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The Relation Between Government Expenditures and Economic Growth: An Empirical Analysis in European Developing Countries

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Abstract

The relationship between government expenditures and economic growth has become a significant consideration by many researchers in recent years, especially after the financial crisis of 2008-2009 and the spread of the COVID-19 pandemic. Therefore, earlier studies show different results regarding the impact of government expenditures on economic growth. The primary purpose of this study is to examine the impact of government expenditures on economic growth. Specifically, it aims to elucidate how a potential increase in government expenditure may influence overall economic growth. The study aims to deal with government expenditures over a long period, which includes data from 1995 to 2022. Econometric models are applied to test the impact of government expenditures on economic growth in developing European countries. To confirm the hypotheses, a comprehensive methodology based on several methods such as OLS, Fixed and Random Effects, Hausman Test, FMOLS, DOLS and GMM are applied. The results show a negative relationship between general government expenditures and economic growth, where the increase in government expenditures would have a negative effect on economic growth by -0.16% in developing European countries. Moreover, this study contributes to the governments of the respective countries by empirically investigating the correlation between government expenditures and economic growth.

Keywords: Government Expenditures, Covid-19, Economic Growth, Panel Data, Developing European Countries.

JEL: E60, E69, E011, H63

1. Introduction

Government expenditures and their impact on the economy have been a much-discussed segment in recent years. The size and impact of government expenditures

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on economic growth depend on the countries and economic policies they build. Many studies have addressed the impact of government expenditures on economic growth (Loizides & Vamvoukas, 2005; Cooray, 2009; Ono, 2014; Kuehnel & Irmen, 2009; Kolluri, Panik & Wahab, 2010). However, it has been shown that not many studies analyzed the impact of government expenditures on economic growth focused on developing European countries (Lupu et al., 2018; Fetai et al., 2017; Alexiou, 2009; Dudzevičiūtė et al., 2018; Qehaja et al., 2022). The economic theory, specifically the "classical" theory, defines that the increase in government expenditures represents a heavy burden for the economy and future generations. On the other hand, according to the "Keynesian" theory, government expenses and public debt are the only instruments for controlling the expenses of a country. These approaches supported the achievement of the goal of full and stable employment, where taxes and expenditures were to be increased or decreased as needed. Therefore, the main goal of this scientific study is to analyze the relationship between government expenditures and economic growth in developing European countries.

In recent years, there has been a noticeable shift in government expenditure away from its conventional emphasis on funding capital projects which are crucial for driving the multiplication of gross domestic product and promoting economic growth. The focus has transitioned towards increased spending in the health and public health sectors, offering financial guarantees for private sector loans, providing financial aid to businesses grappling with economic difficulties, and directly supporting citizens impacted by the stagnation of economic progress. This reallocation of funds prompts an examination of its potential effects on broader economic advancement.

Nowadays, the global economy has faced a severe financial crisis, first due to the 2008-2009 financial crisis, then the rapid spread of the COVID-19 pandemic, and finally, the conflict between Russia and Ukraine. Betrancea et al. in their studies addressed these financial crises in relation to economic growth (Batrancea et al., 2009; Batrancea, 2021). As a response to these situations, countries increased government expenditures to support their economy trying to reduce the negative impact of these situations. In line with the developed countries, developing European countries have increased government expenditures, primarily oriented towards social schemes, supporting specific sectors through relief measures to overcome the crisis caused by the COVID-19 pandemic and the high level of inflation. Serowaniecs's (2023) study analyzed the role of the traditional budget within Poland's public finances. The findings indicated an increase in public debt that exceeds the state threshold related to GDP, incurred to cover expenditures stemming from the COVID-19 pandemic, as well as the social and economic fallout of the conflict between Russia and Ukraine. Especially the beginning of 2022 was manifested with a high increase in the inflation rate, which has directly affected the increase in import prices because a large part of the developing European countries moved towards the importing economy.

However, the increase in the inflation rate has not been manifested as a consequence of economic development but has flowed due to imported products and services. Considering the fact that Russia and Ukraine own a large part of the market for certain products such as oil, cereals, wheat, oil derivatives, and natural gas, the source of the increase in

inflation has been the cost of imported goods and products. In principle, the increase in government expenditures could positively affect economic growth. Therefore, it is essential to deal empirically with the increase in government expenditures and their impact on the economies of developing European countries.

The novelty of this paper compared to previous studies (Alexiou, 2009; Lupu et al., 2018; Shih-Ying et al., 2010; Nurudeen & Usman, 2010; Dudzevičiūtė et al., 2018; Odhiambo, 2015; Qehaja et al., 2022; Nyasha & Odhiambo, 2019) is found in utilizing the dynamic panel model (GMM) to explore the relationship between government expenditure and economic growth, and with additional independent variables, in developing European countries. The dynamic GMM model is applied not only to investigate these relationships but also to adjust for the endogeneity bias that stems from the mutual influence of GDP per capita on government spending, GDP, and other explanatory variables. Furthermore, this study is unique in its comprehensive inclusion of all developing European countries in its empirical analysis, covering an extensive period of over 25 years from 1995 to 2022 and an in-depth analysis of the previous studies related to the impact of government expenditures on economic growth in developing countries. To test and support the hypotheses of this study, several econometric models based on "Panel Data" data are used. Data from the World Bank, the European Central Bank, and the central banks of the European developing countries supported the application of different econometric models to test and validate the hypotheses of the study.

Based on the research methods and models used in this study, a non-linear relationship between government expenditures and economic growth is identified. More specifically, the unbalanced growth of government expenditures during periods of high inflation and economic instability may lead to a negative effect on economic growth in developing European countries. However, government expenditures oriented toward education are likely to affect these countries' economic growth positively.

2. Literature Review

Many authors have addressed the impact of government expenditures on economic growth in developed countries as well as in developing countries (Bojnec & Ferto, 2012; Barro & Sala-I-Martin, 1992; Grier & Tullock, 1989; Blanchard & Perotti, 1999; Arpaia & Turrini, 2008; Avdimetaj et al., 2021). A study by Bose et al. (2007), which includes data from 1970 to 1980 for developing country economies, presents that government capital expenditure is positively related to economic growth in developing countries.

Another study by Kimaro et al. (2017) emphasizes that the increase in government expenditures positively affects the acceleration of economic growth in low-income African countries based on panel data time series from 2002 to 2015. Also, the study by Shih-Ying et al. (2010) analyzed the relationship between government expenditures and economic growth based on a sample of 182 countries covering the period from 1950 to 2004. The results show that government expenditures significantly affect a country's economic growth. Another study that analyzes the relationship between government expenditures on the military and economic growth in South Asian countries from 1988–2007 (Wijeweera & Webb, 2011) shows that the increase in military-oriented government expenditures affects economic growth by

0.04%, where government expenditures can have a negligible effect on economic growth. Dash et al. (2008) in their study point out that government expenditures positively affect economic growth by analyzing the expenditures and economic growth ratio from 1950 to 2007 in the economy of India. In line with the previous studies, Jiranyakul (2013) reached the same results, using the Granger causality test, by analyzing the relationship between expenditures and economic growth in the Thai economy, and concluded that the increase in government expenditures has a positive effect on economic growth. Another study by Olulu et al. (2014) points out that government expenditures can influence the growth of foreign and domestic investments, and recommends that government expenditures should be focused on health and infrastructure to promote economic development and growth. The study of Batrancea et al. (2021b), emphasizes the importance of the implementation of a green economy policy on economic growth. The findings also reveal significant differences between developing and developed countries.

On the other hand, Hasnul's (2016) study argues that there is a negative correlation between government expenditures and economic growth in Malaysia based on the data from 1970 to 2014. He declares that government expenditures on education, protection, health care, and operational levels do not indicate that they positively affect economic growth. High-interest payments result from governments that have focused on social security and welfare programs, reducing savings, and the reduction in savings negatively affects economic growth. A negative relationship between government expenditures and economic growth was also presented in the study by Lejko and Bojnec (2012). According to Butkiewicz and Yanikkaya (2019), an increase in government expenditures by 1% could affect the reduction of economic growth by 0.1% in developing countries with ineffective governments. Another paper (Villela & Paredes, 2022) analyzed the relationship between government expenditures on education and human capital in economic growth, where the results of this study show that there is no positive correlation between government expenditures on education and economic growth. Furthermore, they emphasize that human capital does not influence economic growth. Chandra (2010) analyzed the relationship between expenditure on education and economic growth in India and declared that economic growth could affect the level of expenditures on education and increasing government expenditures on education could positively affect economic growth. Coman et al. (2023) addressed the relationship between government spending on education and economic growth in a sample of 11 Eastern European countries that were part of the communist regime and are currently members of the European Union. The results of this study reveal a mixed relationship, with effects differing across these countries both in the long-term and short-term periods. However, based on the literature review, only a few authors have addressed the impact of expenditures on economic growth in developing European countries. The study presented by Fetai et al. (2017) analyzed the determinants of economic growth in Western Balkans countries, where the relationship between government expenditures and economic growth is within the framework of econometric models. Moreover, the results of the study identified a negative relationship between government expenditures and economic growth, where the increase in

government expenditures can negatively affect economic growth by -0.39% in the countries of the Western Balkans. Gričar et al. (2019) analyzed the relationship between GDP, SMEs, and the unemployment rate in Croatia and Slovenia. Their findings indicated the absence of a causal relationship in Croatia, whereas, in Slovenia, a bidirectional relationship was observed among these indicators. Subsequently, Gričar et al. (2022) explored macroeconomic flows in Montenegro and Slovenia, revealing how economic development is related to economic growth and how it is correlated with the level of unemployment. The study by Trošt and Bojnec (2016) investigates economic growth by analyzing exports and imports in Slovenia and Estonia. Their research provides compelling evidence that growth in exports positively influences economic growth. Additionally, Batrancea et al. (2022) explored the connection between economic growth and various independent variables including exports, imports, net inflows of foreign investment, net outflows of foreign investment, social contributions, and wages across a sample of 36 European countries from Q3 2018 to Q3 2021. The results indicate a strong correlation between economic growth and these independent variables.

On the other hand, the study by Lupu et al. (2018), which analyzes 10 countries of Eastern and Central Europe that joined the European Union, emphasizes that the increase in government expenditures focused on education and health has a positive effect on economic development. Furthermore, expenditures for defense and public services, as well as those for economic issues, negatively affect the economy, and are an exception based on this study. In line with the previous study, Al-Fawwaz (2015), which applies an econometric methodology based on a simple linear regression approach, concludes that general government expenditures and current expenditures positively affect economic growth and are in complete harmony with the "Keynesian" theory. According to the findings of Alexiou (2009), the increase in government expenditures could positively affect economic growth in Southeast European countries, based on the analysis of seven Southeast European countries from 1995 to 2005. Dudzevičiūtė et al. (2018) examined the correlation between government expenditures and economic growth in European Union countries from 1995 to 2015. The study revealed statistically significant results, indicating a positive relationship between government spending and economic growth in France, Belgium, Portugal, and Cyprus, while a negative relationship was observed in Sweden, Germany, Poland, and Slovakia. On the other hand, another study by Shaddady (2022) related to the relationship between government expenditures and economic growth in Eastern Europe and Central Asia countries shows that the increase in government expenditures negatively affects economic growth.

Also, this study's findings revealed the optimal threshold of government expenditures. Exceeding 13.32% of government expenditures could negatively affect economic growth. The research by Buthelezi (2023) examined the relationship between government expenditures and economic growth in Southern African nations from 1994 to 2021. The findings indicate a negative correlation between government spending and economic growth. This study shows that there are different approaches applied by previous authors. Many studies have analyzed the relationship between government expenditures

and economic growth in developed and developing countries. However, only a few of them (Dudzevičiūtė et al.,2018; Alexiou, 2009; Coman et al.,2023; Lupu et al.,2018; Fetai et al., 2017) have empirically analyzed the impact of government expenditures on economic growth in developing European countries.

3. Methodology and Data

3.1. Research Methodology

The study focuses on data related to general government expenditures, education expenditures, gross savings, and economic growth from 20 developing European countries. According to World Bank statistics, most of these countries have increased government expenditures between the end of 2019 and the beginning of 2022. However, the increase in government expenditures comes from the rapid spread of the COVID-19 pandemic, where developing European countries were forced to finance part of the economic activity due to the economic crisis. Based on these essential indications, the main research aim of the paper is to empirically analyze how the eventual increase in general government expenditures affects economic growth in developing European countries.

To address and test the relationship between government expenditures and economic growth in these countries, two research hypotheses are generated:

H:1 Unbalanced growth of government expenditures can have a negative effect on economic growth in developing European countries.

H:2 Increasing government expenditures on education can have a positive effect on economic growth in developing European countries.

The formulation of hypotheses originated from the research problem, which seeks to elucidate the relationship between government spending and economic growth. Furthermore, the formulation of these hypotheses is rooted in economic theory and from empirical research in the domain (Loizides & Vamvoukas, 2005; Lupu et al., 2018; Dudzevičiūtė et al., 2018; Fetai & Avdimetaj, 2020; Fetai et al., 2020; Friedman, 1997; Barro, 1991; Barro, 1999; Altunc & Aydın, 2013). These hypotheses are consistent with the outcomes of the investigation by Pascual Sáez et al. (2017), which utilized panel data to examine the relationship between government expenditure and economic growth in EU countries. The study applied a 'Random Effects' model, revealing indications of a non-linear correlation between government spending and economic growth for the years 1994-2012. Additionally, Arpaia and Turrini (2008) investigated the relationship between government expenditure and potential output in EU countries.

Their results show a long-term correlation between government expenditures and economic development; however, the long-term elasticity observed is not consistently sustainable across different countries. Ozatac et al. (2017) examined the interplay among economic growth, capital, labor, and government investment in education in France. The findings of their study suggest that heightened government expenditure on education may contribute to economic expansion.

Therefore, to analyze the effect of the increase in government expenditures on economic activity and to support the hypotheses testing of the study, a comprehensive methodology based on econometric models and methods is applied.

The methods used to investigate the relationship between government expenditures and economic growth are OLS, Fixed Effects, Random Effects, Hausman Test, Dynamic Ordinary Least Squares (DOLS), Fully Modified Ordinary Least Squares (FMOLS), and Dynamic Panel Data according to the Arellano Bond and Arellano and Bover tests. Also, to increase the quality of the results, the following tests are applied: the Kurtosis and Skewness, Jarque Berra, VIF, correlation analysis, Breusch and Pagan analysis, Kao panel data cointegration, Pedroni panel data cointegration, and Westerlund panel data cointegration. These methods supported the analysis of how the increase in government expenditures has an impact on the economic growth in developing European countries such as Albania, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Kosovo, Latvia, Lithuania, Macedonia, Moldova, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Ukraine. The used data to test and support the hypotheses are collected from different sources, such as the World Bank, the International Monetary Fund, and the European Central Bank from the period 1995 to 2022.

3.2. Description of Models

In the Ordinary Least Squares "OLS" model, the simplest case of using data and information in the longitudinal form is realized by ignoring the panel structure of the data. Once decision-making units organize the data, then the model can be written as follows:

$$Y = X\beta + \varepsilon \quad (1)$$

The "Fixed Effects" method is applied to analyze the impact of variables that change over time. For example, FE explores the relationship between predictor variables and outcomes within an economic entity Torres-Reyna (2007). The equation for the fixed effects model is as follows:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + \mu_{it} \quad (2)$$

"Random Effects", also called the variance components model, is a statistical model where the model parameters are random variables Torres-Reyna (2007). The reason for using the "Random Effects" model is that it differs from the "Fixed Effects" model. After all, the variation of all subjects involved is assumed to be random and does not correlate with predicted or other independent variables included in the econometric model. If possible changes between the units that have a particular influence on the dependent variable are identified, by using the "Random Effects" then the model is acceptable. The equation for the fixed effects model is as follows:

$$Y_{it} = \beta_1 X_{it} + \alpha_i + \mu_{it} \ \varepsilon_{it} \quad (3)$$

Dynamic Ordinary Least Squares (DOLS) are applied, and can be written through the following equation:

$$\Delta\gamma_t = \beta_0 + \beta_1 t + \gamma y_{t-1} + \sum_{i=1}^{k} \delta_i \Delta\chi_{i,t} + \pi\Delta y_{t-1} + \sum_{i=1}^{k} \theta\Delta y_{t-1} + \mu_t \quad (4)$$

Also, Fully Modified Ordinary Least Squares (FMOLS) is applied. The FMOLS estimator is an extension of the Ordinary Least Squares (OLS) method designed to address endogeneity and serial correlation. The equation for FMOLS is:

$$\Delta\gamma_t = \beta_0 + \beta_1 t + \gamma y_{t-1} + \delta\Delta\chi_{1,t} + +\delta_2\Delta\chi_{2,t} + \delta_k\Delta\chi_{k,t} + \mu_t \quad (5)$$

The Generalized Method of Moments (GMM) is an econometric statistical method that combines observed economic data with information on moment conditions to produce

estimates of unknown parameters within an econometric model.

Since discovering the method (GMM) for linear and non-linear models, it has become widespread in economics and finance. For example, if it is considered the linear regression model, then the equation can have the following form:

$$\gamma_t = z_t'\delta_0 + \varepsilon_{t,}, t = 1,\ldots,\eta \quad (6)$$

The Dynamic Model Method (GMM) is used to test the relationship between general government expenditures and economic growth in developing European countries. The estimators developed by (Arellano & Bond, 1991; Blundell & Bond, 1998; Blundell et al., 2000) are applied. The dynamic estimator "GMM" is the suitable estimator, and the results are interpreted through it because, based on these instruments, the problem of endogeneity is controlled bias caused by the adverse influence derived from GDP.

However, Skewness and Kurtosis are statistical measures used to describe the shape of a distribution (Royston, 1991a; D'Agostino, Belanger, & D'Agostino, 1990). The equation for Skewness is:

$$g_1 = \frac{\sum_{i=1}^{N} x\,(Y_i - \overline{Y})^3/N}{s^3} \quad (7)$$

While equation for Kurtosis is:

$$\frac{\sum_{i=1}^{N} x(Y_i - \overline{Y})^4/N}{s^4} \quad (8)$$

For the panel data test, the cointegration tests developed by Kao and Pedroni (1999) are applied, as well as Westerlund (2005). The Kao test relies on the average of individual unit root test statistics across different cross-sectional units. The equation for the Kao test is:

$$\text{Kt} = \frac{T(Z_1^2 - Z_C^2)}{\sigma^2} \quad (9)$$

The Pedroni test analyses cointegration using group mean panel unit root tests, the equation for the Pedroni test is:

$$\text{t-stat/hom} = \frac{Mean(group\ t-statistics)}{Standard\ Deviation\ (group\ t-statistics)}$$

(Pedroni Test Statistic for Homogeneous Slope)

$$\text{t-stat/het} = \frac{Mean(group\ t-statistics)}{Standard\ Deviation\ (group\ t-statistics)}$$

Pedroni Test Statistic for Heterogeneous Slope

(10)

Based on the research problem and the hypotheses established earlier, the definition of the econometric model is formulated. This model will subsequently analyze the relationship between government expenditures and economic growth in developing European countries. Through the equation below, the econometric model is established as follows:

$$GDP_{it} = \mu + GDP_{(it-1)} + B_1 \text{Government\_ Expenditure}_{it} + B_2\ \text{Education\_Expenditure}_{it} + B_3 BRUTO\_SAV_{it}\gamma_i + \delta_i + \gamma_i + \varepsilon_i \quad (11)$$

In this econometric model, the dependent variable is the GDP (gross domestic product), expressed as the annual percentage of economic growth. These variables address how some independent variables affect economic growth in developing European countries. The independent variable in this econometric model is government expenditures (general government expenditures). The econometric model attempted to analyze how the eventual increase in government expenditures affects economic growth. Recent data and reports from the World Bank show that almost the majority of developing European countries have increased the level of government expenditures in recent years.

Therefore, this model intends to analyze the relationship between government expenditures

and economic growth empirically. Also, in the econometric model, other controlling variables are set, such as government expenditures on education and gross savings. Testing the relationship between government expenditures and economic growth is also applied based on scientific studies that developed and developing countries have offered.

Where some of them provide empirical evidence that the increase in government expenditures positively affects economic growth, and on the contrary, some of them provide arguments that the increase in government expenditures reduces the possibility of economic growth (Fetai et al., 2017; Hasnul, 2016; Butkiewicz & Yanikkaya, 2019; Shaddady, 2022; Lupu et al., 2018; Alexiou, 2009; Al-Fawwaz, 2016). In the assumptions of economic theory, it is noticed that government expenditures can positively affect economic growth due to the increase in aggregate demand.

However, the study aims to provide empirical evidence that the unbalanced growth of government expenditures during periods of economic instability or financial crises can have a negative effect on economic growth in developing European countries.

3.3. Descriptive Statistics

The table below shows the statistical description of the variables that analyze the relationship between government expenditures and economic growth in developing European countries.

The source of data for the variables is from the World Bank and the Central Banks of the countries' governments included in the study, where the coverage period for each variable is from 1995 to 2022. This paper sets all independent variables and the dependent as a percentage concerning economic growth.

Table 2 presents the testing results of observed Skewness/Kurtosis tests

Table 1. The statistical description of exogenous and endogenous variables

Variables	Definition, Description and Source	OBS	Mean	Std.Dev	Min	Max
GDP Growth	The yearly rate of growth in GDP, measured in constant local currency values at market prices, sourced from the World Bank.	523	3.48	6.13	-15.16	88.96
Final Government Expenditure	The annual percentage growth rate of general government final consumption expenditure, is a measure that reflects the change in spending by the government on goods and services over a specific period. The data is sourced from the World Bank.	520	18.7	3.39	9.45	39.28
Government Expenditure Education	The portion of general government spending dedicated to education, including current expenses, capital investments, and transfers. The data is sourced from the World Bank.	345	12.04	3	6.7	28.33
Gross Savings	Gross savings are determined by subtracting total consumption and adding net transfers from gross national income. The data is sourced from the World Bank.	429	19.88	6.16	-8.29	33.84

Source: Calculated by the Authors

Table 2. Results from Skewness/Kurtosis tests for normality distribution

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	Adj chi2(2)	Prob>chi2
Gdpannualg	491	0.0000	0.0000	0	0.0000
Final_gov_ex	486	0.0000	0.0000	62.99	0.0000
Expenditure_edu	317	0.0000	0.0000	0	0.0000
Gross_savings	414	0.0000	0.0000	32.20	0.0000

Source: Calculated by the Authors

Table 3. Results from Jarque and Bera test for normality distribution

Jarque-Bera normality test:	218.7	Chi(2) 3.2
Jarque-Bera test for Ho:	Normality:	

Source: Calculated by the Authors

(Royston,1991a; D'Agostino, Belanger, & D'Agostino,1990), applied in this study to assess the normal distribution of the variables included in the model. Furthermore, the results indicate a normal distribution in the data of the variables. According to econometric principles, accepted values for the skewness estimate should range from -1 to 1, while for the kurtosis estimate, a coefficient above 2 indicates a very high distribution; otherwise, a value of -2 indicates a very flat distribution.

However, the results presented in Table 2 are justified considering that in this study "unbalanced data" are used to develop models for developing European countries. This is because, in the majority of developing European countries, there is a lack of data on macroeconomic indicators for years before (the specified timeframe). This scarcity is attributed to historical events and wars that affected these countries during different periods.

If the p-value is lower than the Chi(2) value, the null hypothesis cannot be rejected. Therefore, the waste is distributed normally. According to the table above, Chi(2) is 3.2, which is greater than 0.05. Based on the results obtained from the Jarque and Bera (1987) test, no alleged violation of the normal distribution of the error terms is observed, as the residuals are found to be normal.

The figure below displays the concentration of residual distribution. The X-axis represents the residuals, while the Y-axis depicts the density of the data set. Thus, this histogram plot confirms the normality test results from the two tests in this paper.

To investigate the correlation between the variables of the econometric model, a correlation analysis is conducted. This analysis reveals the correlation between the variables. The correlation between government spending and GDP is identified as -0.11. Based on the reliability estimator, it is confirmed that this coefficient is reliable. Meanwhile, the correlation ratio between education expenditures and GDP is 0.09, and the correlation ratio between gross savings and GDP is 0.14, both of which also demonstrate statistical reliability. In general, the reliability test for almost all correlations is statistically significant.

The table above displays the results from the Variance Inflation Factor (VIF) test, a diagnostic tool used to assess multicollinearity in regression analysis. Multicollinearity occurs

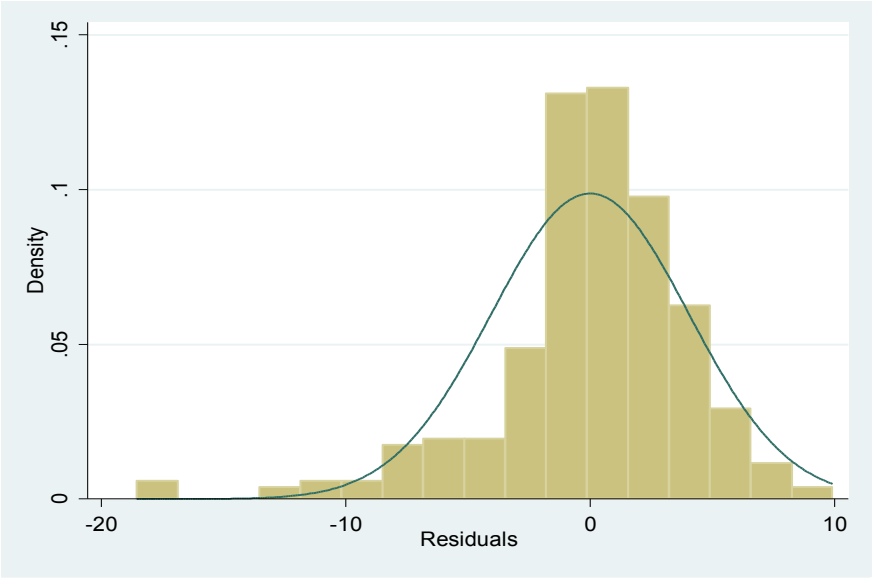

Figure 1. The histogram plot showing the normality distribution of the residuals
Source: Calculated by the Authors

Table 4. Results from Correlate Analysis

Variables	Gdpannualg	Final_gov_ex	Expenditure_edu	Gross_savin
Gdpannualg	1.0000			
Final_gov_ex Sig(0.05)	-0.1181* 0.0074	1.0000		
Expenditure_edu Sig(0.05)	0.0959 0.0756	0.0320 0.5530	1.0000	
Gross_savings Sig(0.05)	0.1420* 0.0033	-0.2441* 0.0000	-0.1484* 0.0094	1.0000

Source: Calculated by the Authors

Table 5. Results from the VIF Test

Variable	VIF	1/VIF
Final_gov_ex	1.02	0.976445
Expenditure_edu	1.02	0.979252
Gross_savings	1.00	0.996644
Mean	1.02	

Source: Calculated by the Authors

when two or more independent variables in the regression model are correlated with each other. A coefficient between 1 and 5 indicates a moderate correlation between a given explanatory variable and other variables within the regression model.

4. Results

The development and interpretation of the main results of the study involve an analysis period of over 25 years. The results and findings are based on several methods and tests that address the relationship between economic growth and government spending, as well as other independent variables for developing European countries. Below, are applied the statistical tests developed by (Breusch & Pagan, 1979; Breusch & Pagan, 1980), which help to investigate whether heteroscedasticity is present in the data of the variables in the econometric model.

The panel data structure in this study takes into consideration data for a long period, and to test for cointegration, the Kao (1999), Pedroni (1999), and Westerlund (2005) panel data cointegration tests are applied. These tests served to investigate whether the time series of data used have a stable relationship. All these tests increase the quality and credibility of the results, as well as make it easier to support the hypotheses of the study. Additionally, several econometric approaches such as Ordinary Least Squares, Fixed Effects, Random Effects, the Hausman Test, Fully Modified Ordinary Least Squares, Dynamic Ordinary Least Squares, and GMM are applied in support of hypotheses testing.

4.1. Empirical Results

In Table 6 results from Breusch and Pagan (1979) lagrangian multiplier test for heteroskedasticity are presented, where Chi2 (3): Indicates the statistical index of the Chi-Square test, while the number 3 indicates the degree of freedom in this test because only three variables are evaluated here.

More specifically, referring to Table 6 the value of this statistical index is 23.52, while the statistical reliability value Prob > chi2 in our specific case is 0.0000, which is less than 0.05, and supported the rejection of the null hypothesis, as well as confirmed that heteroscedasticity is present in all the data.

The results of the Kao (1999) test indicate that the lack of cointegration is not supported. All the tests conducted within the Kao test exhibit very high statistical reliability, suggesting that all panel data are cointegrated.

Likewise, the Pedroni (1999) test shows that there is no missing data cointegration, and all data panels are cointegrated. The results of this test are supported by the instruments used with high statistical reliability.

Table 6. Breusch and Pagan Lagrangian multiplier test for Heteroskedasticity

Ho: Constant Variance		Sd=sqrt(var)
Variables: final_government_expendituregdp expenditure_education grosssavingsgdp		
chi2(3)=	23.52	
Prob > chi2 =	0.0000	

Source: Calculated by the Authors

Table 7. Results from Kao (1999) panel data cointegration test

H0:	**No cointegration**	
Ha:	**All panels are cointegrated**	
Kernel:	**Bartlett**	
Lags:	**1.44 (Newey–West)**	
Augmented lags:	**1**	
Cointegrating vector:	**Same**	
Panel means:	**Included**	
Time trend:	**Not included**	
AR parameter:	**Same**	
	Statistic	**p-value**
Modified Dickey-Fuller t	-6.1291	0.0000
Dickey-Fuller t	-5.7534	0.0000
Augmented Dickey-Fuller t	-5.4035	0.0000
Unadjusted modified Dickey-Fuller t	-9.6112	0.0000
Unadjusted Dickey-Fuller t	-6.7240	0.0000

Source: Calculated by the Authors

Table 8. Results from Pedroni panel data cointegration test

H0:	**No cointegration**	
Ha:	**All panels are cointegrated**	
Kernel:	**Bartlett**	
Lags:	**1.00 (Newey–West)**	
Augmented lags:	**1**	
Cointegrating vector:	**Panel specific**	
Panel means:	**Included**	
Time trend:	**Not included**	
AR parameter:	**Panel specific**	
	Statistic	**p-value**
Modified Phillips–Perron t	-1.7939	0.0364
Phillips–Perron t	-4.8323	0.0000
Augmented Dickey–Fuller t	-4.5959	0.0000

Source: Calculated by the Authors

Table 9. Results from Westerlund panel data cointegration test

H0:	**No cointegration**	
Ha:	**All panels are cointegrated**	
Cointegrating vector:	**Panel specific**	
Panel means:	**Included**	
Time trend:	**Not included**	
AR parameter:	**Same**	
	Statistic	**p-value**
Modified Phillips–Perron t	-1.7790	0.0376

Source: Calculated by the Authors

The Westerlund (2005) test differs slightly from the two tests above because, in this case, it does not necessarily imply that the data panels are cointegrated. Furthermore, the result shows a statistically significant coefficient of 0.0376, which is less than 0.05.

Table 10. Regression results from the relationship between government expenditures and economic growth in developing European countries.

Variables	OLS Ordinary Least Square	FIXED EFFECTS	RANDOM EFFECTS	Hausman Test	DOLS Dynamic Least Squares	FMOLS Modified Least Squares	GMM
GDP_lag T-Statistic							-0.41*** (-5.14)
Government Expenditure T-Statistic	-0.18*** (-2.30)	-0.12*** (-2.20)	-0.13*** (-2.31)	0.0067	-0.15* (-1.25)	-0.08 (-0.78)	-0.16*** (2.65)
Expenditure Education T-Statistic	0.17*** (2.15)	0.12*** (2.26)	0.12*** (2.28)	-0.0018	0.19** (1.63)	0.20*** (1.99)	0.9 (-0.17)
Gross Savings T-Statistic	0.14*** (3.07)	0.09*** (2.67)	0.009*** (2.86)	-0.0068	0.04 (0.60)	0.08* (1.35)	0.05** (1.38)
Constant T-Statistic	1.12 (0.54)	1.81* (1.21)	1.79* (1.11)		2.34 (0.68)	0.18 (0.06)	--
Observation	314	314	314				230
Arellano - Bond test for AR (1)							(-3.26) (0.001)
Arellano - Bond test for AR (2)							(-2.68) (0.007)
Sigma_u		3.22	3.06				
Sigma_e		2.82	2.82				
rho		0.56	0.54				
Sargan Test	-	-	-				(210.10) (0.000)

Variables	OLS Ordinary Least Square	FIXED EFFECTS	RANDOM EFFECTS	Hausman Test	DOLS Dynamic Least Squares	FMOLS Modified Least Squares	GMM
Hausman Test					Chi2(3): 23.52 Prob>chi2: 0.0000		
F-test for Fixed Effects					F(25, 285) = 14.65 Prob > F = 0.0000		

Source: Calculated by the Authors

Note: The significance will be on the T-Statistic coefficient, where parameters 1 to 1.5 results are significant at *, parameters 1.5 to 2 are at **, and over two at ***.

Table 10 presents the results from the regression analysis. It analyzes the relationship between government expenditures and economic growth in developing European countries by applying several models such as Ordinary Least Square, Fixed Effects, Random Effects, Hausman Test, Fully Modified Ordinary Least Square, Dynamic Ordinary Least Square and GMM. The results of all tested models show a high degree of statistical reliability, the Sargan test enables to identification of limitations in the presence of "hetero-scedasticity" with the associated p-value, which examines the validity of the instrumental variables, accepted as healthy instruments to all econometric approaches evaluated. Additionally, to evaluate heteroscedasticity, the test by Breusch and Pagan (1979, 1980) is applied. According to the results in Table 6, the presence of heteroscedasticity in all the data used in this study is identified. Finally, although the results encompass a broad application of econometric methods and tests, the interpretation is focused solely on the Fully Modified Ordinary Least Squares (FMOLS), Dynamic Ordinary Least Squares (DOLS), and the Generalized Method of Moments (GMM) estimator, as developed by Arellano and Bond (1991), Blundell and Bond (1998), and Blundell, Bond, and Windmeijer (2000). The GMM method enables to control for the endogeneity bias problem caused by the inverse effect derived from GDP growth on government expenditures and GDP, as well as on other explanatory variables. To address the endogeneity problem, instrumental variables (IV) or the two steps of the instrumental "GMM" estimator (IV) are used.

Based on the results of the Kao (1999) and Pedroni (1999) tests, there is strong evidence supporting the presence of cointegration among all panel data. The high statistical reliability of these tests indicates a robust relationship among the variables studied, reinforcing the idea that there is no lack of cointegration or missing data cointegration. Likewise, the outcomes of the Skewness/ Kurtosis tests indicate a normal distribution of the data pertaining to the variables included in the econometric model.

According to Table 10, the eventual increase in general government expenditures by 1% can have a negative effect on economic growth by -0.16% in developing European countries, where according to the t-statistics, this coefficient is statistically reliable. Likewise, according to the other models presented in the table above, there is a non-linear relationship between government expenditures and economic growth. Additionally, the Fully Modified Ordinary Least

Squares (FMOLS) and Dynamic Ordinary Least Squares (DOLS) econometric models indicate a negative relationship between economic growth and government spending in developing European countries. Moreover, the DOLS results demonstrate strong statistical robustness, suggesting that government spending may decrease economic growth by -0.15.

Developing European countries have increased government expenditures, especially after 2019, where essential sources of growth have been the spread of the COVID-19 pandemic and the Russia-Ukraine conflict. However, according to empirical results, this increase in government expenditures consists of a negative relationship concerning economic growth in developing European countries. These empirical findings are in harmony with other studies done on developing countries and developed countries, which provide empirical evidence of a negative relationship between government expenditures and economic growth (Pascual Sáez et al.,2017; Hasnul, 2016; Butkiewicz & Yanikkaya, 2019; Villela & Paredes, 2022; Fetai et al., 2017; Fetai et al.,2020; Shaddady, 2022; Buthelezi, 2023; Dincă & Dincă, 2013; Ghosh Roy,2012). Therefore, based on the results of the models according to Table 10, the first hypothesis is accepted, confirming that the unbalanced growth of government expenditures can have a negative effect on economic growth in developing European countries.

On the other hand, the econometric results presented in Table 10 indicate a positive relationship between government spending on education and economic growth. More specifically, a 1% increase in government expenditure on education is likely to enhance economic growth by 0.9% in developing European countries. However, the results provided by the Generalized Method of Moments (GMM) estimator do not demonstrate statistical reliability. Therefore, to enhance the level of statistical robustness, the Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) models are applied to analyze the relationship between government spending and economic growth. More specifically, referring to the coefficient in the (FMOLS) model, shows that an increase in government spending on education positively impacts economic growth by 0.20%, representing a statistically significant coefficient. These results are also in harmony with some studies that have analyzed the relationship between government expenditures on education and economic growth and have found a linear relationship that addresses the positive impact of government expenditures on education in promoting economic growth in developed countries and developing countries: (Villela & Paredes, 2022; Chandra, 2010; Ozatac, 2017; Nunes, 2003; Coman et al.,2023; Ozatac et al.,2017; Bădîrcea et al., 2022; Barro,2001). Therefore, based on the results presented in the table above, the second hypothesis of this study is accepted, which states that increasing government expenditures on education can have a positive effect on economic growth in developing European countries.

The results of the study identify a positive relationship between gross savings and economic growth. An increase in gross savings by 1% can positively affect economic growth by 0.05% in developing European countries. This coefficient expresses high statistical reliability. Additionally, the results from tests conducted using Dynamic Ordinary Least Squares (DOLS) and Fully Modified Ordinary Least Squares (FMOLS) demonstrate a

stable and statistically significant relationship between gross savings and economic growth. The observed results are fully consistent with the economic growth theories proposed by researchers such as Harrod (1951) and Solow (1988), who have examined the relationship between gross savings and economic growth. The obtained results also concur with the findings of Misztal (2011), who identified a positive relationship between gross domestic savings and economic growth in both developed and developing economies. A positive relationship is also observed in studies conducted by (Guma & Bonga-Bonga, 2016; Karahan, 2018; Šubová et al.,2023; Gutierrez & Solimano,2007).

Conclusion and Discussions

This research contributes to an understanding of the relationship between general government expenditures and economic growth in developing European countries. The study considers data from 1995 to 2022, and applies rigorous econometric models such as the Ordinary Least Square, Fixed Effects, Random Effects, Generalized Method of Moments (GMM), Dynamic Ordinary Least Squares (DOLS), and Fully Modified Ordinary Least Squares (FMOLS), alongside various statistical tests such as Skewness and Kurtosis, VIF, Jarque Bera, Kao Test, Pedroni Test, Westerlund Test, Correlation Analysis, Hausman Test, and Breusch and Pagan Test.

The empirical findings reveal a negative relationship between government expenditures and economic growth in developing European countries. The unbalanced growth of government expenditures is identified as a significant factor negatively impacting economic development. Notably, an increase in government expenditures oriented toward social schemes does not exhibit a positive effect on economic growth. The study recognizes a discernible trend of increasing government expenditures in recent years, particularly the post COVID-19 pandemic and the Russia-Ukraine conflict. Despite this surge, the analysis underscores that indiscriminate increases in spending, especially for social schemes, lack positive effects on economic growth.

In contrast, the study highlights a positive relationship between economic growth and increased government expenditures on capital projects, encompassing areas such as renewable energy, technology, tourism, health, modern infrastructure, and education. This emphasizes the need for strategic investments in areas that contribute to economic development. Notably, the positive relationship between government expenditures on education and economic growth underscores the crucial role of education in driving sustainable economic development. Policymakers are encouraged to prioritize educational expenditures during budget planning to foster long-term economic growth.

The study urges developing European countries to control the efficiency of government expenditure distribution. Reductions in expenditures for categories that do not positively influence economic growth are recommended. Financial burdens from high public sector salaries and pensions can impede government funds for capital projects. Challenges include limited data for certain countries, particularly in the Western Balkans. Future research should be focused on specific categories of government spending and identify optimal thresholds for positive economic impacts. Additionally, a broader analysis including developed European countries such as (Germany, France, the

United Kingdom, Italy, Austria, Switzerland, Spain, and Belgium) should be considered for a comprehensive understanding.

The implications of this paper suggest that policymakers are advised to meticulously evaluate the balance and composition of government expenditures to prevent adverse impacts on economic growth. Prioritizing education expenditures is identified as a crucial factor for sustainable economic development. Encouraging gross savings is also recommended as a viable strategy to stimulate economic growth.

In conclusion, the research offers valuable insights for researchers, and practitioners interested in the complex dynamics between government expenditures, education spending, gross savings, and economic growth within developing European countries. The findings provide a foundation for informed decision-making and strategic policy development to foster sustainable economic development.

References

Loizides, J., & Vamvoukas, G. (2005). Government Expenditure and Economic Growth: Evidence from Trivariate Causality Testing. *Journal of Applied Economics,8(1),125-152. https://doi.org/10.1080/15140326.2005.12040621*

Cooray, A.(2009). Government Expenditure, Governance and Economic Growth. *Comparative Economic Studies*, 51(1), 401–418. https://doi.org/10.1057/ces.2009.7

Ono, H. (2014). The government expenditure–economic growth relation in Japan: an analysis by using the ADL test for threshold cointegration. *Applied Economics,46(28), 3523-3531. https://doi.org/10.1080/00036846.2014.932046*

Irmen, A., & Kuehnel, J. (2009). Productive Government Expenditure and Economic Growth. *Journal of Economic Surveys, 23(4), 692-733. https://doi.org/10.1111/j.1467-6419.2009.00576.x*

Kolluri, B.R., Panik, M.J., & Wahab, M.S. (2010). Government expenditure and economic growth: evidence from G7 countries. *Applied Economics,32(8),1059-1068. https://doi.org/10.1080/000368400322110*

Lupu, D., Petrisor, M.B., Bercu,A., &Tofan, M.(2018). The Impact of Public Expenditures on Economic Growth: A Case Study of Central and Eastern European Countries.*Emerging Markets Finance and Trade,54(3),552-570. https://doi.org/10.1080/1540496X.2017.1419127*

Fetai, B. T., Mustafi, B. F., & Fetai, A. B. (2017). An Empirical Analysis of the Determinants of Economic Growth in the Western Balkan. *Scientific Annals of Economics and Business*, 64(2), 245–254. https://doi.org/10.1515/saeb-2017-0016

Alexiou, C.(2009). Government Spending and Economic Growth: Econometric Evidence from the South Eastern Europe (SEE). *Journal of Economic and Social Research 11(1) 2009, 1-16. https://www.researchgate.net/publication/228647975_Government_Spending_and_Economic_Growth_Econometric_Evidence_from_the_South_Eastern_Europe_SEE/link/00463521dc7638d102000000/download*

Dudzevičiūtė, G., Šimelytė, A., & Liučvaitienė, A. (2018).Government expenditure and economic growth in the European Union countries. *International Journal of Social Economics*, 45(2), 372-386. https://doi.org/10.1108/IJSE-12-2016-0365

Barro,R.J., & Sala-I-Martin, X.(1992). Public Finance in Models of Economic Growth. *The*

Review of Economic Studies, 59(4), 645–661. https://doi.org/10.2307/2297991

Grier,K.B., &Tullock,G.(1989). An empirical analysis of cross-national economic growth, 1951–1980. *Journal of Monetary Economics*, 24(2), 259-276. https://doi.org/10.1016/0304-3932(89)90006-8

Blanchard, O., & Perotti, R. (2002). An Empirical Characterization of the Dynamic Effects of Changes in Government Spending and Taxes on Output. *The Quarterly Journal of Economics*, 117(4), 1329–1368. http://www.jstor.org/stable/4132480

Arpaia,A., & Turrini,A.(2008). Government Expenditure and Economic Growth in the EU: Long-Run Tendencies and Short-Term Adjustment. *European Economy Economic, Papers No. 300.* http://dx.doi.org/10.2139/ssrn.1097286

Bose, N.,Haque,E.M., &Osborn,D.R.(2007). Public Expenditure and Economic Growth: A Disaggregated Analysis for Developing Countries. *The Manchester School, 75(5),533-556*. https://doi.org/10.1111/j.1467-9957.2007.01028.x

Kimaro, E., Keong,C.C., & Sea,L.L.(2017). Government Expenditure, Efficiency and Economic Growth: A Panel Analysis of Sub SaharanAfricanLowIncomeCountries.*Economics.*
Wu, S. Y.,Tang, J.H., & Lin,E.S.(2010). The impact of government expenditure on economic growth: How sensitive to the level of development?. *Journal of Policy Modeling,32(6), 804-817. https://doi.org/10.1016/j.jpolmod.2010.05.011*

Wijeweera, A., & Webb, M.J. (2011). Military Spending and Economic Growth in South Asia: A Panel Data Analysis. *Defence and Peace Economics*, 22(1), 545 - 554. DOI:10.1080/10242694.2010.533905

Dash, K.R., & Chandan,Ch. (2008). Government Expenditure and Economic Growth: Evidence from India. The IUP Journal of Public Finance, 0(3), 60-69. https://ideas.repec.org/a/icf/icfjpf/v06y2008i3p60-69.html

Jiranyakul, K. (2013). The Relation between Government Expenditures and Economic Growth in Thailand. *Economic Growth eJournal. DOI:10.2139/ssrn.2260035*

Olulu, R. M., Erhieyovwe, E. K., & Andrew, U. (2014). Government Expenditures and Economic Growth: The Nigerian Experience. *Mediterranean Journal of Social Sciences, 5(10), 89*. https://www.richtmann.org/journal/index.php/mjss/article/view/2871

Hasnul, A.G. (2015): The effects of government expenditure on economic growth: the case of Malaysia. *Munich Personal RePEc Archive.* https://mpra.ub.uni-muenchen.de/id/eprint/71254

Butkiewicz, J.L., & Yanikkaya, H. (2011). Institutions and the Impact of Government Spending on Growth. *Journal of Applied Economics, 14(2), 319-341.* https://doi.org/10.1016/S1514-0326(11)60017-2

Villela,R., &Paredes,J.J.(2022). Empirical Analysis on Public Expenditure for Education, Human Capital and Economic Growth: Evidence from Honduras. *Economies 2022, 10(10), 241*. https://doi.org/10.3390/economies10100241

Al-Fawwaz, T.M. (2015). The Impact of Government Expenditures on Economic Growth in Jordan (1980-2013). *International Business Research*, 9(1). http://dx.doi.org/10.5539/ibr.v9n1p99

Chandra, A. (2010). Does Government Expenditure on Education Promote Economic Growth? An Econometric Analysis. *MPRA Paper, University Library of Munich (No.*

25480). https://mpra.ub.uni-muenchen.de/25480/1/MPRA_paper_25480.pdf

Shaddady, A. (2022). Is Government Spending an Important Factor in Economic Growth? Nonlinear Cubic Quantile Nexus from Eastern Europe and Central Asia (EECA*). Economies 2022, 10(11), 286*. https://doi.org/10.3390/economies10110286

Torres-Reyna, O. (2007). Getting Started in Data Analysis using Stata. http://dss.princeton.edu/training/

Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *The Review of Economic Studies*, 58(2), 277-297. http://www.jstor.org/stable/2297968

Blundell, R., & Bond, S. (1998). GMM Estimation with Persistent Panel Data: An Application to Production Functions*. Econometric Reviews, 19(3), 32, 1-340.*

Blundell, R., Bond, S., & Windmeijer, F. (2000). Estimation in Dynamic Panel Data Models: Improving on the Performance of the Standard GMM Estimator. *Advances in Econometrics, 15, 53-91*. http://dx.doi.org/10.1016/S0731-9053(00)15003-0

Ozatac, N., Taspinar, N., El Rifai, O., & Eren, B. (2017). The Relationship Between Government Expenditure on Education and Economic Growth: The Case of France. *Springer Proceedings in Business and Economics*. https://doi.org/10.1007/978-3-319-68762-9_7

Nunes,A.B. (2003). Government expenditure on education, economic growth and long waves: the case of Portugal. *Paedagogica Historica, 39(5), 559-581*. DOI: 10.1080/0030923032000128791

Solow, R. M. (1988). Growth Theory and After. *The American Economic Review, 78(3), 307–317*. http://www.jstor.org/stable/1809135

Harrod, R. F. (1951). Notes on Trade Cycle Theory. *The Economic Journal, 61(242), 261–275*. https://doi.org/10.2307/2226939

Avdimetaj, K., Marmullaku,B., & Haziri,A. (2021). Impact of Public Investment Through Public Debt on Economic Growth:Empirical Analysis in European Countries in Transition. *Journal Transition Studies Review, 28(2), 93-104.* DOI 10.14665/1614-4007-28-2-006

Nurudeen, A., & Usman,A.(2010). Government Expenditure And Economic Growth In Nigeria, 1970-2008: A Disaggregated Analysis. *Business and Economics Journal,* 1(1),1-11. https://www.hilarispublisher.com/abstract/government-expenditure-and-economic-growth-in-nigeria-19702008-a-disaggregated-analysis-29819.html

Odhiambo, N. M. (2015). Government Expenditure and Economic Growth in South Africa: An Empirical Investigation. Atlantic Economic Journal, 43(4), 393–406. https://doi.org/10.1007/s11293-015-9466-2

Nyasha,S. & Odhiambo,N.(2019).The Impact of Public Expenditure on Economic Growth: A Review of International Literature. Folia Oeconomica Stetinensia,19(2) 81-101. https://doi.org/10.2478/foli-2019-0015

Breusch, T. S., & Pagan, A. R. (1980). The Lagrange Multiplier Test and Its Applications to Model Specification in Econometrics. Review of Economic Studies, 47(2), 239–253.

Breusch, T. S., & Pagan, A. R. (1979). A Simple Test for Heteroscedasticity and Random Coefficient Variation. Econometrica, 47, 1287–1294

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels

with multiple regressors. Oxford Bulletin of Economics and Statistics, 61, 653–670

Kao, C. (1999). Spurious regression and residual-based tests for cointegration in panel data. Journal of Econometrics, 90, 1–44. https://doi.org/10.1016/S0304-4076(98)00023-2.

Westerlund, J. (2005). New simple tests for panel cointegration. Econometric Reviews, 24, 297–316. https://doi.org/10.1080/07474930500243019

D'Agostino, R. B., Belanger, A. J., & D'Agostino, R. B., Jr. (1990). A suggestion for using powerful and informative tests of normality. American Statistician, 44(4), 316–321.

Royston, P. (1991a). Tests for departure from normality. Stata Technical Bulletin, 2, 16–17. Reprinted in Stata Technical Bulletin Reprints, vol. 1, pp. 101–104. College Station, TX: Stata Press.

Jarque, C. M., & Bera, A. K. (1987). A test for normality of observations and regression residuals. International Statistical Review, 55(2), 163–172

Batrancea, L. M., Nichita, A., Balcı, M. A., & Akgüller, Ö. (2023). Empirical investigation on how wellbeing-related infrastructure shapes economic growth: Evidence from the European Union regions. PLoS ONE, 18(4), e0283277. https://doi.org/10.1371/journal.pone.0283277

Batrancea, L. (2021). The Nexus between Financial Performance and Equilibrium: Empirical Evidence on Publicly Traded Companies from the Global Financial Crisis up to the COVID-19 Pandemic. Journal of Risk and Financial Management, 14(5), 218.

Fetai, B., Avdimetaj, K., Bexheti, A., & Malaj, A. (2020). Threshold effect of public debt on economic growth: An empirical analysis in the European transition countries. Zbornik radova Ekonomskog fakulteta u Rijeci/Proceedings of Rijeka Faculty of Economics, 38(2), 381-406. https://doi.org/10.18045/zbefri.2020.2.381

Batrancea, L. M., Balcı, M. A., Akgüller, Ö., & Gaban, L. (2022). What Drives Economic Growth across European Countries? A Multimodal Approach. Mathematics, 10(19), 1-20. https://doi.org/10.3390/math10193660

Fetai, B. ., & Avdimetaj, K. . (2020). Public Debt and Economic Growth in the Western Balkan Countries. Journal Global Policy and Governance, 9(2), 45-56. https://doi.org/10.14666/2194-7759-9-2-004

Batrancea, L. M. (2022). Determinants of Economic Growth across the European Union: A Panel Data Analysis on Small and Medium Enterprises. Sustainability, 14, 4797. https://doi.org/10.3390/su14084797

Batrancea, L., Batrancea, I., & Moscviciov, A. (2009). The Roots of the World Financial Crisis. Annals of the University of Oradea. Economic Sciences, 3, 57–62

Batrancea, L. M., Balcı, M. A., Chermezan, L., Akgüller, Ö., Masca, E. S., & Gaban, L. (2022). Sources of SMEs Financing and Their Impact on Economic Growth across the European Union: Insights from a Panel Data Study Spanning Sixteen Years. Sustainability, 14, 15318. https://doi.org/10.3390/su142215318

Oladele, M. F., Mah, G., & Mongale, I. (2017). The Role Of Government Spending On Economic Growth In A Developing Country. Risk Governance & Control: Financial Markets & Institutions, 7(2,1), 140-146. http://dx.doi.org/10.22495/rgcv7i2c1p2

D'Agostino, G., Dunne, J. P., & Pieroni, L. (2016). Government Spending, Corruption, and Economic Growth. World Development, 84, 190-205. https://doi.org/10.1016/j.worlddev.2016.03.011

Buthelezi, E. M. (2023). Impact of government expenditure on economic growth in different states in South Africa. Cogent Economics & Finance, 11(1). https://doi.org/10.1080/23322039.2023.2209959

Altinok, H., & Arslan, M. O. (2020). The relationship between public expenditures and economic growth in Southeastern European countries: An analysis of bootstrap panel Granger causality. *Economic Computation and Economic Cybernetics Studies and Research*, 54(3), 249-262.

Coman, A. C. (Nuță), Lupu, D., & Nuță, F. M. (2023). The impact of public education spending on economic growth in Central and Eastern Europe: An ARDL approach with structural break. Economic Research-Ekonomska Istraživanja, 36(1), 1261-1278. https://doi.org/10.1080/1331677X.2022.2086147

Serowaniec, M. (2023). The Debudgetisation of Public Finances in Poland After Covid-19 and the War in Ukraine. Politics and Governance, 11(4). https://doi.org/10.17645/pag.v11i4.7242

Lejko, I., & Bojnec, Š. (2012). Internationalization and economic growth in the new member states of the European Union. *Journal of Economics-Ekonomický časopis*, 60(4), 335-348

Gricar, S., Bojnec, S., Karadzic, V., & Backovic, T. (2022). Three decades of macroeconomic flux in Montenegro and Slovenia. Montenegrin Journal of Economics, 18(2), 61-71

Trošt, M., & Bojnec, Š. (2016). Export-led growth: the case of the Slovenian and Estonian economies. Post-Communist Economies, 28(3), 373-383. https://doi.org/10.1080/14631377.2016.1184425

Gričar, S., Šugar, V., & Bojnec, Š. (2019). Small and medium enterprises led-growth in two Adriatic countries: Granger causality approach. Economic Research-Ekonomska Istraživanja, 32(1), 2161-2179. https://doi.org/10.1080/1331677X.2019.1621722

Bojnec, S., & Ferto, I. (2012). Broadband availability and economic growth. Industrial Management & Data Systems, 112(9), 1292-1306. https://doi.org/10.1108/02635571211278938

Friedman, M. (1997). If only the U.S. were as free as Hong Kong. Wall Street Journal, A14. Retrieved from: https://www.wsj.com/articles/SB868305843450108500 (25.10.2018).

Barro, R. J. (1991). Economic growth in a cross-section of countries. Quarterly Journal of Economics, 106, 407–443. DOI: 10.2307/2937943

Barro, R. J. (1999). Determinants of democracy. Journal of Political Economy, 107(S6), S158-S183. doi:10.1086/250107

Altunc, O. F., & Aydın, C. (2013). The Relationship between Optimal Size of Government and Economic Growth: Empirical Evidence from Turkey, Romania, and Bulgaria. Procedia - Social and Behavioral Sciences, 92, 66-75. https://doi.org/10.1016/j.sbspro.2013.08.639

Sáez, M. P., Alvarez-García, S., & Castañeda, D. (2017). Government expenditure and economic growth in the European Union countries: New evidence. In J. Chodkowska-Miszczuk & D. Szymańska (Eds.), Bulletin of Geography. Socio-economic Series, 36, 127–133. DOI: http://dx.doi.org/10.1515/bog-2017-0020

Misztal, P. (2011). The relationship between savings and economic growth in countries with different levels of economic development.

e-Finanse: Financial Internet Quarterly, 7(2), 17-29. ISSN 1734-039X. University of Information Technology and Management, Rzeszów.

Guma, N., & Bonga-Bonga, L. (2016). The relationship between savings and economic growth at the disaggregated level. MPRA Paper

Karahan, Ö. (2018). The Causal Relation Between Savings and Economic Growth in Turkey. In S. Roukanas, P. Polychronidou, & A. Karasavvoglou (Eds.), The Political Economy of Development in Southeastern Europe (Contributions to Economics). Springer. https://doi.org/10.1007/978-3-319-93452-5_8

Šubová, N., Buleca, J., Affuso, E., & Mixon Jr., F. G. (2023). The link between household savings rates and GDP: evidence from the Visegrád group. Post-Communist Economies. https://doi.org/10.1080/14631377.2023.2262688

Bădîrcea, R. M., Manta, A. G., (Florea) Doran, N. M., & Manta, F. L. (2022). Linking the government expenditures to the achievement of the Europe 2020 strategy indicators: Evidence from Central and Eastern European Countries. Technological and Economic Development of Economy, 28(3), 694–715. https://doi.org/10.3846/tede.2022.16526

Batrancea, L., Pop, M. C., Rathnaswamy, M. M., Batrancea, I., & Rus, M.-I. (2021). An Empirical Investigation on the Transition Process toward a Green Economy. Sustainability, 13(23), 13151. https://doi.org/10.3390/su132313151

Gutierrez, M., & Solimano, A. (2007). Savings, Investment and Growth in the Global Age: Analytical and Policy Issues. The American University of Paris Working Paper Series, (43)

Barro, R. J. (2001). Education and economic growth. The contribution of human and social capital to sustained economic growth and well-being, 79(3), 13-41

Dincă, M. S., & Dincă, G. (2013). The impact of government expenditures on economic growth in post-communist countries. Annals of Alexandru Ioan Cuza University - Economics, 60, 126–134

Ghosh Roy, A. (2012). Revisiting the relationship between economic growth and government size. Economics Research International, 2012.

Appendices

Table A1. List of Developing European Countries

Nr	Countries of the Central Europe
1	Estonia
2	Lithuania
3	Latvia
4	Slovenia
5	Czech Republic
6	Poland
7	Bulgaria
8	Belarus
9	Hungary
10	Moldova
11	Romania
12	Slovakia
13	Ukraine
14	Croatia
15	Albania
16	Bosnja and Herzegovina
17	Macedonia
18	Serbia
19	Montenegro
20	Kosovo

Table A2. Description of variables in Developing European Countries

Nr	Variables	Code
1	Gdp Growth (Growth Annual %)	Gdp
2	Final Government Expenditure(% of GDP)	Government_ Expenditure
3	Government Expenditure Education	Education_ Expenditure
4	Bruto Savings (% of GDP)	Bruto_Sav