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The Impact of Tax Structure on Economic Growth: New Empirical Evidence from Central and Eastern Europe

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ABSTRACT

This study aims to provide new evidence of the impact of total tax revenue and tax structure on economic growth in a sample of eleven European Union (EU) member states located in Central and Eastern Europe (CEE), namely Bulgaria, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The methods used are description, comparison, synthesis, regression and correlation analysis of annual panel data for the period 2000–2021. The ordinary least squares (OLS) method is used to estimate the parameters of the regression models. The causal relationship between the variables is confirmed by the Granger causality test. The main results indicate that there is a significant negative effect of total government spending on economic growth rate, while the total tax revenue has a positive impact. These findings suggest low efficiency of public spending. The structure of tax systems does not seem to hinder economic growth, as both direct and indirect tax revenues show a positive growth-supporting effect. Only social security contributions are estimated to have a detrimental impact on economic growth. Value added tax and both income taxes (personal and corporate) are found to be growth-conductive, while property taxes and excise duties seem to have no significant impact on the growth rate. Based on the research findings it is obvious that government expenditure is not an effective tool for positive fiscal impact on the economy, so policymakers can support economic growth by decreasing the share of public spending in GDP or by increasing its efficiency. It is recommended to maintain the current ratio between direct and indirect tax revenue, while carefully considering changes to social security systems to promote sustainable and inclusive growth.

KEYWORDS

tax revenue, tax structure, economic growth, Central and Eastern Europe (CEE)

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Влияние налоговой структуры на экономический рост: новые эмпирические данные из Центральной и Восточной Европы

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АННОТАЦИЯ

Наше исследование направлено на предоставление новых доказательств влияния налоговых поступлений и налоговой структуры в части прямого и косвенного налогообложения на экономический рост в выборке из 11 государств-членов Европейского союза, расположенных в Центральной и Восточной Европе, а именно в Болгарии, Хорватии, Чехии, Эстонии, Венгрии, Латвии, Литве, Польше, Румынии, Словакии и Словении. Используются методы описания, сравнения, синтеза, регрессии и корреляционного анализа годовых панельных данных за период 2000–2021 гг. Для оценки параметров регрессионной модели используется метод наименьших квадратов. Причинно-следственная связь

между переменными подтверждается тестом причинно-следственной связи Грейнджера. Основные результаты свидетельствуют о значительном негативном влиянии совокупных государственных расходов на темпы экономического роста, в то время как совокупные налоговые доходы оказывают положительное влияние. Эти данные свидетельствуют о низкой эффективности государственных расходов. Налоговая структура не препятствует экономическому росту, поскольку как прямые, так и косвенные налоги демонстрируют положительный эффект, поддерживающий экономический рост. По нашим оценкам, пагубное воздействие на экономический рост оказывают только взносы на социальное обеспечение. Установлено, что налог на добавленную стоимость и подоходный налог (личный и корпоративный) способствуют росту, в то время как налоги на имущество и акцизы, по нашему мнению, не оказывают существенного влияния на темпы роста. Исходя из результатов исследования, очевидно, что государственные расходы не являются эффективным инструментом положительного фискального воздействия на экономику, поэтому политики могут поддерживать экономический рост за счет снижения доли государственных расходов в ВВП или повышения их эффективности. Рекомендуется поддерживать текущее соотношение между прямыми и косвенными налогами, тщательно рассматривая при этом изменения в системах социального обеспечения для содействия устойчивому и инклюзивному росту.

КЛЮЧЕВЫЕ СЛОВА

налоговые доходы, налоговая структура, экономический рост, Центральная и Восточная Европа

1. Introduction

The impact of taxation on economic growth is a key issue of fiscal policy, especially for small open economies like the new member states of the European Union (EU) located in the Central and Eastern Europe (CEE), namely Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia.

A modern tax system is expected to be effective and efficient, ensuring sound public finances and contributing to social justice and fair distribution of income, while promoting competitiveness and growth. The relationship between taxation and growth has been broadly discussed in both theoretical and empirical research. While government spending is generally expected to support growth, taxation is believed to cause distortions and have a negative impact on economic development.

Neoclassical growth theory postulates that higher taxes can discourage saving, investment, and entrepreneurial activity, thereby hindering long-term economic growth. Lower tax burden, on the other hand, is expected to incentivize productive behavior and stimulate GDP growth.

At the same time, endogenous growth theory suggests that the impact of taxation on growth is much more nuanced. It argues that well-designed tax policies that fund public goods, infrastructure, and human capital development can positively influence productivity, innovation, and overall economic growth.

In this regard, the composition of taxes, such as the share of direct versus indirect taxes, is also expected to affect economic growth. Numerous studies suggest that indirect taxes on consumption tend to have a less detrimental impact on growth than direct taxes on income and wealth, which can discourage savings and investment.

The purpose of the study is to examine the impact of total tax revenue and tax structure on economic growth in a sample of eleven countries from Central and Eastern Europe (namely Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia) for the period 2000–2021.

This paper tests the following three hypotheses:

H1: Total tax revenue has a negative impact on economic growth.

H2: Direct taxes and social security contributions have a negative impact on economic growth.

H3: Indirect taxes have a positive impact on economic growth.

The study is structured in six sections. After this brief introduction, the second section examines classical and contemporary scholar knowledge on the impact of taxation on economic growth. Section three describes the methodological framework and data used in the study. The fourth section presents the main results of the study. The fifth section compares our findings with the evidence provided by prior research on the topic. The last section draws conclusions and policy implications.

2. Literature Review

Numerous empirical studies have examined the relationship between total tax burden and economic growth, employing various methodologies, covering different time periods and focusing on different countries or regions. However, no consensus about the nature and significance of such a relationship has been reached.

This is not surprising, given that the relationship between tax burden and GDP growth is complex and multifaceted. While some studies find a positive association, suggesting that increased tax revenues can support public investments and spur economic growth, others highlight the importance of efficient public expenditure management and the avoidance of excessive tax burdens (particularly on labor and capital) that may hinder private sector activity.

Certain studies suggest that higher tax burden can act as a constraint on economic growth.

Engen & Skinner [1] analyzed data from 107 countries for the period 1970–1985 and found that a balanced-budget increase in taxation and government spending reduces output growth rates.

An econometric panel study conducted by Folster & Henrekson [2] on a sample of rich countries covering the 1970–1995 period found that both taxation and public spending are negatively associated with economic growth.

Chu et al. [3] applied ordinary least squares (OLS) and generalized method of moments (GMM) techniques on panel data from 37 high-income and 22 low-to-middle-income countries covering the period 1993–2012. As expected, they revealed a significant negative impact of increased levels of government expenditure and tax revenue on growth.

Koester & Kormendi [4] analysed data from 63 countries and identified clear negative effects of tax rates on growth.

This is further supported by a recent study by Kaneva et al. [5], who also argued that the overall tax burden is harmful for the GDP per capita growth rate in Baltic States and Central European countries over the period 2000–2021.

Another confirmation is provided by Pradhan [6], who found that the effect of taxation on economic growth is negative in a panel of middle-income countries over the period 1960–2017.

Ozpençe & Mercan [7] applied vector autoregression (VAR) and Granger causality test and found a negative impact of tax burden on economic growth in Turkey for the period 1970–2018.

Çollaku et al. [8] used VAR and vector error correction model (VECM) to examine the relationship tax revenues – economic growth in Kosovo over the period 2010–2021 and found negative long-run effects.

At the same time, there is a number of studies that challenge these results.

A recent study by Tanchev & Mose [9] employed a panel ordinary least squares (OLS) technique with a fixed effect estimation method for the period 1995–2020 and argued that the increase in tax revenue and government expenditure leads to an increase in economic growth in 28 EU countries.

This is further confirmed by Spulbar et al. [10], who applied structural equation modeling (SEM) technique and revealed that the level of taxation has a positive influence on GDP dynamics in the EU-28 member states for the period 2005–2017.

Pradhan et al. [11] found that taxation contributes to the long-run economic

growth in both the OECD and non-OECD countries over the period 1961–2019.

Kalaš et al. [12] analyzed taxes and growth in the United States over the period 1996–2016 and found a strong positive relationship between tax revenue and economic growth.

A positive impact of taxation on growth is identified by Gashi et al. [13], who applied regression analysis on 2007–2015 time series data for Kosovo.

Similar results are observed by Krysovaty et al. [14], who revealed a positive correlation between the tax burden and GDP growth in Ukraine.

Alzyadat & Al-Nsour [15] applied VAR and VECM on annual data for the period 1970–2019 and found a short-term positive impact of tax revenues on economic growth in Jordan. However, the effect turned to negative in the long term.

A study by Moyo et al. [16] applied the autoregressive distributed lag (ARDL) model and found that tax revenue has a significant positive relationship with economic growth in South Africa for the period 1991–2018.

It is interesting to note that there are findings disputing the existence of a clear and evident relationship between tax burden and economic growth.

A study by Easterly & Rebelo [17] analyzed a dataset of a broad cross-section of countries for the period 1970–1988 and concluded that the effects of taxation are difficult to isolate empirically. They believe that main fiscal variables are highly auto-correlated (e.g. countries with higher tax burden also have higher public spending), so the empirical results are fragile and it is difficult to find a distinct relation between government size and growth.

These conclusions are further supported by Oyinlola et al. [18], who applied the GMM estimation technique on 1995–2015 data for 27 sub-Saharan African countries and found that taxation does not have a significant impact on growth.

Agell et al. [19] share a similar view. They argue that some of the estimated correlations between size of the public sector and economic growth are statis-

tically insignificant and highly unstable across specifications. They concluded that cross-country growth regressions are unlikely to come up with a reliable finding for the growth effects of taxation and government spending.

Another set of studies argues that the composition of taxes, such as the share of direct versus indirect taxes, affects economic growth. Research suggests that reliance on indirect taxes, like consumption taxes, tends to have a less negative impact on growth compared to direct taxes, which can discourage savings and investment.

Myles [20] reviewed the findings on the topic and supported the claimed that a shift from income taxation to consumption taxation would raise the growth rate.

An OECD study [21] also argued that taxes on corporate and personal income are the most detrimental to growth, while taxes on consumption and property are considered less harmful.

Dackehag & Hansson [22] report similar results. They found that both taxation of corporate and personal income negatively influences economic growth in 25 rich OECD countries over the period 1975–2010.

Arnold [23] also conducted a set of panel growth regressions for a sample of 21 OECD countries over the period 1971–2004 and found that property taxes are the most growth-friendly, followed by consumption taxes, while personal income taxes and corporate income taxes appear to have the most negative effects on growth.

This is further confirmed by McNabb [24], who concluded that increases in income taxes are associated with lower long-run GDP growth in a panel of 100 countries.

Oz-Yalaman [25] used a panel VAR for 29 OECD countries over the period 1998–2016 and found that corporate tax rate has a significant negative effect on economic growth.

Balasoju et al. [26] used panel data from EU-27 countries covering the period 2008–2020 to investigate the impact of direct taxation on economic growth. Applying fixed effect models and dynamic GMM methods the study found that cor-

porate income taxes and personal income tax have negative effects on growth.

Hakim [27] used the GMM estimation in a panel of 51 countries over the period 1992–2016 and concluded that tax structure based on direct taxes such as taxes on income, profit and capital gains is harmful to the economic growth, yet more efficient in terms of collecting the tax revenue in a country.

Neog & Gaur [28] investigated the relationship between tax structure and economic growth in India for the period 1980–2016 applying ARDL model. They found that personal income tax, corporate income tax and excise duties are harmful to the long-run growth.

Examining Turkey from 2006 to 2018, Korkmaz et al. [29] employed the ARDL approach and found a significant positive impact of indirect taxes, as well as a significant negative impact of direct taxes on economic growth.

Moreover, according to a series of reports by the European Commission [30], [31] there has been a general trend in some EU member states to shift the tax burden from direct to indirect taxation, and in particular from taxes on labor and capital to taxes on consumption.

In contrast to these findings, Bernardi [32] performed an aggregated analysis of tax trends across euro area (EA-17) countries, and a disaggregated, country-by-country analysis, with regard to the 2000–2014 period. He found that the gains from a tax shift (from direct to indirect taxes) do not appear to be as straightforward as claimed by the previous researches. On the contrary, he predicts that the tax shift may exacerbate the economic slump spreading across the EU, particularly as an effect of the general adoption of restrictive fiscal policies by almost all member countries.

Canavire-Bacarreza et al. [33] evaluated the effect of different tax instruments on growth for Latin American countries using VAR techniques and panel data estimation. They found that personal income tax does not have the expected negative effect on economic growth. For corporate income tax, their results suggest reducing

tax evasion and greater reliance on collection may boost economic growth in the region. The reliance on consumption taxes has significant positive effects on growth in Latin America in general, although they found slight negative effects in some of the selected countries.

Stoilova [34] studied the impact of taxation on the economic growth in the EU-28 member states for the period 1996–2013 through regressions on panel data. She found that imposing value added tax affects negatively EU-28 economies and concluded that a tax system based on selective consumption taxes, taxes on personal income and property is more supportive to the economic growth.

Ahmad et al. [35] used time series data for the period 1976–2011 to investigate the impact of tax revenue on economic growth of Pakistan and concluded that direct taxes should be increased (rather than indirect taxes) to support the economic prosperity of the country.

Chugunov et al. [36] estimated the impact of government revenue on economic growth in Ukraine for the period 2014–2018 using a correlation-regression analysis and the multiplier effect concept. The authors substantiated that the increased share of direct taxes is growth-conductive, whereas the increased share of indirect taxes causes decrease of the real GDP.

The main conclusion of the literature review is that there is a wide variety of classical and contemporary empirical studies, but they do not reach a consensus on the nature, direction and significance of the relationship between the total tax burden and economic growth. Economic logic suggests that a higher tax burden can discourage saving, investment, and entrepreneurial activity, thereby hindering economic growth, but some findings show that the impact of taxation on growth is not so straightforward, but much more nuanced.

The impact of the tax structure on growth has also been extensively studied using various methods and covering different time periods and samples of countries. Although there are findings

that point in opposite directions, it seems that most studies identify direct taxes as hindering economic growth, while indirect taxes are generally estimated as less harmful.

3. Methodology and data

This research uses descriptive and comparative analysis as well as correlation and regression analysis on panel data to study the impact of total tax burden and tax structure on economic growth in a sample of eleven EU member states located in the region of Central and Eastern Europe (CEE), namely Bulgaria, Czech Republic, Estonia, Croatia, Latvia, Lithuania, Hungary, Poland, Romania, Slovenia and Slovakia.

As a basis of the regression model is accepted the endogenous model proposed by Barro [37] and further developed by Davoodi and Zou [38], who concluded that the long-term economic growth rate is a function of the taxation and the shares of spending by different levels of government.

Our empirical study follows the common approach applied in most of the researches on this topic. The conventional simple specification tries to explain the economic growth by government expenditure and tax revenues, so the regression equation (1) has the following structure:

$$y_{it} = b_0 + b_1 TS_{it} + b_2 TR_{it} + \varepsilon_{it} \quad (1)$$

The dependent variable (y_{it}) is the annual growth rate of GDP of country i in year t , measured as a percentage change on the previous period. The independent variables are the total government spending to GDP for each country and year (TS_{it}) and the total revenue from taxes and social contributions presented as a ratio to GDP for each country and year (TR_{it}). The parameters of the model are b_0 , b_1 , and b_2 . The symbol of ε_{it} marks the error term.

This simple specification is further extended to take into account different types of government revenue (direct taxes on income and wealth, indirect taxes on consumption and social security contributions) as well as a variety of taxes (value

added tax, excise duties, personal income tax, corporate income tax, property taxes).

Thus, the variables included in the regression analysis are as follows:

GDP_GR $_{it}$ – growth rate of the real GDP of country i in year t (percentage change on the previous period);

GOV_EXP $_{it}$ – total government expenditure of country i in year t (percentage of GDP);

TAX $_{it}$ – total revenue from taxes and social contributions of country i in year t (percentage of GDP);

DIR_TAX $_{it}$ – direct tax revenue of country i in year t (percentage of GDP);

IND_TAX $_{it}$ – indirect tax revenue of country i in year t (percentage of GDP);

SSC $_{it}$ – social security contributions of country i in year t (percentage of GDP);

VAT $_{it}$ – revenue from value added tax of country i in year t (percentage of GDP);

EXCISE $_{it}$ – revenue from excise duties of country i in year t (percentage of GDP);

PIT $_{it}$ – revenue from personal income tax of country i in year t (percentage of GDP);

CIT $_{it}$ – revenue from corporate income tax of country i in year t (percentage of GDP);

PROP $_{it}$ – revenue from property taxes of country i in year t (percentage of GDP);

The panel ordinary least squares (OLS) method is used to estimate the parameters of the regression model. OLS estimations are reported in Table 1. Correlation coefficients between the main variables of the regression model are calculated and presented in the correlation matrix (Table 2). Hypotheses for bilateral causal relations are tested by Pairwise Granger Causality Test (Table 3).

The analysis is based on the official statistical annual data for the period 2000–2021 provided by the European Commission in the Eurostat database [39].

4. Results

One of the most important purposes of taxation is to finance government expenditure, so the total tax burden is largely related to public spending. During the analyzed period government spending in the selected CEE countries has a pronounced cyclical dynamics (Figure 1).

It is clear that the size of the public sector has increased during the major global crises, as government interventions have been needed to prevent the collapse of economic and social systems.

It is noteworthy that the size of government varies significantly across the selected CEE countries. As seen, Bulgaria, Romania, Estonia, Latvia and Lithuania demonstrate quite restrictive fiscal models, with the ratio of government spending to GDP rarely exceeding 40%. Public spending in Poland, Czech Republic and Slovakia varies in the range between 40% and

45% of GDP. Croatia, Hungary and Slovenia report the largest size of the public sector among the selected CEE countries. The total amount of public expenditure in these countries varies on average within 45–55% of GDP, which is around the EU-27 average for the analyzed period.

The average ratio of total tax revenue and social contributions to GDP in the EU-27 is relatively high (40.0%) due to traditional strong social protection, which requests higher levels of government spending and the associated tax burden (Figure 2).

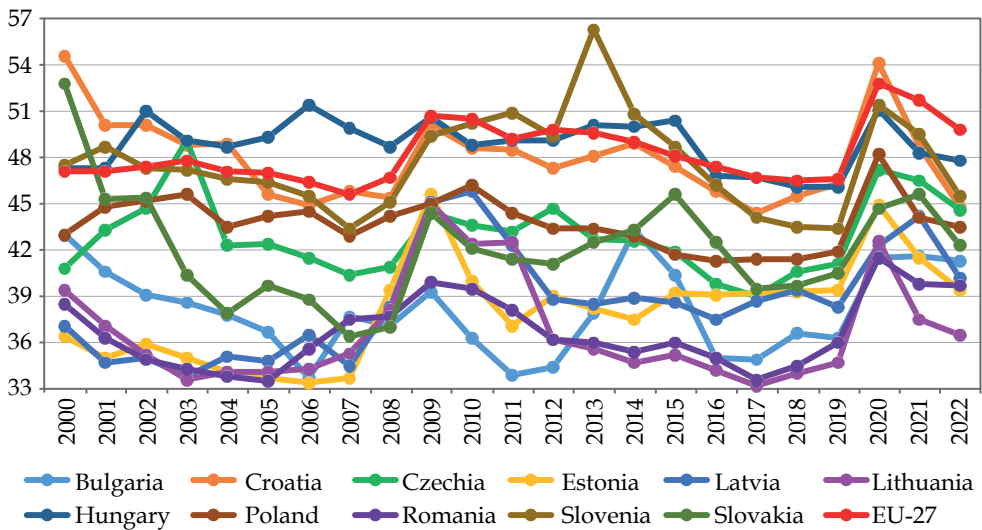


Figure 1. Dynamics of total government spending in the selected CEE countries (% of GDP)

Source: Eurostat database [39]

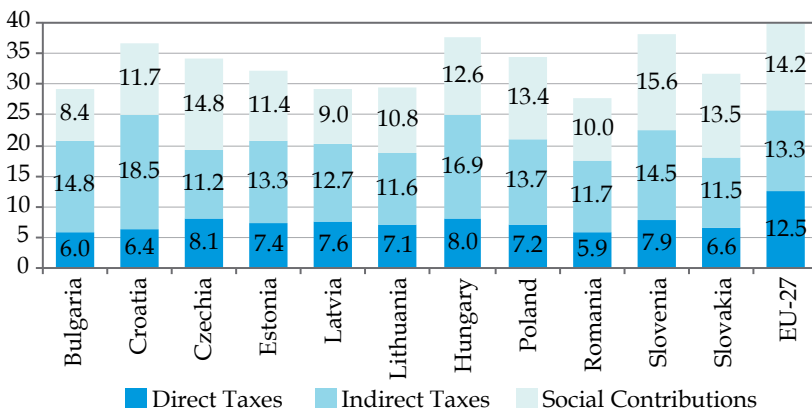


Figure 2. Distribution of total tax burden in the selected CEE countries, average for the period 2000–2021 (% of GDP)

Source: Eurostat database [39]

However, the tax burden in the selected CEE countries is generally lower than the EU-27 average as a result of the liberal economic reforms of the democratic transition. As seen, the total tax burden varies considerably from country to country. The lowest total-tax-to-GDP ratios are reported by Romania (27.6%), Bulgaria (29.2%), Latvia (29.3%) and Lithuania (29.5%), while the highest rates are observed in Croatia (36.6%), Hungary (37.5%) and Slovenia (38.0%).

During the analyzed period, the average tax burden in the EU-27 is close to the even distribution between direct taxes, indirect taxes, and social contributions. On average, receipts from social contributions amount to 14.2% of GDP, followed by indirect taxes (13.3% of GDP), while direct taxes account for 12.5% of GDP. Due to the different patterns of national tax systems, the importance of direct taxes, indirect taxes and social contributions varies widely from country to country in terms of revenue generated.

Specific to the selected CEE countries is the reliance on indirect taxes as the main source of revenue. As seen, all countries report lower than EU-27 average shares of direct taxes in GDP, while half of them register higher than EU-27 average levels of indirect taxes to GDP ratio. The lowest ratios of direct taxes to GDP among CEE countries (as well as among all EU member states) are reported by Romania (5.9%), Bulgaria (6.0%), Croatia (6.4%) and Slovakia (6.6%). The countries reporting comparatively high relative figures are Czechia, Hungary and Slovenia, which collect 7.9%-8.1% of GDP through direct taxes. The highest ratios of indirect tax revenue to GDP are recorded in Croatia (18.5%), Hungary (16.9%), Bulgaria (14.8%) and Slovenia (14.5%), while the lowest levels of indirect tax revenues are found in Czechia (11.2%), Slovakia (11.5%) and Lithuania (11.6%).

The results from the OLS estimations are reported in Table 1.

Separate specifications of the regression equation have been constructed by

different combinations of independent variables. As a starting point, the parameters of the regression are estimated under the simplest version of the equation (Model 1), which includes only total government spending and total tax burden as independent variables. In the subsequent models, the total tax burden is replaced by disaggregated tax revenue variables. Model 2 estimates the impact of direct taxes, indirect taxes and social security contributions, while Model 3 studies the influence of value added tax (VAT), excise duties, personal income tax (PIT), corporate income tax (CIT), social security contributions (SSC) and property taxes. The probability of the F-statistic confirms the adequacy of the applied models. The R-squared values indicate that, across models, 23–28% of the variations in the dependent variable is explained by the variation in the independent variables. The Durbin-Watson statistic indicates that there is no autocorrelation in the residuals from the regression analysis.

Contrary to conventional economic logic, the regression results show a significant negative impact of general government spending on the GDP growth rate, while tax revenue has a positive impact. These findings suggest low efficiency of public spending. It seems that the structure of tax systems in the selected CEE countries do not hinder economic growth, but government expenditure is not an effective tool for positive fiscal impact on the economic development.

Surprisingly, both direct and indirect tax revenues have a positive effect on GDP growth. Value added tax and both income taxes (personal and corporate) are estimated as growth-supportive, while social security contributions hinder economic growth. At the same time, property taxes and excise duties seem to have no significant impact on the growth rate.

The correlation matrix (Table 2) presents the correlations between each pair of variables, included in the regression model.

Table 1

Results from the regression analysis

Variable	Model 1	Model 2	Model 3
(Constant)	8.9680*** (4.1655)	8.8780*** (3.9750)	8.8315*** (3.7495)
GOV_EXP	-0.6270*** (-7.9766)	-0.6248*** (-8.5789)	-0.5922*** (-8.6430)
TAX	0.5170*** (5.1133)		
DIR_TAX		0.6362*** (3.2201)	
IND_TAX		0.7131*** (5.4560)	
SSC		-0.4945*** (-3.5944)	-0.4283*** (-3.0773)
VAT			0.9377*** (5.1904)
EXCISE			-0.1831* (-0.6539)
PIT			0.4293** (2.0443)
CIT			1.4254*** (4.9077)
PROP			0.4283* (3.0773)
R-squared	0.2319	0.2672	0.2835
Adjusted R-squared	0.2255	0.2548	0.2620
Akaike info criterion	5.3906	5.3602	5.3624
Schwarz criterion	5.4339	5.4323	5.4778
Durbin-Watson statistic	2.0095	2.0063	2.0099
F-statistic	36.0904	21.6046	13.2278
Prob(F-statistic)	0.0000	0.0000	0.0000
Observations	242	242	242

Source: Author's calculations

Notes: *t*-statistics shown in parentheses below coefficient; Asterisks (*, **, ***) indicate the significance level (10%, 5%, 1%) of the coefficients.

Table 2

Correlation matrix of the variables of the regression model

	GDP_GR	GOV_EXP	TAX	IND_TAX	DIR_TAX	SSC	VAT	EXCISE	PIT	CIT	PROP
GDP_GR	1.000	-0.412	0.222	0.089	0.082	-0.205	0.016	-0.143	0.082	0.024	0.045
GOV_EXP	-0.412	1.000	0.850	0.498	0.196	0.619	0.274	0.241	0.029	0.272	0.241
TAX	0.222	0.850	1.000	0.669	0.302	0.633	0.488	0.251	0.096	0.255	0.177
IND_TAX	0.089	0.498	0.669	1.000	-0.080	-0.011	0.871	0.542	-0.035	-0.061	0.298
DIR_TAX	0.082	0.196	0.302	-0.080	1.000	0.335	-0.167	-0.287	0.724	0.249	0.127
SSC	-0.205	0.619	0.633	-0.011	0.335	1.000	-0.152	-0.150	0.094	0.287	-0.008
VAT	0.016	0.274	0.488	0.871	-0.167	-0.152	1.000	0.353	-0.006	-0.204	0.098
EXCISE	-0.143	0.241	0.251	0.542	-0.287	-0.150	0.353	1.000	-0.286	-0.026	0.479
PIT	0.082	0.029	0.096	-0.035	0.724	0.094	-0.006	-0.286	1.000	-0.442	0.099
CIT	0.024	0.272	0.255	-0.061	0.249	0.287	-0.204	-0.026	-0.442	1.000	-0.304
PROP	0.045	0.241	0.177	0.298	0.127	-0.008	0.098	0.479	0.099	-0.304	1.000

Source: Author's calculations

Correlation coefficients between some of the independent variables exceed 0.2, indicating multicollinearity. The correlation analysis confirms that total government spending and economic growth are negatively correlated, while the correlation between total tax revenue and growth is positive. It is interesting to note that the correlations between both direct and indirect tax revenues and economic growth are positive but extremely weak. Social contributions and excise duties are negatively correlated with growth, while revenues from income taxes (PIT and CIT), property taxes and value added tax (VAT) demonstrate a weak positive correlation.

The results of Pairwise Granger Causality Tests (Table 3) confirm that there are bidirectional causal relationships be-

tween total government expenditure, total tax revenue and GDP growth rate.

Obviously, total revenues from indirect taxes as well as VAT and social contributions are also factors in economic growth. The null hypothesis cannot be rejected for the variables direct taxes, personal and corporate income taxes, property taxes and excise duties, so it seems that these variables do not clearly cause GDP growth.

5. Discussion

The results of the analysis do not confirm our first hypothesis that total tax burden has a negative impact on economic growth. Contrary to conventional economic logic, our findings show a significant negative impact of general government spending on the GDP

Table 3

Pairwise Granger Causality Tests

Null Hypothesis	Obs	F-Statistic	Prob.
GOV_EXP does not Granger Cause GDP_GR	220	2.09624	0.0024
GDP_GR does not Granger Cause GOV_EXP		7.90043	0.0005
TAX does not Granger Cause GDP_GR	220	0.76214	0.0179
GDP_GR does not Granger Cause TAX		1.54163	0.0364
IND_TAX does not Granger Cause GDP_GR	220	0.41313	0.0002
GDP_GR does not Granger Cause IND_TAX		8.83130	0.6621
DIR_TAX does not Granger Cause GDP_GR	220	0.46373	0.6296
GDP_GR does not Granger Cause DIR_TAX		2.67275	0.0714
SSC does not Granger Cause GDP_GR	220	0.10424	0.0071
GDP_GR does not Granger Cause SSC		5.07022	0.9011
VAT does not Granger Cause GDP_GR	220	2.10556	0.0072
GDP_GR does not Granger Cause VAT		7.48165	0.1243
EXCISE does not Granger Cause GDP_GR	220	0.39661	0.6731
GDP_GR does not Granger Cause EXCISE		0.13542	0.8734
PIT does not Granger Cause GDP_GR	220	1.65229	0.1940
GDP_GR does not Granger Cause PIT		2.64964	0.0730
CIT does not Granger Cause GDP_GR	220	2.17226	0.1164
GDP_GR does not Granger Cause CIT		2.87689	0.0585
PROP does not Granger Cause GDP_GR	220	0.30681	0.7361
GDP_GR does not Granger Cause PROP		8.46058	0.0823

Source: Author's calculations

Note: lags = 2

growth rate, while total tax revenue has a positive impact.

Surprisingly, both direct and indirect tax revenues appear to have a positive effect on GDP growth. VAT and both income taxes (personal and corporate) are estimated as growth-supportive, while social security contributions hinder economic growth. Property taxes and excise duties seem to have no significant impact on the growth rate.

These findings are consistent with our third hypothesis, which suggests that indirect taxes have a positive impact on economic growth.

The second hypothesis is partially confirmed, since only social security contributions have a significant negative impact on economic growth, while direct taxes, contrary to our expectations, are estimated to have a weak positive impact.

Although unconventional, our findings are supported by various authors. Confirmation for the negative impact of total government spending on growth is provided by Engen & Skinner [1], Folster & Henrekson [2], Chu et al. [3], Barro [37], Todorov & Durova [40].

Also, Esener & Ipek [41] found significant decreasing effects of public expenditure on economic growth by applying dynamic generalized method of moments (GMM) techniques to panel data for 33 middle-income countries for the period 1999–2014. Using linear regressions on panel data Cenc [42] found a negative impact of government spending on GDP growth in 19-euro area countries over the period 1995–2020.

Similar results were reported by Shaddady [43], who analyzed panel data from 19 Central Asian and Eastern European countries for the period 1995–2019 and found that government expenditure was negatively related to economic growth. This is further confirmed by Alfonso & Tovar [44], who analyzed empirical data for a sample of 108 countries covering the period 1970–2008 and suggested that economic growth is negatively affected by the size of government.

At the same time, there is a number of studies that challenge our results, such as

the works of Tanchev & Mose [9], Alzyadat & Al-Nsour [15], Moyo et al. [16], who found that government expenditure has positive growth-supporting effects. This is confirmed by Rubinson [45] who used cross-sectional data to form several samples from 7 to 91 countries and argued that higher government spending stimulates growth, especially in poorer and less developed economies. A study by Lin [46] also estimated that government expenditure has positive impact on economic growth for both developed and less-developed countries. Attari & Javed [47], Alzyadat & Al-Nsour [48], Hamza & Milo [49] also concluded that public spending has a positive effect on GDP growth in Pakistan, Jordan and Kosovo respectively.

Consistent with our findings, total tax revenues are identified as positively related to growth by the works of Tanchev and Mose [9], Spulbar et al. [10], Pradhan et al. [11], Kalaš et al. [12], Gashi et al. [13] and Krysovaty et al. [14], while Engen and Skinner [1], Folster and Henrekson [2], Koester and Kormendi [4], Kaneva et al. [5], Ozpence and Mercan [7] and Çollaku et al. [8] argue that total tax burden is harmful for the economic growth.

Confirmation of our results for the positive effects of direct taxes on the economic growth is found by Canavire-Bacarreza et al. [33], Ahmad et al. [35], Chugunov et al. [36] and Tanchev [50].

On the opposite side are the results of Dackehag & Hansson [22], Arnold [23], McNabb [24], Oz-Yalaman [25], Balasoiu et al. [26], Hakim [27], Neog & Gaur [28], who define direct taxes as growth-suppressing.

Similar to our findings, a significant positive impact of indirect taxes on growth is estimated by Korkmaz et al. [29], Canavire-Bacarreza et al. [33] and Szarowska [51], while Chugunov et al. [36] argue that the increased share of indirect taxes causes decrease of the real GDP.

Only a few studies have identified similar unidirectional effects of both direct and indirect taxes on growth. Consistent with our findings are the results of Hoang et al. [52], who analyzed data for

63 countries over the period 2003–2017 using the GMM and found that most taxes have a positive impact on economic growth in poor countries and taxes on goods and services promote economic growth in rich countries.

In contrast to our results, a study by Abd Hakim et al. [53] investigated the impact of taxation on the economic development of 47 developed and 90 developing countries covering the period 2000–2020 and concluded that both direct and indirect taxes have a significant negative relationship with economic development in developing countries. However, they found a significant positive relationship between direct taxes and economic development for developed countries. A study by Luo [54] also found that both distortionary and non-distortionary taxation is negatively associated with growth in a panel of OECD countries over the period 1980–2015.

Support for our results on the positive effect of VAT on growth is provided by the work of Ayoub & Mukherjee [55], who investigated the role of value added tax on the economic growth in China for the period 1985–2016 and found a significant positive relationship. Elshani & Pula [56] also argued that VAT had a positive effect on growth in Eurozone countries over the period 2002–2019. Omodero & Eriable [57] found that aggregate VAT revenue exhibits positive and strong causal effects on manufacturing output in Nigeria over the period 2010–2021. Nguyen et al. [58] applied regression analysis and concluded that value added tax has a positive effect on economic growth in the localities of Vietnam for the period 2007–2017. In contrast to these findings, Koroleva [59] concluded that VAT does not have a significant impact on economic growth in Russia.

Confirmation of the depressing effects of social contributions on economic growth is found in the work of Elshani & Pula [55], who concluded that social security contribution has a negative effect on GDP in the Eurozone countries during the period 2002–2019. On the opposite side are the results of Zhang &

Zhang [60], who estimate social security as growth conducive.

Like any research, our study has territorial and temporal limitations. The analysis covers the period 2000–2021 and is limited to the eleven new member state of the European Union located in Central and Eastern Europe.

6. Conclusions

The relationship between taxation and GDP growth is complex and multifaceted. It is crucial to develop tax policies that strike a balance between generating revenue and fostering economic growth. Well-designed tax systems that support public investments and social cohesion would promote economic growth, while an excessive tax burden spent on inefficient public programs would harm GDP growth.

The main results of the correlation and regression analysis of panel data from the selected CEE countries (Bulgaria, Czech Republic, Croatia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) for the period 2000–2021 show a significant negative effect of total government spending on economic growth rate, while the total tax revenue has a positive impact. These findings suggest low efficiency of public spending.

The structure of tax systems in the sample of CEE countries does not seem to hinder economic growth, as both direct and indirect tax revenues show a positive growth-supporting effect. Only social security contributions are estimated to have a detrimental impact on economic growth. Value added tax and both income taxes (personal and corporate) are found to be growth-conductive, while property taxes and excise duties seem to have no significant impact on the growth rate.

The study has several practical and research implications. Based on the research findings it is obvious that government expenditure is not an effective tool for positive fiscal impact on the economy, so policymakers can support economic growth by decreasing the share of public spending in GDP or by increasing its efficiency.

Regular evaluation of government expenditure programs and policies is important to identify inefficiencies and reallocate resources where they can have a greater impact on GDP growth. Policymakers should maintain the current ratio between direct and indirect tax revenue, while carefully considering changes to social security systems to pro-

mote sustainable and inclusive economic growth.

Further research is needed to explore the specific channels through which tax burden and tax structure impact GDP growth, particularly in different country contexts. Such insights can contribute to evidence-based policymaking and enhance overall economic performance.

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