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ESTIMATING TAX REVENUES ON ECONOMIC GROWTH FOR SOUTHEAST EUROPEAN COUNTRIES

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Abstract: *The study aims to identify and empirically analyze the impact of direct tax and indirect tax revenues on economic growth in the transition countries of Southeast Europe, based on panel data for the period 2005-2019. Factors that are included in the study as independent variables are direct tax and indirect tax revenues. In contrast, the dependent variable is defined as the annual GDP growth in percentage, an indicator of economic growth. The econometric approach is OLS regression analysis, random effects regression, and fixed effects regression. The model's reliability has been tested by applying diagnostic tests, such as autocorrelation, normal distribution, and heteroscedasticity. Moreover, the result of the Breusch and Pagan Lagrangian multiplier and Hausman test suggests that the adequate model is a regression with fixed effects. Therefore, the findings with a regression with fixed effects confirm that the revenues from indirect taxes resulted in a positive and statistically significant effect. In contrast, direct tax revenues did not significantly affect economic growth but resulted in a positive sign. The analysis through the econometric model enabled the achievement of the aims set in this paper and the achievement of the final goal, providing observed evidence that the role of tax policy is crucial to encouraging economic growth.*

Keywords: *Economic Growth; Direct Taxes; Indirect Taxes; Panel Data*

INTRODUCTION

Southeast Europe's (SEE[1]) transition economies have essential economic challenges to enhance economic growth and progress across the fiscal policy. As a result of the economic and political transformation, all SEE transition countries were forced to restructure their economies. At the beginning of the transitional phase, these economies adopted various reforms essential for transforming from a planned economy to a free-market economy. Within these reforms, a key place belongs to fiscal policy reforms, including tax modifications aimed at improving the contribution to tax returns and total government returns. Based on the World Bank's regular economic reports for Southeast Europe, using income or expenses as a measure, the government's share of the economy varies greatly in SEE.

Most of the total revenue comes from taxes. Most tax incomes in SEE states are generated by indirect taxation, whereas direct taxes are relatively small, reflecting high unemployment and informality.

Taxation is vital for economic growth and provides governments with the revenue they require to support economic progress. In any state, industrialized or not, resource mobilization is essential to generating a faster economic growth rate. Furthermore, tax revenues play a crucial role in

[1]Southeast European countries: Albania, Bosnia and Herzegovina, Kosovo, North Macedonia, Montenegro and Serbia.

growing countries through resource mobilization (Canicio and Zachariah 2014). Therefore, in this context, the study will strive to explain the impact of direct tax revenues as well as indirect taxes (direct taxes are considered personal income taxes, corporate taxes, rent taxes, and interest taxes, while indirect taxes are added value, excise taxes, etc.) on economic growth, using secondary data for the six transition countries in SEE.

Table 1: Direct and Indirect Revenues in Transition Countries of SEE (Source: Ministry of Finance of Albania, Kosovo, Bosnia and Herzegovina, North Macedonia, Montenegro, and Serbia 2019)

	Albania		Bosnia and Herzegovina		Kosovo		North Macedonia		Montenegro		Serbia	
	Direct Taxes	*Indirect Taxes*	*Direct Taxes*	*Indirect Taxes*	*Direct Taxes*	*Indirect Taxes*	*Direct Taxes*	*Indirect Taxes*	*Direct Taxes*	*Indirect Taxes*	*Direct Taxes*	*Indirect Taxes*
2005	3.3	12.0	3.5	20.1	3.4	16.0	3.5	14.2	6.1	16.7	5.7	17.7
2006	3.6	12.7	3.4	22.5	3.9	16.4	3.9	13.3	4.3	16.1	6.2	16.4
2007	3.7	13.1	3.3	21.5	5.2	15.3	4.0	14.0	5.4	18.2	5.8	16.7
2008	4.0	13.7	3.8	19.7	4.1	16.3	4.2	13.6	6.0	18.2	6.0	16.4
2009	3.8	13.2	3.5	18.3	3.1	16.2	3.2	13.3	5.2	16.7	5.4	15.7
2010	3.6	12.9	3.6	19.3	3.0	17.6	2.8	13.1	3.7	15.9	5.3	15.9
2011	3.7	12.8	3.1	19.4	2.9	19.3	2.8	13.2	3.6	16.4	5.2	15.3
2012	3.4	11.9	3.1	19.4	3.0	18.6	2.8	12.6	4.7	15.9	5.7	15.3
2013	3.3	11.5	3.1	18.5	3.3	18.5	2.9	11.9	4.0	17.6	5.3	15.0
2014	3.6	11.6	3.0	18.7	3.4	18.1	3.2	12.4	4.3	18.9	5.2	15.7
2015	3.8	11.9	3.5	18.5	3.4	19.1	4.4	11.8	4.1	17.2	4.9	15.9
2016	4.1	12.1	3.7	18.4	3.9	20.2	4.3	12.2	4.2	17.3	5.2	16.7
2017	4.1	12.3	4.0	18.2	3.7	20.5	4.3	12.2	3.7	18.0	5.8	16.8
2018	4.3	12.0	4.2	18.7	4.0	19.9	4.9	12.1	5.4	17.9	5.7	16.5
2019	4.9	11.0	3.9	19.4	4.0	19.8	4.4	12.2	5.6	18.9	6.1	16.8

Study as an essential and attractive field for various researchers aims through research questions to argue and give the answer to the following research questions:

R_{Q1}: How do direct tax revenues affect economic growth?

R_{Q2}: How do indirect tax revenues affect economic growth?

Undoubtedly, these research questions provide a solid basis for answering these questions, creating a consistent correlation with the hypothesis as follows:

H_1: There is a positive relationship between direct tax revenues and real GDP growth.

H_2: There is a positive relationship between indirect tax revenues and real GDP growth.

This research aims to statistically study the impact of direct and indirect taxes on economic growth in Southeast European economies. The study uses secondary data from the Ministry of Finance publications from the countries involved in the analysis and spans 2005 to 2019. This study will contribute to the literature by providing empirical evidence on tax returns' influence on economic growth and the scientific and practical importance of upgrading tax policy and its effect on economic growth. Studying tax policy and economic growth is expected to help policymakers create growth-oriented programs and make fiscal changes.

LITERATURE REVIEW

Regarding evaluating the impact of taxation policy on economic growth, the neoclassical viewpoint contends that taxation policy has no long-run influence on economic growth. The Solow model represents an exogenous theory; its creator is Robert Solow (1956). Conferring to this philosophy, the government's fiscal policy will not affect the economy's long-term; even so, a slight variation in economic growth will be caused by key production issues such as workforce, capital, and technological progress, which are defined outside of the (Solow 1956). However, under the neoclassical paradigm, taxes imposed by the government might impact development during the transition to a new stable state if they change the rate of savings and, as a result, the level of investment (Maganya 2020). Other economists expanded the idea further, such as Domar (1957), who developed the Harrod-Domar model, which adds the rate of savings in an economy as one of the long-run factors of the growth rate (Etim et al. 2021).

Endogenous growth theorists, on the other hand, think that economic development is strongminded inside the system and that taxation policy has a consequence on economic growth over time (Scarlett 2011). Romer's (1986) idea of endogenous growth stresses issues such as "spillover and learning by doing", in which firm-specific decisions to invest in capital and R&D, or individual investment in human capital, may have constructive external consequences that benefit the rest of the economy.

According to this paradigm, growth policies supported by government spending and tax returns may provide steady and continual long-term growth (Canicio and Zachary 2014).

Although most theories on the interaction between taxes and economic development boost the notion that tax increases distress economic growth, observed research suggests that tax increases have varying effects on economic growth. Nguyen (2019) observes the influence of direct (DT) and indirect taxes (IT) on economic development in Vietnam from 2003 to 2017, using the ordinary least-squares regression approach. The findings of arithmetic tests suggest that taxes have a beneficial effect on Vietnam's economic growth. Therefore, the outcomes of DT and IT are distinct. Indirect taxes - (IT) seem to have a beneficial influence and contribute to Vietnam's economic development, but DT has an ambiguous effect. Hakim (2020) analyzed the influence and implications of DT and IT on economic growth and total tax returns in a panel of 51 nations from 1992 to 2016. Direct taxes - (DT) were shown to be substantial and adversely connected with economic growth, whereas IT had a positive but insignificant influence on the dependent variable.

Ilaboya and Mgbame (2012) explored the association between IT and economic growth. The study discovered a negative and insignificant association between IT and economic development in Nigeria. Ahmad et al. (2010) studied the empirical connections between IT and economic growth in Pakistan beginning in 1974. The verdicts revealed that IT has an adverse and significant influence on economic growth in the long term, but its coefficients are insignificant in the short run. Although Geetanjali and Venugopal (2017) evaluated the influence of DT contributions on GDP from 2000 to 2016, it was discovered that DT significantly affected GDP growth.

Palaniappan and Arunima (2021) investigated the influence of DT and IT collections on Puducherry economic growth in India from 2007 to 2019, utilizing DT and IT as independent variables and GDP and per capita income as dependent variables to measure economic growth. According to the study, IT revenues have a substantial positive effect on economic growth, whereas DT revenues

have a significant negative effect. Stailova and Patonov (2013) outlined empirical research to examine the effect of taxes on economic growth using EU-27 statistical data from 1995 to 2010. The results showed that DT significantly impacts economic growth since they are more cost-effective for EU Member States. Due to various inequalities in the structure of IT, indirect taxes have a predisposition to reduce budget revenues. Petru-Ovidiu (2015) used an empirical model to examine the effect of tax structure on the evolution of economic growth in six Eastern European countries from 1995 to 2012. The study was based on a series of similar groups that looked at the influence of various revenue sources from DT and IT on economic growth. Thus, according to empirical findings, DT is adversely associated with economic growth, but IT positively affects the dependent variable represented by economic growth.

Golemi and Muço (2020) investigated the effect of fiscal policy on economic growth in Western Balkan countries from 2005 to 2018. According to empirical findings, fiscal revenues positively affect the economic growth of the economies under consideration.

Bazgan (2018) researched indirect taxes' influence on economic growth using statistics from Romania from 2009 to 2017. According to the econometric model, a positive adjustment in the IT structure will significantly affect economic growth over the medium term. On the other hand, economic growth will have a negative effect in the next period after implementing a favorable modification in the structure of DT, then revert to a positive effect over the medium term and sustain that benefit in future periods. Korkmaz et al. (2019) investigated the influence of direct and indirect taxes on Turkey's economic progress. Analytical data revealed that indirect taxes have a positive and substantial effect on economic growth, whereas direct taxes have a negative and significant impact. Korbi and Zani (2021) investigated the effects of direct and indirect taxes on Albania's economic growth. According to the estimates, revenues from direct taxes had the most considerable effect, whereas indirect taxes had no significant effects on the economy from 1993 to 2020. Furthermore, using a monthly time series from 2006 to 2016, Rexha et al. (2021) assessed the effects of direct and indirect taxes on Kosovo's economic progress over ten years. The empirical results revealed that indirect taxes significantly positively affected real GDP in Kosovo.

RESEARCH METHODOLOGY AND DATA ANALYSIS

Data

The research is grounded on the investigation of panel data for 2005-2019, in a total of 90 observations. To apply the econometric model, annual data for three endogenous factors were used, respectively, as dependent variables for the increase of Gross Domestic Product (GDP), the economic growth indicator measured by the percentage increase in GDP. In contrast, the level of direct taxes as a percentage of Gross Domestic Product (% of GDP) and indirect taxes as a percentage of Gross Domestic Product (% of GDP) were used as explanatory variables. Statistical data are provided annually for countries in transition in Southeast Europe (SEE). The World Bank, the Ministry of Finance in each respective country, and the Tax Administration of Kosovo provide them. The definitions and descriptions of the selected variables are listed in the table below.

Table 2: Data Definition and Description (Source: Authors' specification)

Abbreviations	Defining Variables	Indicators Expressed in%
GDP_{growth}	Gross domestic product growth	Annual GDP growth rate (%)
DT_GDP_{rate}	Direct taxes to GDP	Annual DT to GDP rate (%)
IT_GDP_{rate}	Indirect taxes to GDP	Annual IT to GDP rate (%)

It is worth mentioning that the data applied in the investigation are processed according to the format defined by the International Monetary Fund and the World Bank. Therefore, many different authors have used data from the same sources and, as such, are considered reliable sources for scientific study.

Specification of the Model

To elucidate the influence of explanatory variables on the predicted variable in this study, three patterns were used: ordinary least squares (OLS), random effects (RE), and fixed effects (FE). OLS is a statistical technique of investigation that evaluates the association between one or more independent variables and a dependent variable. The multiple regression method analyzes the association between the explanatory and dependent variables. The OLS model checks if such a link exists, and if it does, it intends to use existing information for the explanatory variables to improve the accuracy in predicting the value of the dependent variable. The study used the OLS because it is considered the most applied method due to its simple application and has been used by various experts (Ukpabi 2019; Ezejiofor et al. 2021; Garga 2022).

OLS is defined as follows:

$$Y_{i,t} = \alpha_i + \beta_1 X1_{i,t} + \beta_2 X2_{i,t} + \beta_3 X3_{i,t} + \cdots + \beta_k Xk_{i,t} + \varepsilon_{i,t} \quad (1)$$

Based on the factors stated above, the equation is as follows:

$$GDP_growth_{i,t} = \alpha_1 + \beta_1 DT_GDP_rate_{i,t} + \beta_2 IT_GDP_rate_{i,t} + \varepsilon_{i,t} \quad (2)$$

$GDP_growth_{i,t}$: represents Gross domestic product growth, where i = country and t = 2005-2019
$X_{i,t}$: is a vector of explanatory variables (direct taxes and indirect taxes)
β_s: are the coefficients of the explanatory variables
$\varepsilon_{i,t}$: are the variable for estimating residual error in period t

The values of the explanatory categorical variables in a random effects model represent a random sample from many value populations.

The random effects model has the form of the equation as follows:

$$GDP_growth_{i,t} = \alpha_1 + \beta_1 DT_GDP_rate_{i,t} + \beta_2 IT_GDP_rate_{i,t} + \upsilon_{i,t} + \varepsilon_{i,t} \quad (3)$$

The fixed effects model is commonly employed when examining neglected variables that remain constant over time and vary across units. These variables, known as unobserved heterogeneity or fixed effects, are the focus of investigation (Xu et al. 2007).

The equation for the fixed effects model is specified as follows:

$$GDP_growth_{i,t} = \alpha_1 + \beta_1 DT_GDP_rate_{i,t} + \beta_2 IT_GDP_rate_{i,t} + \varepsilon_{i,t} \quad (4)$$

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To determine the adequacy of the applied model, the Breusch-Pagan Lagrangian multiplier test for the random model was employed. Based on these results, it is seen that Chi-bar2 (01) is with probability ρ = 1.000, which proves that the random model is not significant, the basic hypothesis is not confirmed, and the alternative hypothesis is applied by concluding that the adequate model is a fixed effect. To further reinforce the robustness of the suggested econometric model, the Hausman test was also applied to determine whether the fixed effects model or the random effects model is suitable for panel data analysis and to test the baseline hypothesis if the differences in the coefficients are non-systematic. Hausman (1978) suggests that the null hypothesis for the test is an appropriate model of the random effects model, implying that there is no connection between the cross-section and the explanatory variables. The alternative hypothesis shows that the proper model is the fixed effects model. Furthermore, based on the Prob> chi2> 0.05 results, we argue that the selection is adequate, and the appropriate model is a fixed effect.

Diagnostic assessments, such as autocorrelation, normal distribution, and heteroscedasticity, have also been performed to ensure efficient, reliable, and accurate prediction of the model to be evaluated. The Wooldridge test was applied to test whether the panel data applied in the analysis of SEE countries has autocorrelation. The results generated in the first adjustment on autocorrelation show that F (1.5) = 0.570 with a probability of ρ = 0.4842, proving that the data have no problem with autocorrelation Wooldridge (2002). On the other hand, the Skewness/Kurtosis test was applied to test the data distribution—the use of Skewness and Kurtosis to describe distributions dates back to Pearson (1895).

The results of this test argue that the applied data have a normal distribution, based on the probability of Skewness being 0.0095, while the probability of Kurtosis is 0.0765, with a common probability of 0.0132. Finally, the Modified Wald test by Greene (2000) is applied if the applied data have problems with heteroscedasticity. The results of this test are chi2 (6) = 95.00 with probability Prob> chi2 = 0.120. This result proves that the data have no problem with heteroscedasticity in the data panel in the fixed effect regression.

EMPIRICAL DISCOVERIES AND DISCUSSIONS

This section presents and discusses the outcomes of descriptive statistics, correlation analysis, and regression results.

Descriptive Statistics

The statistics for the data exploited in this study are given in Table 2 as follows: the number of observations, the mean, the standard deviation, and the smallest and largest values.

Table 3: Summary of Statistics (Source: Authors' calculations)

	Obs	Mean	St. Deviation	Min	Max
GDP_{growth}	90	3.293333	2.502574	-5.7	8.8
DT_GDP_{rate}	90	4.151111	0.937034	2.8	6.2
IT_GDP_{rate}	90	16.02111	2.848043	11	22.5

The table above illustrates that the average GDP growth rate in SEE was approximately 3.3 percent, with the lowest decrease rate of -5.7 percent, a maximum growth rate of 8.8 percent, and a standard deviation of 2.5 percent. Direct tax revenue has an average value of 4.1 percent, with a low standard deviation of 0.9 percent, a minimum value of 2.8 percent, and a maximum value of 6.2 percent. This means that direct tax revenues in SEE countries make an average of 4.1 percent of GDP. Unlike direct taxes, the average value for indirect taxes is higher by 16.0 percent, with a standard deviation of 2.8 percent, minimum values of 11, and a maximum of 22.5 percent.

Correlation Analysis

From the correlation background in Table 3, the connection between economic growth and explanatory variables is examined. Correlation analysis aims to reveal the significant association between explanatory variables and dependent variables.

Table 4: Correlation Analysis (Source: Authors' calculations)

Correlation			
	GDP_{growth}	DT_GDP_{rate}	IT_GDP_{rate}
GDP_{growth}	1.0000		
DT_GDP_{rate}	0.0708	1.0000	
IT_GDP_{rate}	0.0906	0.0245	1.0000

Referring to Table 3, the correlation matrix shows that indirect tax revenues and GDP growth have the strongest correlation (.090), confirming a positive link between indirect tax revenues and GDP growth rates. The correlation matrix also suggested a positive correlation (.070) between direct tax revenues and GDP growth. These positive relations of explanatory variables in the dependent variable mean that the higher these correlations are, the more the increase in GDP growth in the economies of SEE countries will be affected. These results also give us solid indications and, at the same time, confirm the test findings for autocorrelation, as no coefficient exceeds the value greater than $\alpha > 5$.

Regression Outcomes

As seen in Table 4, the empirical results achieved by the OLS and RE models are the same. Based on the results elaborated above on determining the adequate model in our case, Hausman test FE and RE chi2 (17) = 11.96 and with probability Prob> chi2 = 0.4026 suggests that from the applied models, we select the fixed effects model as an adequate model.

Table 5: Estimation Results (Source: Authors' calculations)

	OLS		RE		FE	
Variable	Coefficient	P-Value	Coefficient	P-Value	Coefficient	P-Value
Constant	-4.451546	0,698	-4.451546	0,698	151.5689	0,056
DT_GDP_{rate}	-.2039729	0,728	-.2039726	0,728	.3439275	0,652
IT_GDP_{rate}	.4315272	0,145	.4315272	0,145	1.50189	0,009
Diagnostic tests						
Observation	90	90	90	90	90	90
F-test	F(17,70)=5.48	P=0.0000	F(17,70)=5.48	P=0.0000	F(17,65)=6.32	P=0.0000
R-squared		0.5708		0.5708		
Adj-R-squared		0.4666		0.4666		
within						0.6232
between						0.5608
overall						0.0713
No. of groups	6		6		6	
Model	OLS		RE		FE	

The fixed effects model data findings show that R-squared within has a coefficient of 0.6232, proving that the data applied to the model have a variation of 63.32 percent. At the same time, R-squared has a coefficient of 0.5608, which shows us that the explanatory variables explain the 56.08 percent increase in gross domestic product defined as dependent variables. The other critical proof is the F-test for the group, which in our case is F = 6.32, which means that all variables have a value lower than F <10, and the model is adequately defined.

Results achieved in the fixed effects model for the variable indirect taxes (IT) presented in the table above resulted in a positive effect and a very high significance level of 99.99% (p = 0.009). This shows that the increase of 1 percent of the revenues from indirect taxes increases the gross domestic product by 1.5 percent. These empirical discoveries confirm the second hypothesis that there is a positive relationship between indirect tax revenues and real GDP growth. These results are also consistent with the conclusions of the authors Matallah and Matallah (2017), who analyzed the impact of fiscal policy on economic growth in Algeria throughout the period 1970 to 2015, using the Johansen co-integration test and the vector error correction model (VECM).

Empirical results showed that indirect taxes have a positive long-term impact on real GDP. Vrablíkova (2016) investigated the impact of indirect taxes on economic growth in the long run, using data from selected European countries from 1970 to 2011. The outcomes of the empirical breakdown showed that economic growth has been positively affected by indirect taxes. Rexha et al. (2021) addressed the effects of direct and indirect taxes on Kosovo's economic growth, and the results suggested that indirect taxes have a positive and significant impact on Kosovo's real GDP.

Direct taxes (DT), according to empirical findings, showed that they have a positive correlation with economic growth, but it is not statistically significant since the p-value is worth (p = 0.652), which means that it has a value greater than 0.10; therefore these results do not confirm the first hypothesis that there is a positive and statistically significant relationship between direct tax revenues and real GDP growth. This is also revealed by the results of Ogundana et al. (2017), which

examined the impact of direct and indirect taxes on economic growth for the period 1994-2013 and concluded that direct taxes have a positive and statistically insignificant relationship with economic growth in Nigeria. In their study, Ziberi and Hodaj (2020) analyzed the impact of direct and indirect taxes on economic growth, especially in the case of Kosovo. Their results showed that direct taxes have a positive but insignificant correlation with GDP growth.

CONCLUSION

This study researches the theoretical and empirical literature by empirically analyzing the impact of direct tax - (DT) revenues and indirect tax - (IT) revenues on economic growth in the transition economies of Southeast Europe. The smallest squares model, the random effects model, and the fixed effects model were used to apply econometric analysis. Based on the results of the Breusch-Pagan Lagrangian and Hausman tests, it has been determined that the fixed effects model is more appropriate. The panel data, consisting of 90 observations from 2005-2019, were analyzed using the STATA statistical program to examine the relationships between the dependent and independent variables. The level of reliability of hypothesis testing is with the significance of 1%, 5%, and 10%, respectively.

Empirical findings revealed a long-term association between indirect tax revenue and economic growth. Indirect tax revenues showed a positive and statistically significant effect on economic growth at a very high significance level of 99.99% ($p = 0.009$). This shows that the increase of 1 percent of the revenues from indirect taxes increases the gross domestic product by 1.5 percent. On the other hand, direct tax revenues did not significantly affect economic growth but resulted in a positive sign. These results have been analyzed in the context of SEE for the period under investigation and provide solid and consistent indications to reach conclusions. However, it is worth noting that the research also has some limitations as the observed period is short and only has 90 observations. However, these limitations cannot affect the results found, and we believe that they create a solid basis for young researchers, the academic level, and, in particular, for policy-making structures. As there are different views on whether tax policy has been effective in promoting economic growth, this study presents new evidence of the effects of tax policy on economic growth in the transition countries of Southeast Europe during the review period.

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CRediT AUTHOR STATEMENT

Esat Durguti: Conceptualization, methodology, software, supervision, validation.
Luljeta Gllogjani: Conceptualization, methodology, software, data curation, writing - original draft preparation, visualization, investigation, writing - reviewing and editing.

All authors have read and agreed to the published version of the article.

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