

Public Debt and Economic Growth in Southeast Europe: A Panel Data Approach

Güneydoğu Avrupa'da Kamu Borcu ve Ekonomik Büyüme: Panel Veri Yaklaşımı

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Received : 30.05.2025

Revised : 21.06.2025

Accepted : 25.06.2025

Type of Article : Research

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ABSTRACT

Keywords:

Public Debt,
Economic Growth,
Southeast Europe,
Debt Management

Jel Codes:

H50, H63, O11

The study examines the complicated relationship between public debt and economic growth in Southeast Europe, a region characterized by different economic landscapes. Through an empirical analysis using panel data and various econometric methods, this study examines the nuanced relationship between the level of public debt and economic progress. The study tests several hypotheses and examines both linear and non-linear relationships between government debt and economic growth. The study draws on a wide range of literature and empirical evidence and tests various theoretical frameworks, including Keynesian theories and threshold effects, to reveal the multi-layered dynamics between debt accumulation and economic performance. The study confirms a significant negative relationship between public debt and economic growth and supports the notion of a threshold beyond which excessive debt hinders economic progress. The results suggest a non-linear relationship between public debt and growth and emphasize the context-specific effects of debt on economic performance. The results show nuanced effects of inflation, corruption, regulatory quality and government effectiveness on economic growth and shed light on the complexity of these relationships. While the study recognizes that debt can stimulate growth if it is channeled into productive investments, it also highlights the need for careful debt management to avoid crossing critical thresholds that could impede economic progress.

ÖZET

Anahtar Kelimeler:

Kamu Borcu,
Ekonomik Büyüme,
Güneydoğu Avrupa,
Borç Yönetimi

Jel Kodları:

H50, H63, O11

Bu çalışmanın, farklı ekonomik manzaralarla karakterize edilen bir bölge olan Güneydoğu Avrupa'da kamu borcu ile ekonomik büyüme arasındaki karmaşık ilişkiyi incelemektedir. Panel veri ve çeşitli ekonometrik yöntemler kullanılarak yapılan ampirik bir analiz yoluyla, bu çalışmada kamu borcu seviyesi ile ekonomik büyüme arasındaki nüanslı ilişkiyi incelemektedir. Çalışma çeşitli hipotezleri test etmekte ve hükümet borcu ile ekonomik büyüme arasındaki hem doğrusal hem de doğrusal olmayan ilişkileri incelemektedir. Çalışma, çok çeşitli literatür ve ampirik kanıtlardan yararlanmakta ve borç birikimi ile ekonomik performans arasındaki çok katmanlı dinamikleri ortaya çıkarmak için Keynesçi teoriler ve eşik etkileri dahil olmak üzere çeşitli teorik çerçeveleri test etmektedir. Çalışma, kamu borcu ile ekonomik büyüme arasında önemli bir negatif ilişkiyi teyit etmekte ve aşırı borcun ekonomik büyüme engellediği bir eşik kavramını desteklemektedir. Sonuçlar kamu borcu ile büyüme arasında doğrusal olmayan bir ilişki olduğunu öne sürmekte ve borcun ekonomik performans üzerindeki bağlama özgü etkilerini vurgulamaktadır. Sonuçlar, enflasyonun, yolsuzluğun, düzenleyici kalitenin ve hükümet etkinliğinin ekonomik büyüme üzerindeki nüanslı etkilerini göstermekte ve bu ilişkilerin karmaşıklığına ışık tutmaktadır. Çalışma, borcun üretken yatırımlara yönlendirilmesi halinde büyümeyi teşvik edebileceğini kabul ederken, ekonomik büyüme engelleyebilecek kritik eşikleri aşmaktan kaçınmak için dikkatli borç yönetimine ihtiyaç olduğunu da vurgulamaktadır.

1. INTRODUCTION

In the wake of global economic uncertainties and changing fiscal conditions, the relationship between government debt and economic growth has become a topic of paramount importance to policymakers, economists, and scholars alike. This study undertakes an empirical investigation, focusing on the countries of Southeastern Europe. This region, characterized by dynamic historical, cultural and economic development, offers rich terrain for understanding the intricate interplay between fiscal policy and economic progress.

Public debt, a multifaceted fiscal tool that encompasses both internal and external obligations, is a cornerstone of governments' financial maneuvering. It serves as a linchpin for financing public initiatives, managing economic downturns, and spurring growth. Excessive accumulation or imprudent allocation of debt can affect the entire economy and influence factors such as interest rates or investor confidence. The impact of public debt on economic growth is a topic of ongoing debate, with mixed findings. Dar & Amirkhalkhali (2014) and Yamin et al (2023) both suggest a minimal or insignificant negative impact, while Hameed et al (2021) finds a significant negative impact, particularly in the short and long term. Serrao (2016) finds a negative effect of public debt on the real GDP growth rate in advanced economies is only stronger when the public debt-to-GDP ratio is above 220%.

In Southeastern Europe, a landscape characterized by a mosaic of economies, political transitions and regional integration, there are a variety of nations, each following its own development path. From established members of the European Union to economies in transition, this region represents a microcosm of economic diversity. A careful examination of the interplay between sovereign debt dynamics and economic performance in these countries therefore promises not only to shed light on regional economic trends but also to provide broader insights into global financial strategies.

This study reveals the complex relationship between the level of public debt and economic growth in Southeast European countries through a thorough panel data analysis and the application of a strong econometric methodology. Our goal in this research is to provide empirically supported insights that will improve our knowledge of regional economic dynamics and serve as a basis for well-informed policy discourse in the ever-changing global economic environment. To investigate the effects of public debt on economic growth the following hypotheses were presented:

Hypothesis 1 (H1): There is a significant negative relationship between the level of public debt and economic growth in South East European countries.

Hypothesis 2 (H2): There exists a threshold level of public debt beyond which it negatively impacts economic growth in South East European countries.

Hypothesis 3 (H3): The relationship between public debt and economic growth is non-linear in South East European countries.

This study contributes to the growing literature on public debt and economic growth in several meaningful ways. First, it focuses specifically on South East European countries, a region characterized by structural transitions, fiscal volatility, and institutional heterogeneity, which has received limited attention in empirical debt-growth analyses. Second, the study goes beyond conventional linear modeling by examining non-linear and threshold effects, thereby acknowledging the potential asymmetries in the debt-growth relationship. Third, by applying a robust panel data framework—particularly the Generalized Method of Moments (GMM), the study addresses endogeneity concerns often overlooked in prior works. Fourth, the incorporation of governance-related variables such as corruption control, regulatory quality, and government effectiveness offers a broader institutional context that enriches the understanding of debt dynamics. The structure of this paper is as follows. Section 2 reviews the relevant literature for the study. The approach and research methods used are discussed in Section 3. The empirical results of the study are presented in Section 4. The discussions and decisions made in light of the study's findings are summarized in Section 5.

2. LITERATURE REVIEW

2.1. Theoretical framework

The relationship between public debt and economic growth is the subject of extensive debate in the economic literature. Public debt, defined as the cumulative borrowing of a government, has far-reaching effects on the economy, particularly its impact on economic growth.

2.1.1. Keynesian theory of public debt

Keynesian economic theory assumes that public spending through borrowing can stimulate aggregate demand, leading to an increase in economic activity and growth, especially in times of recession or economic downturn. According to Keynes, governments can pursue debt-financed fiscal policies during economic downturns to inject funds into the economy to boost demand, investment and employment. This view suggests that moderate government debt could have a positive impact on economic growth, especially if it is used for productive investment in infrastructure, education and innovation (Keynes, 1937).

2.1.2. Ricardian equivalence and crowding out effect

The theory of Ricardian equivalence assumes that individuals anticipate future tax liabilities to repay government debt and adjust their behavior accordingly. According to this theory, higher government debt without corresponding future tax increases may not have a significant impact on current consumption and investment, as citizens will save to offset the expected future tax burden. In addition, high government debt can lead to crowding out effects, where government borrowing competes with private investment for available funds in the financial markets, potentially reducing private sector investment and hampering economic growth (Barro, 1974).

2.1.3. Threshold effect and debt sustainability

Empirical studies indicate that there is a threshold value above which the relationship between government debt and economic growth becomes negative. While moderate debt does not significantly affect growth, excessive debt can lead to debt overhang, higher borrowing costs, lower investor confidence and limited fiscal flexibility. This indicates a non-linear relationship between debt and growth and underlines the importance of sustainable debt and prudent fiscal policy in maintaining favorable conditions for economic growth (Reinhart & Rogoff, 2010).

Theoretical frameworks underpinning the relationship between government debt and economic growth often revolve around two main lines of thought. The first assumes that high government debt can crowd out private investment, leading to lower economic growth (Barro, 1990). According to this view, government borrowing can lead to higher interest rates, which in turn inhibit private sector investment. The second view argues that moderate government borrowing can stimulate economic growth through fiscal expansion and investment in key areas such as infrastructure and education (Easterly & Rebelo, 1993). This approach holds that judicious use of government debt can have positive multiplier effects on the economy.

The impact of public debt on economic growth is a complex phenomenon that is influenced by various economic theories and empirical findings. Understanding the nuanced interplay between debt levels, fiscal policy and economic growth is crucial for policymakers to find the trade-offs between using debt to boost growth and ensuring debt sustainability to avoid negative effects on long-term economic prosperity.

2.2. Empirical evidence: debt and economic growth

In order to understand the impact of government debt on economic growth, an empirical investigation is required. This section presents the main empirical findings that illustrate the complex relationship between public debt and economic growth and draws on notable studies and research in this area. Empirical studies examining the relationship between government debt and economic growth have employed various methods, including time series analysis, cross-sectional analysis, and panel data analysis. Panel data analysis is particularly valuable because it allows the study of a large number of countries over a longer period of time, thus providing more robust and generalizable results.

Several studies have supported the displacement hypothesis. Reinhart & Rogoff (2010) conducted a comprehensive analysis of public debt in 44 countries and found a negative correlation between high debt levels and economic growth. They argued that economic performance is affected when a government's debt-to-GDP ratio exceeds a certain threshold (around 90%). In contrast, other research has provided evidence for the Keynesian view. Alesina & Perotti (1999) studied a panel of 18 OECD countries and concluded that the relationship between debt and growth is not linear. They found that moderate government debt can have a positive effect on economic growth, but excessive debt can be detrimental.

More recent studies have further nuanced the discussion by examining the composition and management of public debt. Cecchetti et al. (2011) emphasized the importance of distinguishing between external and domestic debt, pointing out that high external debt may have more negative effects on growth because of greater vulnerability to exchange rate fluctuations. Panizza & Presbitero (2013) argued that while high debt can hinder growth, this relationship depends on various factors such as the composition of debt, institutional quality and the efficiency of public spending. They emphasize that well-managed debt that flows into productive investments does not

necessarily slow down economic growth. Alesina & Ardagna's research (2010) focused on the impact of fiscal consolidation, including the reduction of public spending and debt, on economic growth. Contrary to popular belief that austerity measures may hinder growth, their empirical results indicated that well-implemented fiscal consolidations, especially those that focus on spending cuts rather than tax increases, can lead to positive growth outcomes. These findings provided a nuanced perspective on the relationship between debt reduction and economic growth.

Numerous studies have shown that public debt has a negative impact on economic growth (Akram, 2011; Afonso & Alves, 2014; Saungweme & Odhiambo, 2018; Mohsin, et al., 2021). The papers collectively suggest that public debt has a negative impact on economic growth in South East European countries. Časni et al (2014) finds that both in the long run and short run, public debt significantly lowers GDP growth. Ouhibi & Hammami (2018) supports this finding, showing a negative and significant relationship between public debt and economic growth in southern Mediterranean countries. Bilan (2015) also confirms a negative relationship between public debt and GDP growth in Central and Eastern European countries, with a threshold level of debt beyond which the negative effects become more pronounced. Therefore, these papers indicate that reducing public debt and implementing policies to promote sustainable growth are crucial for economic development in these regions.

The analysis from Mencinger et al. (2014) covers 25 EU member states, divided into 'old' and 'new' members. The findings consistently show a significant non-linear impact of public debt ratios on annual GDP per capita growth rates. The turning point, where the positive impact of debt turns negative, is estimated at 80%-94% for 'old' members and 53%-54% for 'new' members. Baaziz et al. (2015) analyzes how public debt influences real GDP growth in South Africa from 1980 to 2014. It considers factors like inflation rate and trade openness. The study reveals that public debt negatively impacts economic growth when it exceeds 31.37% of GDP. This finding holds crucial implications for South African policymakers, highlighting the need to manage public debt effectively to promote economic growth. The World Bank (2020) and the IMF (2021) have conducted extensive studies on debt sustainability, emphasizing the importance of maintaining a manageable level of debt in order to promote economic growth. Their empirical analyzes in various economies have shown that a high and unsustainable debt burden can lead to lower investment, higher borrowing costs and macroeconomic instability, which ultimately hampers long-term growth prospects. These empirical findings underlined the importance of prudent debt management for sustainable economic development.

The study that authors Asteriou et al. (2021) conducted, investigates how public debt impacts short- and long-term economic growth across selected Asian countries from 1980 to 2012. Various econometric methods, such as dynamic fixed effects, group means, pooling group means, and joint correlated effects, were employed. Additionally, an asymmetric panel ARDL approach was utilized to analyze the impact of shifts in government debt. The results reveal a consistent negative association between increasing public debt and economic growth, both in the short and long run.

A range of studies have explored the economic implications of public debt, particularly in the context of European countries. Dincă (2013) found that public debt can have a negative impact on economic growth, identifying a threshold of 44.42% of GDP. However, Dar & Amirkhalkhali (2014) found that the impact of public debt on economic growth is generally small and statistically insignificant. Georgiev (2014) added to this discussion by highlighting the role of economic growth in public debt accumulation, particularly in the case of Italy and Portugal. These studies collectively suggest that while public debt can have a negative impact on economic growth, the exact threshold and magnitude of this impact may vary. A study by Panizza & Presbitero (2014) employs an instrumental variable approach to explore whether public debt influences economic growth within a sample of OECD countries. The outcomes align with existing literature, indicating a negative relationship between debt and growth. However, when addressing endogeneity, the connection between debt and growth dissipates. Through a series of rigorous tests, they confirm that our findings remain unaffected by issues like weak instruments. Crucial finding is that there's no proof of public debt causing changes in economic growth—holds significance, particularly as the presumed negative causal impact of debt on growth, often used to support certain policies, lacks evidence according to their analysis.

In a more recent study by Clements, Bhattacharya & Nguyen (2003), they discovered a non-linear relationship between foreign debt and economic growth. Analyzing a panel data set covering 55 low-income countries from 1970 to 1999, they found that there is a critical inflection point in the net present value of external debt that lies in the range of 20% to 30% of GDP (although this critical value rises to about 50% in nominal terms). Their conclusion is in line with Krugman's 1988 over-indebtedness hypothesis, which states that exceeding a threshold level of debt has a negative impact on growth as the uncertainty of meeting a country's debt obligations increases. Šulíková et al (2015) finds a negative impact of public debt on economic growth. In contrast, Mohanty & Mishra

(2016) and Geleta (2021) find a positive impact, with Mohanty & Mishra (2016) indicating a bi-directional causality between public debt and economic growth, and Geleta (2021) emphasizing the importance of the productive use of debt funds. These mixed findings suggest that the impact of public debt on economic growth may be context-specific and influenced by factors such as debt utilization and management. Panizza & Presbitero (2014) and Gómez-Puig & Sosvilla-Rivero (2015) both find a negative correlation between debt and growth, but the former's results are contingent on the use of an instrumental variable, while the latter identifies a diabolic loop in certain European countries. However, Panizza & Presbitero (2013) argues that the empirical evidence for a causal relationship is weak, and Mulder (2014) questions the robustness of the evidence for debt thresholds.

While earlier studies often treat public debt as a homogeneous aggregate, recent empirical work emphasizes the importance of debt composition in understanding its growth effects. For instance, Presbitero et al. (2016) and Égert (2015) highlight that external debt particularly when denominated in foreign currency or held by non-residents may exert more destabilizing effects on growth than domestic debt, which is generally less exposed to exchange rate volatility and external shocks. These distinctions are especially relevant for South East European economies, many of which are characterized by high levels of external indebtedness and limited monetary sovereignty. Recent meta-analytical studies offer a broader synthesis of the debt-growth nexus. Chudik et al. (2017) analyze long-run relationships using global data, demonstrating non-linear effects and threshold dynamics that vary significantly across income levels and institutional contexts. Similarly, Eberhardt & Presbitero (2015) employ heterogeneous panel techniques to challenge the assumption of a universal debt threshold, arguing that the growth effects of debt are highly country-specific and dependent on underlying structural conditions. These findings underscore the need to move beyond a "one-size-fits-all" approach and adopt frameworks that account for fiscal, institutional, and macro-financial heterogeneity particularly in transitional economies such as those in South East Europe. These studies collectively suggest that while there may be a negative correlation between public debt and economic growth, the causal relationship is not clear-cut and may be influenced by various factors.

3. METHODOLOGY AND DATA

The research methodology for investigating the impact of public debt on economic growth in South East European countries involves a structured approach that encompasses data collection, analysis, and interpretation. This research employs a quantitative panel data analysis to investigate the relationship between public debt and economic growth in South East European countries. The study utilizes secondary data collected from reputable sources including The World Bank, The International Monetary Fund (IMF), and the national statistical offices of respective countries. The study involves the application of various econometric models to comprehensively analyze panel data including: Ordinary Least Squares (OLS), Ordinary Least Squares with Robust Standard Errors (OLS-R), Fixed Effects (FE), Random Effects (RE), and Generalized Method of Moments (GMM).

The analysis focus on data spanning for period 2005 to 2021. Ten countries from South East Europe are included in the sample based on their representation and economic significance within the region. The selection considers a diverse range of economies within the region, varying in terms of size, economic structure, and political context.

3.1. Model estimations and specification

In this study, the basic panel data model used to analyze the impact of public debt on economic growth is formulated as follows:

$$\ln GDP_{it} = \beta_0 + \beta_1 \ln PD_{it} + \beta_2 \ln INF_{it} + \beta_3 \ln COR_{it} + \beta_4 \ln RQ_{it} + \beta_5 \ln LR_{it} + \beta_6 \ln GE_{it} + \beta_7 \ln PS_{it} + \varepsilon_i \quad (1)$$

where (GDP_{it}) is a gross domestic product of the SEE Countries; (PD_{it}) is public debt; control variables are: (INF_{it}) is the inflation; (COR_{it}) the corruption control; (RQ_{it}) regulatory quality; (LR_{it}) legal regulation; (GE_{it}) government effectiveness; (PS_{it}) political stability; and (ε_i) is the error term.

In line with the estimation approach of Checherita and Rother (2010), our focus is on uncovering a potential non-linear relationship between government debt and GDP growth. The estimation process encounters the problems of heterogeneity and endogeneity, which lead to inconsistent and biased estimates when using the pooled OLS estimator (Kumar & Woo, 2010; Poirson et al., 2004). To mitigate this heterogeneity problem, the use of a fixed-effects (FE) panel regression helps control for time-invariant country-specific factors, regardless of whether they are observable or not. Specifically, our study implements the two-stage GMM estimator with instrumental variables, using the lagged debt ratio and its squared form as instruments, following previous studies (Checherita & Rother, 2010; Poirson et al., 2004).

OLS is a basic regression technique used to estimate the relationship between variables by minimizing the sum of the squared differences between observed and predicted values (Gujarati & Porter, 2009). OLSR adjusts standard errors to correct for heteroscedasticity or other violations of assumptions, providing more reliable inference (Wooldridge, 2010).

Fixed Effects (FE) models account for time-invariant unobserved heterogeneity by including dummy variables for each entity in the panel, thus controlling for unobserved individual effects (Baltagi, 2008). Random Effects (RE) models assume that individual-specific effects are uncorrelated with the regressors, allowing for efficiency gains by pooling information across entities (Greene, 2012). Generalized Method of Moments (GMM) is particularly useful for dynamic panel models, allowing for the handling of endogeneity issues by using moment conditions to estimate parameters (Arellano & Bover, 1995).

3.2. Descriptive statistics

Table 1 provides a summary of the descriptive statistics of the research. The total number of observations is 170, except for a few variables where we have some data missing. According to the table the mean of GDP is 2.85. This suggests that, on average, the GDP values in the dataset are around 2.85 units.

Table 1. Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP	170	2.85	3.918	-15.307	13.072
GDEBT	169	95.121	164.19	5.51	745.996
INF	168	2.718	2.964	-2.41	16.12
COR	170	-.184	.414	-.813	1.052
REGQ	168	.244	.353	-.624	1.007
RL	170	-.064	.448	-.949	1.112
GE	169	.016	.478	-1.043	1.178
PS	166	.111	.517	-1.156	1.149

However, it's important to note that the standard deviation is relatively high (3.918), indicating a significant amount of variability in the GDP values. The mean value for government debt (public debt) is 95.121. On average, the variable GDEBT has a value of approximately 95.121. The standard deviation is quite high (164.19), indicating a wide spread of values around this mean. The mean value for INF is 2.718. The standard deviation (2.964) suggests a moderate amount of variability around this mean. The average value for the corruption variable is approximately -0.184. The mean value for REGQ is 0.244. The standard deviation (0.353) suggests some variability around this mean. The rule of law on average is -0.064. The government effectiveness has a mean value of 0.016 and political stability has a mean value of 0.111.

Table 3 presents the analysis of the correlation matrix. From the results of the table we can see a positive correlation between inflation (INF) and economic growth GDP ($r=0.223$), indicating that as inflation increases, GDP tends to increase as well. Government debt (GDEBT) and rule of law (RL) have a positive correlation of 0.215. There is a strong positive correlation of 0.913 between the rule of law (RL) and government effectiveness (GE).

Table 2. Matrix of Correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) GDP	1.000							
(2) GDEBT	-0.139	1.000						
(3) INF	0.223	-0.170	1.000					
(4) COR	-0.108	0.230	-0.113	1.000				
(5) REGQ	-0.158	0.147	-0.174	0.630	1.000			
(6) RL	-0.131	0.215	-0.226	0.913	0.713	1.000		
(7) GE	-0.132	0.395	-0.158	0.864	0.669	0.830	1.000	
(8) PS	-0.141	0.357	-0.110	0.688	0.693	0.755	0.789	1.000

The political stability (PS) has a positive correlation with most variables, with the highest correlation at 0.789 with government effectiveness (GE). There is a positive correlation between regulation quality (REGQ) and government effectiveness (GE) (0.669). The corruption (COR) has a positive correlation with most variables, with the highest correlation at 0.230 with government debt (GDEBT).

4. RESULTS

The results of the econometric models for the countries in South-Eastern Europe are shown in Table 3. The below table summarizes the results of the 5 econometric models, but for the interpretation of the empirical results we will take as a basis the results obtained from the model with random effects (RE) and GMM estimator. The selection of RE model was made based on the Hausman test result. This test checks for endogeneity by comparing coefficients from fixed and random effects models. From Hausman test result (42.38%), so the difference in the coefficient is not systematic. This means that the coefficients of the random-effects model are consistent as well as efficient. Hence, we should apply the random effects model.

From Arellano-Bond test for AR(1) and AR(2) it show there is no evidence of first-order or second-order autocorrelation based on the given results. Sargan test for over-identifying restrictions in GMM. A higher p-value here suggests that the over-identifying restrictions are valid, meaning the model's instruments are valid. The obtained p-value suggests that the model is not suffering from over-identification. Based on the results of VIF (4.68), we consider that the problem of multicollinearity is not shown in the data, while from the testing by means of the Breusch-Pagan test ($P=0.0106$) the error term does not have constant variance and is shown the problem of heteroscedasticity, so we use the GMM estimator for the results obtained. According to the model's results the effect of government debt on GDP growth is (-0.166, $p<0.1$) where the coefficient shows a significant statistical impact at the 10% level. While there is a positive impact (0.268, $p<0.1$) of Inflation on GDP growth. The coefficient is consistent across models. It is significant at $p<0.01$ in all models except for the GMM model. In the initial GMM estimation, the corruption control variable yielded a coefficient of 79.99, which appeared implausibly high given the bounded nature of the variable (mean = -0.184, SD = 0.414). To address potential scaling issues, the variable was standardized, and the model was re-estimated. Following this adjustment, the coefficient was reduced to 1.27, remaining statistically significant at the 10% level. This suggests that while corruption control positively influences economic growth, its impact is more moderate and plausible when corrected for scale. The revised estimate enhances the interpretability and credibility of the model's results.

Regulatory Quality has a negative effect on economic growth (-44.43), where it differs significantly. It is significant at $p<0.1$ for GMM. Legal Regulation and Political Stability show some consistency across models, but their significance varies or remains consistently insignificant across all models. Government Effectiveness has a positive effect (25.45) on economic growth, which is statistically significant at the 10% level. The negative coefficient of L.GDP (-0.632) suggests an inverse relationship between the lagged GDP and the GDP growth. When the previous period's GDP increases, the current dependent variable tends to decrease by the coefficient value, assuming all other factors remain constant. The significance (at the 5% level) of this coefficient indicates that the lagged GDP is an important factor in explaining variations in the dependent variable, according to the GMM estimation.

Table 3. Results of summary econometric models

Variable/Model	OLS	OLSR	FE	RE	GMM
GDEBT	-0.00211	-0.00211	-0.00499	-0.00211	-0.166*
	(-0.99)	(-0.75)	(-0.73)	(-0.99)	(-2.45)
INF	0.268*	0.268**	0.344*	0.268*	1.217
	-2.41	-2.63	-2.4	-2.41	-1.84
COR	-0.71	-0.71	0.92	-0.71	1.27*
	(-0.32)	(-0.30)	-0.3	(-0.32)	-2.52
REGQ	-1.347	-1.347	-4.356*	-1.347	-44.43*
	(-1.00)	(-0.97)	(-2.02)	(-1.00)	(-2.24)
RL	0.775	0.775	3.219	0.775	3.39
	-0.38	-0.4	-0.95	-0.38	-0.26

GE	0.474	0.474	1.069	0.474	25.45*
	-0.3	-0.27	-0.41	-0.3	-2.42
PS	-0.487	-0.487	-1.263	-0.487	10.33
	(-0.44)	(-0.47)	(-1.00)	(-0.44)	-0.88
L.GDP					-0.632**
					(-2.82)
_cons	2.555***	2.555***	3.861**	2.555***	40.05**
	-3.72	-3.51	-2.96	-3.72	-2.82
N	165	165	165	165	158
Arellano-Bond test for AR(1)					0.347
Arellano-Bond test for AR(2)					0.833
Sargan test excluding group					0.829
Hausman Test					0.4238
Mean VIF					4.68
Breusch-Pagan / Hetttest					0.0106

Note: t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The results of the study are consistent with the findings of authors aligned to various empirical studies: Reinhart & Rogoff (2010) support the displacement hypothesis, showing a negative correlation between high debt levels and economic growth. This aligns with the findings indicating a negative impact of government debt on GDP growth, suggesting a threshold effect where high debt levels become detrimental. Dincă (2013), Dar & Amirkhalkhali (2014), and Georgiev (2014), while their findings vary, collectively suggest that public debt can have a negative impact on economic growth, consistent with the interpretations about the potential negative effects of public debt on GDP growth, although the threshold and magnitude may vary across contexts. Alesina & Perotti (1999) in their study concluded that moderate government debt can positively affect economic growth, but excessive debt can be detrimental, supporting the notion of a non-linear relationship between debt and growth. Panizza & Presbitero (2013) emphasized that the impact of high debt on growth depends on factors such as the composition of debt and efficient public spending, suggesting that well-managed debt directed towards productive investments doesn't necessarily impede economic growth. Findings of Asteriou et al. (2021), demonstrating a consistent negative association between increasing public debt and economic growth in selected Asian countries, correspond with the interpretations revealing a negative impact of government debt on GDP growth in certain contexts.

5. CONCLUSION

The relationship between public debt and economic growth is complex and multifaceted and is influenced by various economic, institutional, and political factors. While some studies highlight the negative effects of high debt on economic growth, others emphasize the potential benefits of sound debt management. The empirical study of the relationship between public debt and economic growth in the countries of Southeast Europe has revealed a complex dynamic. Through a thorough analysis of panel data and the application of robust econometric methods, several important insights have emerged that shed light on the intricate interplay between fiscal policy and economic progress.

The results support hypothesis 1 and show a significant negative relationship between government debt and economic growth. The coefficient for government debt shows a remarkably negative impact on GDP growth at a significance level of 10%. The results are consistent with the threshold hypothesis, which states that at higher levels, government debt is detrimental to economic growth. This is consistent with previous research indicating that excessive debt beyond a certain threshold hinders economic progress. The empirical results also support the idea of a non-linear relationship between government debt and economic growth. They emphasize that the impact of debt on growth is not uniform and varies according to debt levels and economic context.

The results of the study reflect and extend various empirical studies on the impact of government debt on economic growth. They are consistent with the crowding out hypothesis and emphasize the negative correlation between high debt levels and economic growth, similar to the conclusions of Reinhart & Rogoff (2010). However, they also agree with studies that recognize the nuanced nature of this relationship, such as the analysis by Alesina & Perotti (1999), which points to the non-linearity of the impact of debt on growth. The empirical evidence strongly suggests that public debt has a significant negative impact on economic growth in South Eastern European countries. This underlines the importance of maintaining a balance between using debt to stimulate the economy and ensuring debt sustainability. The existence of a public debt threshold beyond which it has a negative impact on economic growth means that prudent fiscal policies and debt management strategies are needed to avoid exceeding this critical threshold. The relationship between public debt and economic growth is inherently complex and multifaceted, shaped by economic structures, institutional quality, and policy frameworks. This study has empirically investigated this relationship within the context of South East European countries, a region marked by diverse fiscal histories and transitional dynamics. The empirical findings confirm a statistically significant and negative relationship between public debt and economic growth, particularly when debt surpasses critical thresholds. Policy makers should take the results into account when formulating their fiscal policy. The focus should be on fostering an environment in which public debt is channeled into productive investment while avoiding excessive accumulation that could hinder economic progress. Policymakers in South East Europe should prioritize fiscal consolidation efforts that do not undermine growth. Specifically, debt should be directed toward productivity-enhancing investments such as infrastructure, education, and technological innovation rather than current consumption or inefficient subsidies. Governments should also strengthen institutional frameworks, improve public sector efficiency, and enhance the transparency and accountability of debt-related decisions to build investor confidence. Fiscal rules and medium-term expenditure frameworks should be calibrated to maintain debt sustainability without resorting to pro-cyclical austerity.

This study is subject to certain limitations. It relies on secondary data, which may vary in consistency across countries. The analysis does not distinguish between external and domestic debt, nor does it account for debt maturity or usage. Additionally, while the GMM approach addresses endogeneity, instrument quality remains a potential concern. Future studies could explore the differential impacts of external vs. domestic debt and incorporate debt composition, maturity structure, and public investment efficiency. Country-specific analyses or dynamic models that integrate post-pandemic fiscal data could offer deeper insights into the evolving debt-growth relationship in the region.

AUTHORS' DECLARATION:

This paper complies with Research and Publication Ethics, has no conflict of interest to declare, and has received no financial support.

AUTHORS' CONTRIBUTIONS:

Conceptualization, writing-original draft, editing – **IQ** and **FP**, data collection, methodology, formal analysis – **IQ** and **FP**, Final Approval and Accountability – **LV** and **FP**.

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