insurers' risk (Baranoff & Sager, 2003; Chen et al., 2010; Cheng et al., 2011; Eling & Marek, 2014; Lee & Lin, 2016), the studies examining determinants of risk-adjusted returns are rather scarce.

Although there are papers dealing with determinants of the Croatian insurance market, they mostly employ accounting-based performance measures such as ROA and ROE (e.g. Ćurak et al., 2011; Kramarić et al., 2018; Pavić Kramarić et al., 2018). Moreover, since traditional performance measures fail to consider the risks of the underlying business (Crouhy et al., 1999), our study aims to determine the factors that influence risk-adjusted returns of life insurers. Specifically, distinguishing several attributes of insurer-oriented, industry-specific, stock market, bond market and institutional development as well as macroeconomic variables, the authors estimate the model using dynamic panel analysis in order to understand the factors that influence risk-adjusted performance of Croatian insurers. By measuring risk-adjusted returns with the Sharpe ratio, which takes into account profits but also their variability, the authors also consider insurer's risk tolerance. Empirical analysis covers 11 insurance companies including insurers conducting exclusively life insurance activities as well as the life segment of composite insurers that were active in the 2016-2020 period. Thus, our study adds to scientific thought given the fact that this is the first analysis of factors influencing risk-adjusted returns of insurance companies on the example of an emerging economy. The findings might be of interest to various stakeholders encompassing supervisory bodies, shareholders, managers, and the insured.

The rest of the paper is organised as follows. After the introductory part, theoretical and conceptual background is given in the literature review section. A methodology and data are provided in the third section. Furthermore, the fourth section presents empirical data and results, while a conclusion follows in the fifth section.

2. Literature review

Despite the fact that understanding determinants of insurers' reward-to-risk ratio is essential to regulators, investors and managers, as stated by Zhang et al. (2019), research dealing with determinants of risk-adjusted returns of insurers are rare, and the most prominent ones are presented below.

One of the studies dealing with risk-adjusted returns in the insurance industry is by Ma & Elango (2008) who investigate whether exposure to international markets improves risk-adjusted returns of property-liability insurers that operated in the 1992-2000 period. As a risk-adjusted return the authors employ risk-adjusted ROA by dividing insurer's ROA with its standard deviation. In addition to product diversification, several other explanatory variables are encompassed with the analysis such as market coverage, size, group dummy, stock insurer dummy, independent agency dummy, investments in common stocks, and usage of reinsurance. Their findings reveal that specialised insurers regarding product lines offered perform better in terms of risk-adjusted returns when they engage in international operations.

Gaganis et al. (2015) examine how regulations concerning capital requirements, technical provisions, investment restrictions, corporate governance and internal control, supervisory power and disclosure requirements affect profitability expressed with ROA and risk-adjusted returns expressed with a modified Sharpe ratio. Furthermore, a set of firm-specific attributes is also controlled for. Since they deal with European insurers from 18 countries, the authors also consider the macroeconomic environment they operate in, stock market development, overall quality of institutions and legal origins. Seven models are estimated for each dependent variable with one of the regulatory variables introduced alternately. In the models where the Sharpe ratio acted as a dependent variable, three regulatory requirements show statistically significant influence including capital requirements, technical provisions, corporate governance and the internal control index.

Another paper oriented to risk-adjusted returns in the insurance industry is by Shim (2017) who examines the effects of product diversification on risk-adjusted returns of US non-life insurers that operated in the 1996-2010 period. In particular, the author wants to find out whether the offering of multiple

products by financial firms such as insurers leads to the exploitation of economies of scope. This is done using a quantile regression method which reveals that product diversification negatively affects risk-adjusted returns in lower quantiles and vice versa. However, in addition to product diversification variables and its impact on different performance measures, the author employs control variables that include size, leverage, geographical diversification, asset growth, stock investment, industry concentration, reinsurance as well as dummy variables reflecting mutual, group, publicly traded shares and distribution system. The influence of control variables is not uniform but depends on the quantile as well as on the dependent variable used.

Consigli et al. (2018) introduce a dynamic stochastic programming formulation by analysing the implications for capital allocation, as well as risk-return trade-offs of an optimisation problem. Specifically, the authors introduce risk-adjusted returns containing investment value surplus (IVS) and return on risk-adjusted capital (RoRAC) in asset-liability management connecting "the definition of the optimal strategy to a sufficient return generation and an effective control of the risk exposure." (Consigli et al., 2018, p. 602). Using a global insurance company, the authors emphasise the effectiveness of applied dynamic stochastic programming which is relevant for both institutional investors and regulators.

Zhang et al. (2019) examine the impact of insurer-oriented financial attributes and executive compensation structures on both insurer risk and reward-to-risk. In order to measure reward-to-risk, the authors employ the Sharpe and Treynor ratios, while explanatory variables include profitability, liquidity, leverage, size, business growth, management compensation, type of insurer and major stock exchange. Their analysis is conducted for life, non-life and reinsurance companies altogether that were active in the 1992-2011 period. Among other things, their findings suggest that profitability and executive incentive pay positively affect the Sharpe ratio, whereas the opposite is true for the size variable.

3. Methodology and data

For the purpose of econometric data analysis, dynamic panel data analysis was employed in the research. The dynamic panel data was estimated using Arellano & Bond's (1991) estimator. The Arellano and Bond dynamic panel estimator with independent variables is shown by the following equation:

$$y_{it}=\mu+\gamma y_{i,t-1}+x'_{it}\beta+\alpha_i+\varepsilon_{it},\quad i=1,\ldots,N,\ t=1,\ldots,T\ , \tag{1}$$

where y_{it} is the dependent variable presented with risk-adjusted ROA or the Sharpe ratio, $y_{i,t-1}$ is a lagged dependent variable, x'_{it} is a matrix of type 1×K independent variables discussed below, α_i is an unobserved individual effect and e_{it} is an unobserved white noise disturbance, while γ and β are regression coefficients.

A risk-adjusted return represents the profit in terms of the amount of risk assumed to achieve it. The authors have opted for an approach proposed by Gaganis et al. (2015) and Shim (2017). Specifically, a risk-adjusted return is calculated as follows:

$$Risk-adjusted\ ROA=\frac{ROA}{\sigma ROA}\ , \tag{2}$$

i.e. as an insurer's ROA over a three year-varying standard deviation of ROA, where ROA represents an accounting-based measure of profitability calculated as net profit over total assets, while a standard deviation of ROA, calculated in a three-year window, reflects volatility of investment returns, with the larger the standard deviation, the wider the range of returns.

A three-year rolling window is used following the work of Cummins et al. (2017) and Pasiouras & Gaganis (2013), who deal with financial soundness expressed by the Z-score, the calculation of which requires, *inter alia*, the standard deviation of ROA.

The risk-adjusted return, known as the Sharpe ratio, expresses the profit of an investment relative to the degree of risk taken throughout the observed period. It is thought to be a suitable indicator of an insurer's risk due to the fact that it captures the total return volatility (Shim, 2017). Firms experiencing greater volatility in their profits achieve lower values of risk-adjusted returns (Ma & Elango, 2008). With all else being equal, the higher the risk-adjusted ROA, the better.

Based on the relevant literature, the authors have identified a set of firm-oriented, insurance industry-specific, stock market, bond market and institutional development variables as well as macroeconomic variables that might explain a significant portion of variations in risk-adjusted returns. These are size, premium growth, leverage, a share of premium in GDP, stock market capitalisation, bond

market development, institutional development variables and GDP per capita growth.

The size of an insurer, calculated as the natural logarithm of total assets (SIZE), is employed in the analysis following e.g. Ma & Elango (2008), Gaganis et al. (2015), and Zhang et al. (2019). Larger insurers may exploit economies of scale, experience lower volatility of claim costs and face lower risks (Shim, 2017; Camino-Mogro & Bermúdez-Barrezueta, 2019; Killins, 2020), and, according to Zhang et al. (2019), these are the reasons why larger insurers achieve a greater reward-to-total-risk. Therefore, a positive sign of this variable might be expected. A positive impact of the size variable on the risk-adjusted return was found by Ma & Elango (2008), Gaganis et al. (2015), whereas Zhang et al. (2019) provide evidence of its negative impact on the Sharpe ratio.

Business growth can be presented with asset growth but due to the fact that the focus of our analysis is on insurers, we decided that business growth should be presented with premium growth (prem_growth). It is calculated as the percentage change in gross written premium of an insurer in each year using the following formula:

$$premium\ growth = \frac{GWP_t - GWP_{t-1}}{GWP_{t-1}} * 100 \quad (3)$$

While exploring determinants of risk-adjusted returns, Zhang et al. (2019) also employ business growth expressed as the percentage change in net premium earned. If insurers are characterised with healthy business growth, they "are more likely to be financially strong and perceived as less risky by investors due to improved cash-flow performance and added economic value" (Zhang et al., 2019, p. 9), and a positive impact on risk-adjusted returns can be expected. Nevertheless, the same authors also note that companies with higher business growth require more capital and resources to sustain that growth, adding that higher uncertainty and costs of capital increase their vulnerability. Moreover, since Chen & Wong (2004) add that insurers that strictly focus on growth might neglect other important goals, which would consequently result in self-destruction, a negative sign of this variable can also be expected.

The leverage ratio (LEV) is included in the analysis as net premium to policyholder surplus following Shim (2017). As stated by Shim (2017, p. 8), "if the insurers issue new policies that generate additional liabilities, they must be supported by surplus due to regulatory capital requirement". Leverage expressed as net premiums to policyholder surplus negatively affects insurers' financial soundness, as found by e.g. Shim (2015) and Cummins et al. (2017), since lower values of net premium to policyholder surplus is perceived as financial strength. Since "customers of financial intermediaries are strongly risk-averse to firm default risk and customers are willing to pay higher premium for safer firms" (Shim, 2017, p. 8), a negative influence of this variable is expected.

In order to reflect the level of life insurance market development, the share of premium in GDP (PREM_in_GDP) is employed in the analysis following the papers of Pasiouras & Gaganis (2013) and Cummins et al. (2017). These authors expect that more developed insurance markets will experience greater financial soundness. Thus, a positive influence of this variable on the risk-adjusted return can be expected as well.

Stock market capitalisation represents the share of market capitalisation in GDP (STOCK_CAP) with the aim of controlling for stock market development. Citing Demirgüç-Kunt & Levine (1996), Gaganis et al. (2019, p. 108) add that "large stock markets are more liquid thus offering the ability to mobilise capital and diversify risk". Moreover, in an environment characterised by increased stock market activity, a firm's preference for equity over debt increases (Ramli et al., 2019) enhancing firm's performance. However, Gaganis et al. (2015) find its negative impact on risk-adjusted returns represented with the Sharpe ratio. Such finding can be rationalised with the fact that in the case of greater stock market development, insurers might invest in more volatile types of assets including stock resulting in higher standard deviation of ROA (Shim, 2017). Thus, the expected sign of this variable is ambiguous.

Since insurance firms are considered as very conservative long-term investors and in order to take into account specifics of the Croatian insurance market, the level of bond market development (BOND) is employed in the analysis as well. Specifically, the share of investments in bonds amounted to 66.3% in the insurers' asset structure (Croatian Insurance Bureau, 2021b). The level of bond market development is expressed by total bonds outstanding issued on both the domestic and the international market as a percentage of the country's GDP (Burger & Warnock, 2006). Since debt instruments are consid-

ered to be a less risky form of investment compared to equity investments such as stocks and might be more reliable and consistent over a number of years, a positive sign of this variable is expected.

In order to capture the institutional setting, we include an institutional development variable (INST_DEV) that encompasses several different governance features including voice and accountability, political stability, government effectiveness, regulatory quality, rule of law and corruption control. The average of these six factors was also used in Gaganis et al. (2015) who investigated risk-adjusted returns and found their impact on the Sharpe ratio to be either insignificant or positive. Since according to the Worldwide Governance Indicators project reports, governance implies, among others, the capability of the governments to effectively create and implement sound policies as well as the respect of the state and its citizens for the institutions that carry out economic and social interactions among them, we also expect a positive sign of this variable. Institutional development is also used by e.g. Gaganis et al. (2019), who explore risk-taking and national culture, Cummins et al. (2017) and Rubio-Misas (2020), while investigating financial soundness of insurers.

GDP per capita growth (GDP_pc_growth) is encompassed with the analysis in order to capture the macroeconomic environment the insurers operate in. Gaganis et al. (2015) find a statistically significant and positive impact of this variable in all estimated models.

The data necessary for conducting such analysis are collected from multiple sources. In order to calculate insurer-specific variables, data from unconsolidated annual reports were collected either through publicly available insurer corporate websites or the Financial Agency (FINA). The data on market capitalisation of listed domestic companies expressed as percentage of GDP as well as data on GDP per capita growth are retrieved from the World Bank database (World Bank 2021a; 2021b), while the insurance industry-oriented data regarding the share of premium in GDP stem from the European insurance industry database published by Insurance Europe. Data on total bonds outstanding necessary for the calculation of bond market development indicators are retrieved from the Croatian National Bank (2021). Furthermore, institutional development indicators are collected from the Worldwide Governance Indicators (World Bank, 2021c).

4. Empirical data and results

Descriptive statistics for all individuals in the research period considered are provided in Table 1.

Table 1 Descriptive statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
RISK-ADJUSTED ROA	55	4.87	9.02	-18.55	56.75
Prem_growth	55	1.53	18.14	-33.64	82.03
SIZE	55	20.68	1.38	17.57	22.16
LEV	55	0.88	0.48	0.33	2.43
STOCK_CAP	55	37.39	2.66	32.95	40.50
INST_DEV	55	0.44	0.01	0.43	0.45
PREM_in_GDP	55	0.79	0.04	0.73	0.84
BOND	55	62.02	3.86	59.13	69.75
GDP_pc_growth	55	0.47	4.20	-7.69	4.06

Source: Authors

The matrix of Pearson correlation coefficients was implemented to test the problem of multicollinearity. The correlation matrix for independent variables is shown in Table 2. Since the absolute value of the Pearson coefficient greater than 0.7 indicates a strong correlation between independent variables, it is evident that the multicollinearity problem occurs between the institutional development variable (INST_DEV) and GDP per capita growth and bond market development variables. Therefore, variable institutional development (INST_DEV) was omitted from further analysis.

Table 2 Correlation matrix

	RISK-ADJUSTED ROA	Prem_ growth	SIZE	LEV	GDP_pc_ growth	STOCK_ CAP	INST_ DEV	PREM_ in_GDP	BOND
RISK-ADJUSTED ROA	1.0000								
Prem_growth	-0.1048	1.0000							
SIZE	0.3013*	-0.1633	1.0000						
LEV	-0.0447	0.2717*	-0.0282	1.0000					
GDP_pc_ growth	0.1605	0.3700*	-0.1055	0.1828	1.0000				
STOCK_CAP	0.0708	-0.1984	-0.1424	-0.0749	-0.3153*	1.0000			
INST_DEV	0.175	0.3576*	0.0242	0.1999	0.9074*	-0.5209*	1.0000		
PREM_in_ GDP	0.0986	0.3727*	-0.3841*	0.2785*	0.6861*	-0.1417	0.6915*	1.0000	
BOND	-0.1597	-0.3409*	0.0618	-0.2051	-0.6044*	0.4224*	-0.9197*	-0.6039*	1.0000

*p<10%
Source: Authors

After examining the potential multicollinearity problem and omitting the institutional development (INST_DEV) variable from further analysis, the Arellano and Bond dynamic panel estimator was used in the research. Table 3 shows the results of dynamic panel data analysis. The Sargan test and Arellano-Bond test results for autocorrelation are also provided in the same table. Based on the p-value of the Sargan test, which is 0.3689, it can be concluded that the instruments are not correlated with the residuals and that there is no endogeneity problem in the model. Based on the p-value of the m2 test (the Arellano-Bond test for autocorrelation of the second order), which is 0.3359, the null hypothesis of no correlation is not rejected. Therefore, it can be concluded that there is no autocorrelation problem in the model.

Table 3 Parameter estimates of dynamic panel model

Variables	RISK-ADJUSTED ROA
RISK-ADJUSTED ROA L1	0.2666637*** (0.0725586)
Prem_growth	0.2809238** (0.1375816)
SIZE	-25.52818** (10.46226)
LEV	-17.33386* (9.507569)
GDP_pc_growth	-0.4932825 (0.3001593)
STOCK_CAP	0.8844465 (0.7356879)
PREM_IN_GDP	8.795477 (66.83263)
BOND	-0.8544198*** (0.3239708)
cons	570.1518** (282.0401)
Number of instruments	11
Number of groups	11
Sargan test	p-value = 0.3689
Arellano-Bond test for autocorrelation - order 2	p-value = 0.3359

*, **, *** Statistically significant at the 10%, 5%, and 1% level, respectively. Robust standard errors are in parentheses.
Source: Authors' calculation

As presented in Table 3, premium growth rate (prem_growth), size (SIZE), leverage expressed by the net premium to surplus ratio (LEV) and BOND variables are statistically significant factors when explaining risk-adjusted returns of Croatian life insurers. Specifically, the size variable based on total assets negatively affects risk-adjusted returns of Croatian life insurers.

Insurer size has a negative impact on risk-adjusted ROA, i.e. the Sharpe ratio, which indicates that larger life insurers do not operate as efficiently as their smaller counterparts. Despite the common view that larger insurers exploit economies of scale and consequently face a lower level of risk and improved risk-adjusted returns, such finding is not uncommon. In particular, this is also found by Zhang et al. (2019, p. 16), who explain the negative impact of size on the Sharpe ratio with the fact that "risk-oriented activities do not generate adequate profit to compensate the increased risk for larger… insurers."

The premium growth rate has a positive impact on risk-adjusted returns measured by the Sharpe index. According to the healthy business growth hypothesis suggested by Zhang et al. (2019), strong and stable business growth improves the reward-to-total risk ratio.

Moreover, leverage, expressed by the net premium to surplus ratio has a statistically significant and negative impact on risk-adjusted returns. Such finding is in accordance with authors' expectations. The negative sign of the leverage ratio is also found by Shim (2017, p. 22) suggesting "that insurers with lower premium-to-surplus ratios achieve higher risk-adjusted performance, possibly because risk-averse policyholders are willing to pay higher prices for safer insurers".

Contrary to our expectation, the level of bond market development negatively affects firm performance. This can be rationalised by the fact that the bond market is generally considered risk-free, thus, it comes with low yields. Interest rates on bonds are typically lower than stockholders require, which is especially true in a low-interest rate environment as it has been in recent years.

5. Conclusion

It can be said that research investigating factors that determine risk-adjusted returns in the insurance industry is still underdeveloped. Thus, this paper provides evidence of the factors exploring risk-adjusted returns in an emerging economy such as Croatia using a sample of 11 life insurers in the period 2016-2020. To this end, the authors estimate a dynamic panel model using a set of firm-oriented, industry-specific variables, stock and bond market development indicators as well as the macroeconomic variable. In particular, the findings reveal a negative impact of size based on total assets, leverage expressed as the net premium to surplus ratio, as well as the bond market development indicator, while premium growth proved to have a positive effect on risk-adjusted return represented by the Sharpe ratio.

Our research has certain limitations that are primarily reflected in the fact that the sample included in the analysis is relatively small, although it encompasses all insurers that deal exclusively with life insurance business and the life segment of composite insurers. Moreover, the analysis period is also rather short, but imposing a longer observation period could result in a loss of observations as not all life insurers would be present in the market for a longer period of time. Future research might address the non-life insurance segment to allow for comparability. Furthermore, since risk-adjusted returns might be affected by various factors, some other factors can be taken into account, depending on data availability. Moreover, it might be interesting to extend the sample to other insurance markets that are comparable in terms of the level of development with the aim of observing the specificities that affect their risk-adjusted returns.

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Book review

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BOOK REVIEW "PENSIONS FOR 21ST CENTURY"

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The pension system in modern society has several functions, the main ones being equal distribution of income of individuals and families throughout their lifetime, encouragement of individual and national savings, and the alleviation of poverty during old age and work inactivity. One of the most important goals of pension insurance is to maintain income of the elderly, and it seems that the programme has been quite successful in this regard. While the elderly were more often likely to belong to the relatively poor, today's indicators point to quite positive effects, that is, to a significant reduction in the poverty of the elderly.

In Croatia, until the beginning of the 2000s, there was only a public pension system of intergenerational solidarity and defined benefits. Therefore, expenses for current pensions were mainly financed from paid employee contributions. Such a pension system fell into a deep crisis because the existing paid contributions could not finance the costs of pension expenditures. This is why pension reforms were implemented, most notably the introduction of mandatory and voluntary capitalized pension insurance. The knowledge on the characteristics and complexities of the pension system in Croatia has been relatively limited.

It can be judged that the situation in this regard has changed significantly with the publication of the book *Pensions for the 21st century*, by the well-known author and economic analyst Velimir Šonje. Thanks to the financial support of the Raiffeisen pension fund, the book is available online for free. The book is a rearranged selection of a series of the author's texts that were published from spring 2021 to spring 2022 on the website arhivanalitika.hr.

In the brief introductory remarks, the author recalls that the extension of life expectancy is a civilizational success, but it still creates some serious difficulties related to higher allocations for pensions. He thoughtfully warns that possible panic when discussing pensions does not make sense, but one should think carefully and propose possible solutions to preserve the pension system. Šonje warns that he tried to provide knowledge in a simple and comprehensible way about important professional issues of pension insurance that are discussed in scientific publications and at round tables. However, probably due to the complexity of the topic, the general public is not sufficiently involved in it, and it can be judged that the majority of citizens are still insufficiently familiar with the observed topics.

The book consists of six chapters. In the first chapter, Šonje considers the effect of aging and long-term demographic and economic changes. At the same time, he shows how changes in the population structure affect the system of intergenerational solidarity (the first pillar) and how this system is fi-

nanced. Since the contributions are only sufficient to cover a little more than half of the pension expenses, the resulting shortfall is financed by transfers from the central state budget or by state borrowing on the domestic or foreign financial market. Thus, the pension system became one of the most important causes of a budget deficit of the central government, which accumulates over the years into public debt. Šonje explains it very vividly using the example of fictional countries and possible parliamentary debates on how to secure the necessary funds for pension expenditures. Politicians in both countries, averse to unpopular measures and unwilling to raise pension contribution rates, easily get into debt. Therefore, they shift the burden of their extravagance (or recklessness) to the young or even more often to the unborn generations, who, of course, are not represented by anyone nor can they participate in the vote. It seems that the repayment of the principal can be postponed indefinitely, but it is quite obvious that the time of political security and macroeconomic stability as well as cheap money for borrowing has passed. Therefore, it is necessary to think very carefully how to reconcile the irreconcilable: to ensure a decent retirement age and not to increase (or at least to do so as little as possible) the burden of pension contributions and borrowing. Although *small steps* such as technological progress, increased productivity and employment of elderly people who have retired are important and praiseworthy, they alone cannot solve the problem of pension adequacy. The situation can be somewhat improved by significant immigration of the population, but even that is not enough, some new measures are needed.

The necessary new measures are discussed in the second chapter titled *Pension systems: savings and investments*. Šonje points out that public pension insurance and individual savings are necessary because individual fully funded pension insurance is an important instrument that cannot replace the public pension system based on the principles of social security and intergenerational solidarity (p. 44). The author very nicely and comprehensibly explains how a 27% supplement is included in the pension, which until recently (2019) was only possible for people who were not insured in capitalized insurance, even though they paid pension contributions to the first pillar of intergenerational solidarity throughout their entire working life. Although it is a fairly obvious view that due to the aging of the pension system the new generations finance to the greatest extent numerous older generations who are now retired (intergenerational redistribution), it is mostly ignored that in this system funds are redistributed from those who live shorter (mainly men) to people who live longer (women). At the same time, the importance of intragenerational redistribution from people who had relatively high salaries and worked long hours and therefore paid a large amount of pension contributions in total to those who earned little and worked for a short time, and therefore paid little, is almost always forgotten. While there is no maximum limit on salaries, there is a limit on the maximum amount to which contributions are paid as well as fairly strict provisions on the maximum pension amount. According to the provisions of the Law, the maximum pension is calculated by multiplying the total length of service by 3.8 value points and the starting factor, whereby it must not exceed two amounts of the maximum pension for 40 years of service. In any case, there are serious systemic errors in the system of intergenerational solidarity, so reforms were necessary to preserve pension insurance.

With the aforementioned reforms, the second pension pillar of capitalized fully funded pension insurance was adopted in Croatia, which is explained in more detail in the third chapter of the book. This form of insurance is often subject to (insufficiently argued and/or incorrect) criticism that the important role of insurance, which was traditionally performed by the state, is left to private initiative. Although investment liberalization was implemented in 2014 and different investment strategies are allowed for A, B or C pension fund categories that differ according to membership and principles, especially investment risk, the insured are mostly inactive and remain in medium-risk B funds. Therefore, Šonje correctly emphasizes that the insureds in the second pension pillar hold the keys to the allocation of funds and the relationship between risk and expected return in their hands through the choice of fund category, but they rarely use this option. A capitalized pension insurance system in shorter time periods can achieve weaker or even negative returns, but in a longer time period the returns are very good, and costs and fees are constantly decreasing. Of course, this does not mean that further regulatory improvements are not needed, especially since mandatory capitalized insurance pension funds have not left the Croatian

capital market, but due to their small size, they are actually turning into risk capital funds, for which the legal definition is not well adapted. The author is fully aware that the development of the Croatian capital market will not happen by itself, but in addition to improving the financial literacy and information of the insured persons, it will also be necessary to implement complex and decisive measures such as the abolition of the capital gains tax and some other activities.

The third pillar of voluntary capitalized pension insurance is the subject of the author's interest in the fourth chapter of the book, and he points out that this form of insurance is an opportunity that should not be missed. Šonje believes that there is a high level of complementarity between the third pillar of insurance and the first and second pillar, whereby incentives are intended to attract those savers into the system who want to save safely with returns that are comparable to returns in other forms of savings. Although around 400,000 people are now covered by this form of insurance, the average amount saved is quite small and is less than €3,000. At the same time, it should not be ignored that there are tax incentives for companies that pay pension savings to their employees or members, and there is no income tax on pensions from the third pillar.

In the fifth chapter, Šonje shows that the payment of a pension is not only a technical issue, but also has a great significance for the overall pension insurance. The author very clearly explains seven main topics related to pension payments, mostly related to the selection of a pension insurance company in charge of paying pensions from personal capitalized savings and the complex decision of whether one should just return to receiving a pension from the public system of intergenerational solidarity. In 2021, slightly less than two-thirds of insured persons in the second pillar returned to the first, and only those who had higher salaries on average and saved more in the second pillar, which enables them to have a decent pension, remained. A possible mass return of insured persons to the first pillar means a dangerous future financial burden on the central government budget, from which transfers are allocated to cover total pension expenses.

The final sixth chapter contains proposals for improving the pension system. Šonje envisioned that chapter as a basis for a public debate on how to enable relatively generous and secure pension rights, without increasing at the same time the burden of public allocations and public debt that should be borne by future generations. Although it seems that there is no room and opportunities for significant improvements in pension insurance, Šonje presents a number of valuable and interesting, relatively simple proposals, whose acceptance could greatly improve the system. The author is deeply convinced that despite the aging of the population, the Croatian pension system can improve the living standards of pensioners while maintaining fiscal sustainability, but the system needs to be constantly adjusted and improved. In this, this book can be of great importance, especially in terms of opening a reasoned public debate and better informing the general public about the state and determinants of pension insurance in Croatia.

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