

Article

Economic Determinants Concerning Corporate Tax Revenue

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Abstract: This study quantifies the impact of selected economic determinants on corporate tax revenues. The methodology applies a panel regression method with the 27 EU Member States considered for 2004–2020. This paper used a panel regression model with fixed effects, and the Arellano adjustment was used to achieve robust standard deviations. Source data were obtained from the European Commission, Eurostat, World Bank and Transparency International databases. Based on this hypothesis, we wanted to prove that the nominal tax rate, which is legislatively determined based on political consensus, is a decisive determinant of the amount of tax revenue. However, the analysis results reject this hypothesis, although the model showed it as positive but statistically insignificant. On the other hand, an interesting research result is that the analysis confirmed the effective tax rate as a significant determinant of tax revenues. From this, we can conclude that policies should be aimed at an effective tax rate or a better harmonisation of the nominal tax rate towards the effective rate.

Keywords: corporate tax revenues; trade openness; macroeconomic determinants; effective tax rate



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1. Introduction

Corporate tax revenue is a key source of government revenue that provides financing for public goods and services such as education, infrastructure, defence and others. Differences in tax revenues between member countries are currently a highly debated topic, as it is necessary to correctly determine the factors usually included in the specifications. Before we confirm or refute the evidence from professional studies in the empirical part, it is necessary to define why we started the discussion on the given issue. As mentioned, it is important to note that several factors influence the amount of corporate tax revenue governments collect. Studies on this issue have included several variables such as the specification of the tax base, the profitability of enterprises and the size of the enterprise sector in the economy, GDP per capita, the ratio of foreign direct investment to GDP, the ratio of total debt to GDP, and institutional factors such as the degree of political stability and corruption. We aim to explore and expand the given base with other factors that explain the differences in resource mobilisation in EU countries. At the same time, we expand the data set with a longer time horizon. More specifically, we will look at the determinants of tax revenues such as nominal and effective tax rate, foreign direct investment as the ratio of inflow and outflow of direct foreign investment, public debt as the ratio of debt to GDP, the inflation rate measured based on the harmonised index of consumer prices and the employment rate as the share of working-age employees, and we analyse to what extent these factors affect tax revenues. We solve potential econometric problems with the help of selected econometric models, which provide us with a detailed analysis of the investigated issue.

The main objective of this study is to analyse and evaluate the economic determinants of corporate tax revenues. Following this objective, this study is divided into six parts. The

introductory part follows a literature review focusing on the most important determinants. In the literature review, in addition to corporate taxation and corporate tax revenues, individual determinants and their impact on corporate tax revenues are discussed. The third part is dedicated to describing the data and methodology of the work, which will be used in the empirical research. It is a descriptive and comparative analysis and mainly a panel regression. There is also a description of the individual variables used. The fourth part describes the results of the analysis of the determinants of corporate taxation. The evaluation is processed in the discussion section, where our results are compared with those of other authors, and the study is closed with a conclusion.

2. Literature Review

The level of a country's corporate income is influenced by a combination of macroeconomic and other determinants that reflect the ever-changing economic situation in that country. Studies by [Andrejovská \(2019\)](#), [Tahlova and Banociova \(2019\)](#), [Karpowicz and Majewska \(2018\)](#), [Cung and Son \(2020\)](#) and [Cozmei \(2015\)](#) were focused on tracing the impact of economic determinants on tax revenues in different countries or country groupings at various time intervals around the world. Determinants influencing the level of corporate tax revenue include domestic and foreign tax policy. The simplest and most accessible fiscal instrument of this policy can be considered to be the nominal tax rate, which each country has set in its legislation.

It is the inappropriateness of using nominal rates as an objective indicator in tracking and then comparing corporate taxation rates that have led to the derivation of the effective tax rate, which has substantially better predictive power, note [Baker and McKenzie \(1999\)](#), [Barrios et al. \(2009\)](#) and [Inkabova et al. \(2021\)](#). The level of the tax rate, which substantially affects the tax burden in the form of nominal, effective and average tax rates, is essential information not only for investors but also for policymakers and economists ([Banociova and Tahlova 2019](#)). The correlation results of [Kawano and Slemrod \(2016\)](#), expressing the relationship between corporate tax rates and tax revenues for OECD countries between 1980 and 2004, suggest that an increase in implicit tax rates maximises corporate profits. The relationship between tax rate and tax revenue has also been discussed by [Clausing \(2007\)](#), [Devereux \(2007\)](#), [Devereux and Griffith \(1998, 2003\)](#). In their results, the authors conclude that a higher tax rate increases tax revenue, while a negative reciprocal relationship between tax rate and tax revenue can be established. In relation to investment, the tax rate has a negative dependence. The negative effect on tax revenue has also been confirmed for inflation. [Cung and Son \(2020\)](#) found that if inflation rises above a certain level, it will cause a decline in consumption, purchasing power of money, investment and production, which will have a negative impact on tax revenues but also on overall economic growth. The results confirmed that a 1% increase in inflation would cause a reduction of VND 540.1337 billion (Vietnamese dong) in corporate tax revenue.

The impact of inflation on corporate tax revenues could be complex and depends on several factors. In general, however, inflation may negatively rather than positively affect corporate tax revenues ([Balzer et al. 2020](#)). The negative effect was confirmed by [Tahlova and Banociova \(2019\)](#) when examining tax revenues and unemployment rates. The authors assume that the higher the unemployment rate, the greater the corporate sector's profitability decline, ultimately resulting in lower corporate tax revenues. In the case of the new Member States of the European Union, the unemployment rate also has a decisive negative impact. A 1% increase in this variable causes a EUR 128.921 million decrease in corporate tax revenue ([Andrejovská 2019](#)). Further evidence of a negative impact on tax revenues also applies to the determinant of corruption.

Cung and Son's observation results ([Cung and Son 2020](#)) suggest that corruption can reduce the efficiency of tax systems by reducing taxpayers' trust in the government, reducing tax compliance, and increasing tax evasion. The results also indicate that countries with high levels of corruption tend to have lower tax revenue collection relative to GDP. On the other hand, a positive reciprocal relationship has been found between tax revenue and

GDP (Kubátová and Říhová 2009; Bánociová and Pavliková 2013). This interdependence was investigated by Vasiliauskaite and Stankevicius (2009) using Spearman's correlation coefficient and cluster analysis on a sample of EU Member State data. Their results also showed that the level of the GDP indicator is positively influenced mainly by tax revenue effects. The relationship between foreign investment, tax rates and corporate tax revenues has been considered by Gropp and Kostial (2000) and Bënassy-Quééré et al. (2000). Both analyses prove that FDI is sensitive to differences in tax rates. Gropp and Kostial (2000) also find that this effect is more statistically significant for countries that exempt foreign income from taxation. Camara (2023) notes that FDI inflows can contribute to revenue mobilisation by broadening the taxpayer base and generating higher tax revenues by promoting investment and employment opportunities. Clausing (2007) proved the positive impact of GDP and FDI on corporate tax revenues based on regression analyses. However, a sharper parabolic relationship between tax revenues and rates has also been demonstrated in the case of FDI. The author explains this through a larger increase in tax revenue at low rates and, conversely, a larger decrease in tax revenue at high rates. Cozmei (2015) concludes that higher net FDI inflows relative to GDP increase countries' corporate tax revenues. Trade openness was included as an indicator variable in the analysis by Tahlova and Banociova (2019). The authors hypothesised that trade openness has the potential to achieve higher corporate tax revenues. This assumption was subsequently confirmed via the analysis performed. Also, Cozmei (2015) concluded that the industry turnover index positively affects the ratio of corporate tax revenue to GDP. Clausing (2007) uses the industry turnover index as a proxy for a company's financial performance in his research. His results show that this index and the GDP variable have a positive and statistically significant effect on corporate tax revenue.

While an increase in corporate income taxes may generate more revenue for the government, it could also have far-reaching consequences on various aspects of the economy, including production across different sectors, income distribution among households, prices of goods and services, and overall welfare. According to a study by Bhattarai et al. (2019), the impacts of direct and indirect tax reforms on the economy are quite interesting. The authors analyse how corporate taxes affect revenue collection and the economy. In a separate study, Bhattarai et al. (2017) also examine the implications of corporate taxes in an advanced economy.

According to the studies reviewed, the economic determinants examined negatively or positively affect corporate tax revenues. Our objective was to quantify this impact and determine whether the nominal rate, as an objective indicator for monitoring and comparing the level of business taxation, is a decisive factor in determining the level of tax revenue.

3. Methodology

This paper aimed to empirically verify the impact of selected economic determinants of corporate taxation, which significantly affect corporate tax revenues in the European Union countries for the period of 2004–2020, and then use selected econometric models to investigate the impact of selected variables on the size of corporate tax revenues. The analysis of the determinants of corporate taxation in the European Union countries was performed in 27 countries for the period of 2004–2020. The first part describes the evolution of the dependent variable corporate tax revenue as a percentage of each country's GDP over the observation period. The second part consists of creating a model using the regression analysis method. Three methods are used to generate the model estimation: Pooled OLS regression, fixed effect method and random effect method.

To investigate the impact of economic variables in relation to corporate tax revenue, we set the following research hypothesis in this paper:

H0: *The statutory (nominal) tax rate is a crucial variable that significantly affects the level of corporate tax revenue.*

The selected economic determinants affecting corporate taxation were divided into tax rates, macroeconomic indicators, and business performance indicators. Their selection was conditioned by the theoretical findings of Andrejovská (2019), Cung and Son (2020), Teera and Hudson (2004), Tanzi and Davoodi (2012), Wigger and Wartha (2004), Tosun and Abizadeh (2005), who have studied a considerable number of determinants affecting corporate tax revenues in different countries and periods. The first area includes the nominal and effective and the personal income tax rate, since, according to the authors, this rate also impacts corporate tax revenues. We have decided to include the difference between this and corporate tax rates in the analysis.

The second group of observations consisted of our selected macroeconomic indicators: GDP, inflation, FDI, unemployment, government debt, and trade openness. Although these variables do not directly affect corporate tax revenue (such as the tax rate), their values ultimately affect the level of our explanatory variable. In addition to these variables, we will consider a less traditional indicator, the Corruption Perceptions Index. The last group of variables represents enterprises' performance in the countries concerned. Specifically, these are the Industry Turnover Index and Business value added by industry. We have included mining, quarrying and production turnover in the analysis to ensure that these indicators cover all companies. For value-added, we also include all industries or all activities according to the NACE classification. Table 1 shows and further characterises the definitions of each variable under study.

Table 1. Overview and description of variables.

Variable	Unit	Source	Description
Response Variable			
Corporate tax revenues	% GDP	The European Commission	Taxes on corporate income or profits, including holding gains (as a percentage of GDP).
Explanatory Variable			
Nominal tax rate	%	The European Commission	Highest statutory rates of corporation tax (including surcharges).
Effective average tax rate	%	The European Commission	Effective average tax rates of large corporations in the non-financial sector calculated using the Devereux/Griffith methodology.
Gross domestic product per capita	EUR per capita	Eurostat	Ratio of real GDP to average population in a particular year at constant prices (2010).
Harmonised Index of Consumer Prices	%	Eurostat	Harmonised Consumer Price Index, for international comparison of consumer price inflation, measured as an annual average index and rate of change.

Table 1. *Cont.*

Variable	Unit	Source	Description
Foreign direct investment	% GDP	The World Bank	Net inflows of foreign direct investment coming from non-resident investors expressed as a ratio to GDP.
Unemployment	%	Eurostat	Annual unemployment rate by gender (male and female) and age (15–74 years), measured as a percentage of the population in the labour force.
Public debt	% GDP	Eurostat	Ratio of outstanding public debt at year-end to gross domestic product at current market prices.
Individual tax rate—Corporate tax rate	%	The European Commission	The difference between the maximum individual and corporate income tax rates.
Trade openness	% GDP	The World Bank	The sum of exports and imports of goods and services measured as a share of gross domestic product.
Corruption Perception Index	Score	Transparency International	Corruption Perception Index on a scale from 0 (highly corrupt country) to 100 (very clean country).
Industrial Turnover Index	Score	Eurostat	Annual data for sales of own-account services and goods in mining, quarrying, and manufacturing (calendar-adjusted, not seasonally adjusted, index 2015 = 100).
Value added	% GDP	Eurostat	Gross value added and income by industry (all activities according to NACE classification).

Source: Own elaboration.

Before conducting the actual panel regression analysis, we initially assessed the presence of stationarity, heteroskedasticity, serial autocorrelation, and cross-sectional dependence in the model. We performed the tests at a significance level of $\alpha = 0.05$. Based on the Augmented Dickey–Fuller Test and the Phillips–Perron Unit Root Test, which were

used to test the stationarity of the data from 2004 to 2020, the variables under examination were found to be non-stationary during this period. This may indicate a strong trend and seasonality in the data. Therefore, we decided to transform the variables using the natural logarithm and repeat the tests. After the transformation, we can observe that the only variable that remains non-stationary in the model is trade openness. We conducted the heteroskedasticity test using the Breusch–Pagan test, which confirmed our assumption of constant variance of residuals in the model, indicating the presence of heteroskedasticity. Furthermore, in the model, we identified the presence of serial autocorrelation using the Breusch–Godfrey/Wooldridge test. The Pesaran CD test did not confirm the presence of cross-sectional dependence.

The model form we chose to use in our panel analysis is as in Equation (1). Table 2 defines our expected effects of variables on corporate tax revenues.

$$\begin{aligned} CITREV_{it} = & \beta_1 TR_{it} + \beta_2 ETR_{it} + \beta_3 GDPpc_{it} + \beta_4 HICP_{it} + \beta_5 FDI_{it} + \beta_6 U_{it} \\ & + \beta_7 GD_{it} + \beta_8 ITR_{it} + \beta_9 TO_{it} + \beta_{10} CI_{it} + \beta_{11} ITI_{it} \\ & + \beta_{12} VA_{it} + u_{it} \end{aligned} \quad (1)$$

Table 2. Variable and expected effect.

Name	Determinant	Expected Effect
Response Variable		
Corporate tax revenues	CITREV	
Explanatory Variable		
Nominal tax rate	TR	+
Effective average tax rate	ETR	+
Gross domestic product per capita	GDPpc	+
Harmonised Index of Consumer Prices	HICP	+
Foreign direct investment	FDI	+
Unemployment	U	—
Public debt	PD	—
Individual tax rate—Corporate tax rate	ITR	+
Trade openness	TO	+
Corruption Perception Index	CI	+
Industrial Turnover Index	ITI	+
Value added	VA	+

Source: Own elaboration.

4. Results

4.1. Evolution of Corporate Tax Revenues over Time

For the sake of clarity in the graphical representation of the data, we have chosen to display them for both the old and new member states of the European Union as a whole. We will consider ‘old countries’ those that became members before 2004, and conversely, those that joined the EU after 2004 will be regarded as ‘new countries’. The categorisation of countries will thus be as follows:

Old EU member states: Belgium, Denmark, Finland, France, Greece, Netherlands, Ireland, Luxembourg, Germany, Portugal, Austria, Spain, Sweden, Italy.

New EU member states: Bulgaria, Cyprus, Czech Republic, Estonia, Croatia, Lithuania, Latvia, Hungary, Malta, Poland, Romania, Slovakia, Slovenia.

Regarding the evolution of corporate tax revenues, we will first examine the development of the heterogeneity of this variable (Figure 1). Average corporate tax revenues for all EU countries remained around 3% of GDP during the observed time horizon, with the variance ranging between 2% and 5% of GDP throughout the entire observed period. Before the crisis year of 2008, we observed an increase in the average value, as well as in the heterogeneity of the variable. After this year, there was a decline in the tax revenues

of countries, and the variance of values remained wide. Between the years 2010 and 2014, the values and their variances remained at approximately constant levels. Subsequently, from 2015 onwards, there was a slight increase in corporate tax revenues, followed by a slight decline.

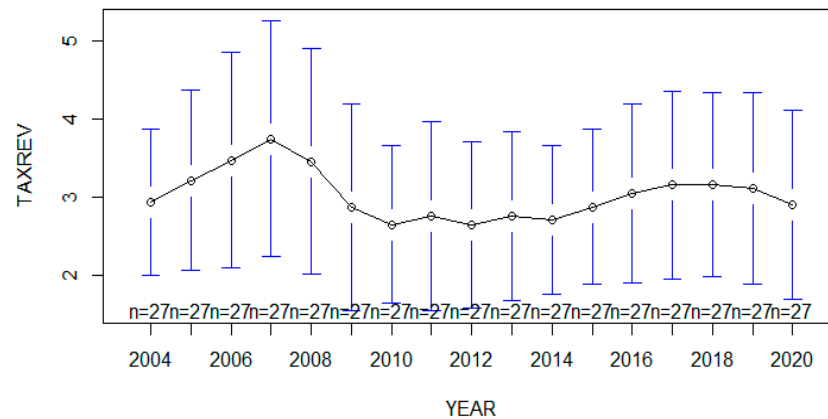


Figure 1. Heterogeneity of corporate tax revenues (% of GDP) in EU countries from 2004 to 2020. Source: own elaboration.

In addition to average values, we will also examine the values of individual countries. For better visualisation, we will focus on the percentage representation of corporate tax revenues for the years 2004 and 2020 (Figure 2). In this comparison, Croatia stands out significantly in both years, where they have corporate tax revenues accounting for 13.57% (in 2004) and 17.06% (in 2020) as a share of this country's total tax revenues, calculated as a percentage of GDP. In addition to being 3–8 times higher than in other EU countries, we also observe a growth over time. One possible explanation for significantly higher corporate tax revenues in Croatia compared to other EU countries could be Croatia's tax policy. Although the tax rate in this country was at 18% in 2020 (which is lower than the EU average of 21.5%), it is offset by a relatively broad tax base, resulting in more companies being subject to taxation. Another factor could be the economic structure of Croatia. In this country, there is a relatively high share of state-owned companies, which tend to generate higher profits and, consequently, higher taxes. Additionally, one of the most significant sectors is tourism, which, during the main season, can also contribute to higher corporate income tax revenues. Since this indicator is constructed as the ratio of corporate tax revenues to GDP, it is important to note that Croatia does not achieve a high GDP per capita compared to other EU countries. Thus, the fact that the observed indicator is at a high level may still mean that the actual amount of generated corporate tax revenues could be lower than in wealthier countries. The second country with the highest share is Luxembourg, where the values are already around 5% of GDP, but there has been a decrease of nearly one percentage point over time. The most significant decline in values occurred in the cases of Finland, Hungary, Greece, and Spain, where we observed a decrease of around 1.5% of GDP. In the case of the other EU countries, there were no significant changes observed over the years; there were only slight increases or decreases, with corporate tax revenues remaining around 2–3% of GDP. If we were to focus on countries with the lowest corporate tax revenues as a percentage of GDP, these would be Romania, Latvia, and Germany. In the case of Latvia and Germany, values of 0.71% of GDP and 0.72% of GDP were observed in 2020, respectively. Throughout the entire observed period, Romania had the lowest tax revenues, and there was also a decline over time. In 2004, it was at a level of 0.07% of GDP, and in 2020, it was at 0.01% of GDP. Compared to Croatia, these values are significantly different. This is very interesting, especially considering that in 2020, the tax rates in these countries were not very different (18% in Croatia and 16% in Romania). However, the difference in corporate tax revenues as a percentage of GDP is substantial. We assume that the low corporate tax revenues in Romania may be due to its smaller and less developed economy

compared to that of other EU countries. The size of the corporate sector in this country is smaller, and even the most widespread industries are not among the most profitable, which can result in lower tax revenues. Another issue could be the country's level of compliance with tax regulations and a history of corruption. Despite efforts to improve tax collection and reduce tax evasion, Romania still has a relatively high level of tax evasion, which can lead to lower tax revenues because some companies may not pay their fair share of taxes. Additionally, the level of the Corruption Perceptions Index was at 44 in 2020, whereas for comparison, the EU average stands at 64.

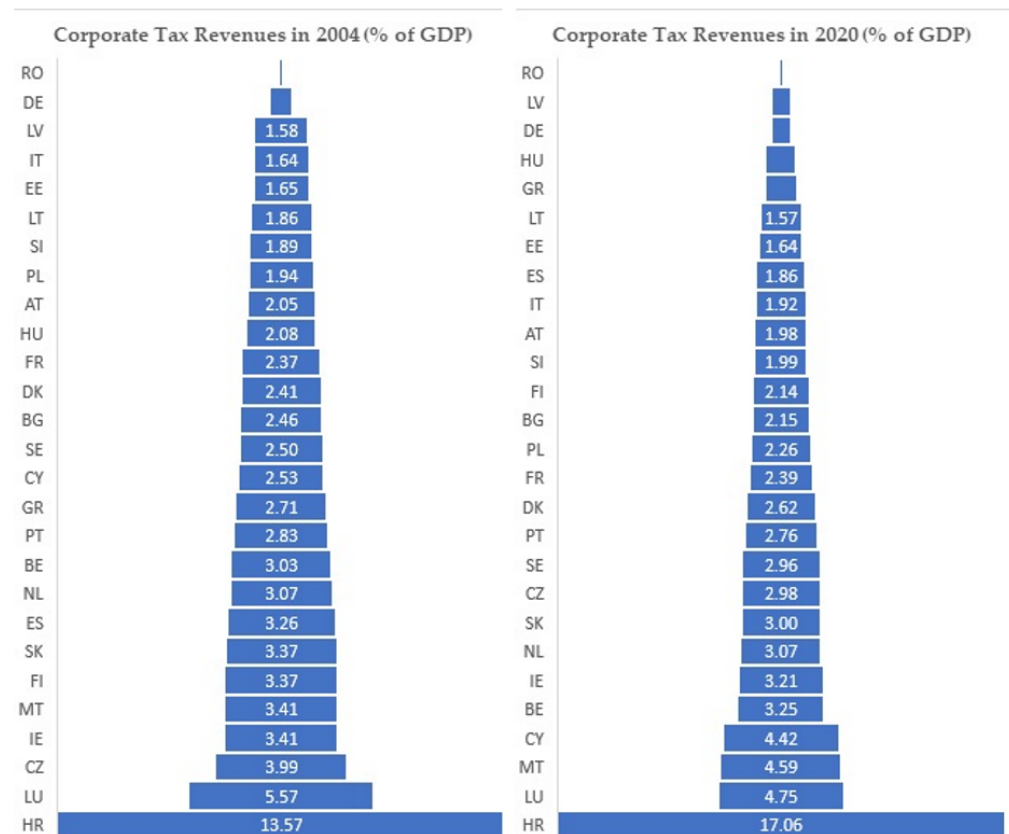


Figure 2. Corporate tax revenues (% of GDP) in EU countries in 2004 and 2020. Source: own elaboration.

4.2. Regression Analysis

In the framework of the panel regression model, we examined the influence of seven determinants, which, according to economic theory and prior research, are believed to impact the level of corporate tax revenues. These determinants include the effective tax rate, GDP per capita, inflation, public debt, the difference between nominal tax rates on individual and corporate incomes, trade openness, and the corruption perception index. To ensure that our model effectively captures the studied issue, we verified several tested assumptions. The presence of heteroskedasticity was tested using the Breusch–Pagan test, which indicated that the assumption of constant variance and the absence of variable autocorrelation may not hold in the model. Using the Arellano method, we adjusted the model and obtained robust standard errors. An overview of the test results conducted in our modified model is presented in Table 3.

Table 3. The modified model, estimated using the fixed effects method following the Arellano adjustment. The level of statistical significance is indicated as follows with symbols * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$.

Determinants	β Coefficient	Robust Standard Deviation	Significance Level
ETR	0.062	0.020	0.002 **
GDPpc	−0.00002	0.000	0.036 *
HICP	0.047	0.024	0.048 *
PD	−0.019	0.005	<0.001 ***
ITR	0.024	0.011	0.031 *
ln(TO)	1.345	0.669	0.045 *
CI	−0.008	0.005	0.122

Source: own elaboration.

To determine whether the fixed effects model remains the most appropriate even after removing statistically insignificant variables, we used the same tests as in the original model:

OLS vs. RE

We used the Lagrange Multiplier test to decide between the OLS model and the RE model. We evaluated it based on the p -value, which is of less than 0.001 and, consequently, lower than the significance level of 0.05. This implies that we reject the null hypothesis (H_0) and consider the random effects model as more suitable.

OLS vs. FE

We used an F test for these two models to determine the better one. Once again, we compared the p -value (<0.001) with the significance level (0.05). Since the p -value is of less than α , we reject the null hypothesis (H_0) in favour of H_1 —fixed time effects are significant in panel data models. Therefore, the fixed effects (FE) model is more appropriate.

RE vs. FE

We used the Hausman test to choose between the random effects (RE) and fixed effects (FE) models, which had performed better in previous tests compared to the ordinary least squares (OLS) model. Since the p -value level is 0.027, which is less than $\alpha = 0.05$, we reject the null hypothesis in favour of the alternative. In conclusion, it is suggested that the most suitable model for determining the determinants of corporate tax revenues is the fixed effects model. The results of the final (adjusted) panel regression model testing are presented in Table 4, below.

Table 4. Results of the testing statistics.

Testing	Test	p -Value	Result
Stationarity	Augmented Dickey–Fuller test	0.121 (TO)	Only the TO variable is non-stationary
	Phillips–Perron Unit Root test	0.054 (TO)	
	Lagrange Multiplier test	<0.001	
Choice between models	F test	<0.001	The fixed effects model is the most appropriate
	Hausman test	0.027	
Heteroskedasticity	Breusch–Pagan test	<0.001	Present
Serial autocorrelation	Breusch–Godfrey/Wooldridge test	<0.001	Present
Cross-sectional dependence	Pesaran CD test	0.688	Absent

Source: Own elaboration.

5. Discussion

Evaluation of panel regression results

Based on the analysis and testing, our model has the following form:

$$\begin{aligned} CITREV_{it} = & 0.062 \times ETR_{it} - 0.00002 \times GDPpc_{it} + 0.047 \times HICP_{it} \\ & - 0.019 \times PD_{it} + 0.024 \times ITR_{it} + 1.345 \times \ln(TO_{it}) \\ & - 0.008 \times CI_{it} + \alpha_i + u_{it} \end{aligned} \quad (2)$$

After conducting statistical tests, we can consider the regression model to be statistically significant at a significance level of $\alpha = 0.05$ (the p -value of the model is lower than α). If the model was statistically insignificant, there would be doubts about the validity of the resulting coefficients. We assume that the individual relationships between corporate tax revenues and their determinants are not random but are valid based on the estimated coefficients. The coefficient of determination (R^2) represents the proportion of variance in the dependent variable that is explained by the independent variables in the regression model. In our model, this coefficient is at the level of 0.1349, indicating that the model can explain 13.49% of the total variability. This value is lower than our initial assumption. Based on previous empirical studies, we expected the model to include all significant factors influencing the level of corporate tax revenues.

The results below describe which variables analysed are statistically significant at the $\alpha = 0.05$ level of significance. The ETR variable is statistically significant at the $\alpha = 0.01$ level, and the PD variable is statistically significant at the $\alpha = 0.1$ level. The results of these variables could be interpreted as follows:

Effective tax rate: regression coefficient $\beta_1 = 0.062$. This represents the positive effect of ETR on corporate tax revenue. Specifically, if the effective tax rate was increased by 1%, this would induce an increase in corporate tax revenue of 0.062% of GDP.

GDP per capita: In contrast, the GDP per capita has a slight negative impact on corporate tax revenues. If GDP per capita was to increase by EUR 1 per capita, corporate tax revenues should fall by 0.00002% of GDP.

Inflation: We can evaluate that the correlation between HICP and corporate tax revenues is positive. The regression coefficient is 0.047. This means that a 1% increase in HICP is related to a 0.047% increase in corporate tax revenue.

Public debt: As we expected, public debt is another variable that has a negative impact on corporate tax revenues. Specifically, a 1% increase in public debt leads to a 0.019% decline in corporate tax revenues.

Difference between individual tax rate and corporate tax rate: The regression coefficient β_5 is associated with the variable expressing the difference between the nominal income tax rates for individuals and legal entities (corporations). Therefore, from a certain perspective, we observe the impact of the income tax rate on individuals. The effect induced by this difference in tax rates is positive. An increase in corporate tax revenues of 0.024% of GDP is associated with a 1% increase in individual tax rate variables.

Trade openness: Due to the non-stationarity of the data, we had to transform the trade openness indicator using the natural logarithm. Consequently, the interpretation of this variable will be different from that of the others. Specifically, we will not interpret the regression coefficient in the original units of corporate tax revenues and trade openness (% of GDP), but as percentage changes. Therefore, a 1% increase in trade openness is associated with a 1.345% increase in corporate tax revenues. In the case of reversing the logarithm values using the natural logarithm base exponentiation for the value β_6 ($e^{1.345}$), the interpretation would be as follows: a 1% increase in trade openness is associated with a 3.896% increase in corporate tax revenues as a percentage of GDP.

To better illustrate the impact of individual variables on corporate taxation, we will compare the values of the obtained regression coefficients with the average values of corporate tax revenues. The average value for all observed countries over the entire time horizon is 3.03% of GDP. This means that in the case of the variable with the highest regression coefficient (ETR), the average value of corporate tax revenues would increase to 3.09% of GDP when ETR increases by 1%. Conversely, at first glance, GDP per capita has

the smallest impact. However, this is also because it represents a change when increasing by EUR 1 per capita. For example, if we were to calculate it based on the average year-on-year change across all observed countries over the entire time horizon (EUR 240 per capita), the impact would not be as low. In fact, if GDP per capita was to increase by EUR 240 per capita, corporate tax revenues would decrease by 0.005% of GDP. Since a significant impact on corporate tax revenues was only observed for six variables, namely ETR, GDP, HICP, PD, ITR, and TO, we will not evaluate all regression coefficients. However, it is important to note that even though, in our model, the remaining variables (i.e., nominal tax rate, foreign direct investment, unemployment, corruption perception index, industry turnover index, and value-added) did not exhibit any significant influence, when compared to the findings of other authors, their positive or negative effects have been demonstrated.

The evaluation of the results obtained from the analyses is defined through responses to a pre-established research question described in the *null hypothesis*. From that perspective, the null hypothesis is rejected.

The results of the conducted analysis, along with our expectations and the findings of other empirical studies, are presented in Table 5. One significant difference between our research and that of other authors is the fact that the statistically significant impact of certain determinants on corporate tax revenues was not confirmed in our case. These variables include the nominal tax rate, foreign direct investment, unemployment, corruption perception index, industry turnover index, and value-added. We can conclude that the specified research question was not confirmed, not only in terms of the statutory tax rate being a decisive variable significantly affecting corporate tax revenues but also because it was statistically insignificant and, therefore, had to be removed from the model. Among the remaining six determinants, a statistically significant impact was observed. However, the results were not consistent with expectations or the findings of other authors in some cases. In the case of the impact of the effective tax rate, a positive effect on corporate tax revenues was confirmed. Apart from this variable, the results of all authors aligned with our expected and confirmed outcomes concerning the indicator representing the difference between the income tax rate for individuals and the income tax rate for legal entities. For this determinant as well, a positive effect was observed. Furthermore, a positive relationship was confirmed between corporate tax revenues and both inflation and trade openness. While the opinions of various authors differed regarding both variables, our results align with the findings of Tahlova and Banociova (2019). In our research, both GDP per capita and public debt had a negative effect on corporate tax revenues (CITREV). Regarding the variable PD, we arrived at the same results as authors Konečná and Andrejovská (2020). The most surprising finding is the negative effect of GDP per capita, as it does not align with the opinions of other authors, including our own expectations.

Table 5. Evaluation of our results and results from other empirical research.

Determinant	Authors	Correlation between the Determinant and Corporate Tax Revenues			Interpretation
		According to the Author	Our Own Expected	Our Own Identified	
TR	Konečná and Andrejovská (2020)	+			The determinant does not have a statistically significant impact on corporate tax revenues.
	Tahlova and Banociova (2019)	+			
	Clausing (2007)	+			
	Karpowicz and Majewska (2018)	+			
ETR	Andrejovská (2019)	+			An increase in the effective tax rate leads to an increase in corporate tax revenues.
	Cozmei (2015)	+	+	+	
GDPpc	Clausing (2007)	+			An increase in GDP per capita leads to a decrease in corporate tax revenues.
	Konečná and Andrejovská (2020)	+	+	–	
	Cozmei (2015)	+			

Table 5. Cont.

Determinant	Authors	Correlation between the Determinant and Corporate Tax Revenues			Interpretation
		According to the Author	Our Own Expected	Our Own Identified	
HICP	Cung and Son (2020)	–	+	+	An increase in inflation leads to an increase in corporate tax revenues.
	Tahlova and Banociova (2019)	+			
FDI	Clausing (2007)	+	+	X	The determinant does not have a statistically significant impact on corporate tax revenues.
	Cozmei (2015)	+			
U	Tahlova and Banociova (2019)	–	–	X	The determinant does not have a statistically significant impact on corporate tax revenues.
	Andrejovská (2019)	–			
	Kennedy et al. (2015)	–			
PD	Konečná and Andrejovská (2020)	–	–	–	An increase in public debt leads to a decrease in corporate tax revenues.
	Krogstrup (2002)	+			
ITR	Cozmei (2015)	+	+	+	A higher income tax rate for individuals leads to an increase in corporate tax revenues.
	Tahlova and Banociova (2019)	+			
TO	Cozmei (2015)	–	+	+	An increase in trade openness leads to an increase in corporate tax revenues.
	Tahlova and Banociova (2019)	+			
CI	Tanzi and Davoodi (2012)	+	+	X	The determinant does not have a statistically significant impact on corporate tax revenues.
	Cung and Son (2020)	+			
	Mihokova et al. (2016)	+			
ITI	Clausing (2007)	+	+	X	The determinant does not have a statistically significant impact on corporate tax revenues.
	Cozmei (2015)	+			
VA	Tahlova and Banociova (2019)	+	+	X	The determinant does not have a statistically significant impact on corporate tax revenues.
	Clausing (2007)	+			

Source: own elaboration.

6. Conclusions

To analyse the determinants of corporate tax revenues, we applied panel regression, where we constructed a pooled regression model, fixed effects (FE) model, and random-effects (RE) model. Based on our testing, we subsequently concluded that the most suitable model was the fixed effects model after the Arellano adjustment. The Arellano adjustment was necessary due to the presence of heteroskedasticity and serial correlation. Out of the initial twelve determinants, the statistically significant impact on corporate tax revenues was not confirmed for six, despite being confirmed in empirical studies by other authors. These variables included the nominal tax rate, foreign direct investments, unemployment, corruption perception index, industrial turnover index, and value-added. After adjusting the model by excluding statistically insignificant variables, we arrived at the final form of the fixed effects model following the Arellano adjustment. Based on this model, we can interpret that a significant impact was confirmed for the remaining determinants, with a positive effect on corporate tax revenues observed for the following variables: effective tax rate, the difference between individual tax rate and corporate tax rate, inflation, and trade openness. An increase in their values leads to increased corporate tax revenues for these variables. In contrast, the indicators of GDP per capita and public debt had a negative impact. Therefore, an increase in these variables would lead to a decrease in corporate tax revenues.

Interestingly, the analysis results reject this hypothesis, although the model showed it to be positive but statistically insignificant. On the other hand, an interesting research result is that the analysis confirmed the effective tax rate as a significant determinant of tax revenues. From this, we can conclude that policies should be aimed at an effective tax rate or a better harmonisation of the nominal tax rate towards the effective rate.

Future studies need to run some scenarios where corporate taxes are raised when economies become less liberal and stringent. Then, such a scenario should be compared with a case where the global markets become more flexible. Such an analysis will help determine the net impact a corporation tax can make in these economies. That will answer

the question of what aspects of changes in the design of corporate tax are possible to arrive at those ideal scenarios.

The current study has certain limitations, and future research should aim to address them. For instance, the study only considered a limited set of macroeconomic determinants of corporate tax revenues. Also, microeconomic determinants still need to be included. Therefore, it could be beneficial for future studies to include additional determinants, such as total firm assets, ROA, sector size, sector profitability, or sector value added, to gain a more comprehensive understanding of the issue.

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