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Investigating the Determinants of Public Debt Sustainability for European Union Countries

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Abstract: This study investigates the determinants of public debt sustainability in the European Union (EU) countries, focusing on the combined effects of the COVID-19 pandemic and the Ukraine conflict. Utilizing the Generalized Method of Moments (GMM) for the 2000-2022 period to address the endogeneity and heterogeneity aspects, the research incorporates various factors, such as military and healthcare expenditures, private debt, and political stability to provide a comprehensive analysis of public debt dynamics. The findings revealed that lagged debt has a significant positive impact on current public debt, indicating its persistence over time. Economic downturns, military spending, and private debt are identified as key drivers of rising public debt, especially during periods of geopolitical tension and economic instability. Additionally, the study highlighted the roles of GDP per capita, inflation, and government expenditure in influencing fiscal stability. The research underscores the importance of adopting long-term fiscal discipline and counter-cyclical measures to manage public debt, particularly during crises. The study offers a comprehensive and original perspective upon the dynamics of EU countries' public debt and suggests that fiscal policies encouraging investments and supporting political stability contribute to the sustainable management of public debt.

Keywords: public debt sustainability; COVID-19 pandemic; Generalized Method of Moments; fiscal policy; European Union.

JEL classification: E61; E62; H63; F61.

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1. INTRODUCTION

The problem of public debt has once again emerged as a prominent subject of debate among academics, politicians, and journalists in the European Union (EU). In the last twenty years, the European Union has faced four significant crises that have had a tremendous effect on its economies. The subprime mortgage crisis of 2007–2008 sparked the failure of hedge funds, banks, and insurance firms, which in turn caused the global financial catastrophe. Mortgage-backed securities and credit default swaps drove the housing bubble. This bubble burst when the Federal Reserve increased interest rates, leading to a significant number of defaults and ultimately resulting in the 2008 financial crisis.

The implementation of the Euro, which brought together monetary policy but allowed individual states to control their fiscal policies, caused the sovereign debt crisis, which reached its peak between 2010 and 2012. This resulted in unregulated borrowing, especially in Greece and Portugal, worsened by the 2008 financial crisis. The Euro's incapacity to undergo additional devaluation exacerbated the crisis, leading to the implementation of several bailouts for economies in distress.

The COVID-19 pandemic reached its highest point between 2020 and 2022. Without a doubt, this health issue has posed a significant obstacle to a substantial recovery that followed the previous sovereign debt crisis (2009–2012). Significant public budget deficits and an unprecedented increase in public debt confront the EU economies, which have not fully recovered from the pandemic. These issues have arisen due to the mandatory two to three months of quarantine, social immobilization, border closures, reduced international trade, and high unemployment rates. Many developing nations have received financial aid and support from institutions like the World Bank and the International Monetary Fund, while the G20 countries have waived some portions of foreign loan payments for the poorest nations. However, European governments have had difficulties acquiring equivalent assistance. In the midst of policy disputes, the European Union has approved the establishment of a €100 billion fund, following a proposal from Spain and other nations. The primary objective of this fund is to offer monetary assistance for costs associated with employee layoffs and unemployment insurance, specifically targeting initiatives such as ERTE, which were enacted during the COVID-19 quarantine period. The ERTE program in Spain offers financial assistance to those who are temporarily out of work because of disruptions caused by the COVID-19 pandemic. The pandemic exacerbated problems by triggering a global economic recession and necessitating an unparalleled level of government expenditure to alleviate its socio-economic consequences, leading to a substantial rise in public debt levels among European Union member states. According to figures from the European Commission, the average ratio of public debt to GDP in EU member states was above 90% by the end of 2020, with notable differences between countries. Greece, Italy, and Portugal had the highest levels of debt, of over 100% of their Gross Domestic Product (GDP), while Estonia, Lithuania, and the Czech Republic had comparatively lower debt ratios, below 50% of their GDP. Particularly in countries disproportionately affected by the crisis, like Italy and Spain, the pandemic exacerbated the economic burden, leading to increased levels of debt.

And most recently the ongoing Ukraine crisis, which reached its climax in 2022 and continues to this day, presents significant financial issues that need massive investments to address the intricate socio-economic repercussions. The conflict in Ukraine also imposes a financial burden, with projected immediate fiscal costs for the European Union and its member

states totaling €175 billion, equivalent to between 1.1% and 1.4% of GDP in 2022. These costs encompass a wide range of operations, including efforts to stabilize domestic pricing, implementing policies for achieving energy independence, providing assistance to refugees, and adopting steps to enhance security and defense. Consequently, we anticipate a rise in borrowing, potentially leading to elevated levels of public debt throughout the European Union.

This research significantly enhances the current understanding of public debt's sustainability in EU nations by filling a critical void in the previous literature. Prior research has investigated several facets of public debt, but it has not extensively analyzed the collective influence of the COVID-19 epidemic and the Ukraine war. Furthermore, this study incorporates additional variables such as military expenditures, healthcare expenditures, private debt, and political stability into the analysis, providing a more comprehensive insight into the factors that affect the sustainability of public debt. The research aims to get a more comprehensive understanding of the intricate connections among economic, political, and external issues by utilizing the Generalized moment method (GMM). The main objective is to improve our understanding of the interplay between these components and their impact on financial results over a period, especially in relation to current geopolitical and macroeconomic occurrences.

This study used two main variables to characterize the Covid-19 pandemic and Ukraine conflict. For the health crisis, the variable of health expenditure into GDP was chosen, as this variable reflects the level of resources allocated to improving the healthcare system and responding to health crises such as the COVID-19 pandemic. As for military conflicts, they were measured using the Military Expenditure Index, which represents the financial burden associated with military preparations and operations related to conflicts. These two variables were chosen because they provide comprehensive and reliable data at the level of EU countries, and they directly reflect the impact of health crises and military conflicts on public financial resources. The use of the health expenditure ratio helps understand financial priorities during health crises, while military expenditure provides an indicator to measure the challenges associated with conflicts and their impact on public debt's sustainability. This choice aligns with previous literature that emphasized the importance of these indicators in analyzing the public debt in crisis contexts.

This study consists of six main sections. The first section presents the importance of studying the determinants of public debt sustainability in EU countries and the research objectives. The second section presents a literature review, where previous studies related to public debt sustainability and the factors affecting it are reviewed. The third section discusses the methodology used in the study, including the research design and analytical methods. Section four presents the empirical results derived from the statistical analysis. Section five addresses the discussion and challenges faced by the study, with a focus on interpreting the results and the limitations of the research. Finally, section six presents a conclusion that includes recommendations and proposed policies to enhance the sustainability of public debt in EU countries.

2. LITERATURE REVIEW

The determinants and dynamics of public debt have been a persistent focus in the academic literature, yet substantial gaps remain in understanding the multifaceted interactions influencing public debt sustainability across different regions and economic groupings. Thuan (2018) examined the role of macroeconomic variables in lower middle-income countries, employing the DGMM regression method with data from 40 nations covering the 1996-2015

period. While the study highlights the importance of trade openness, interest rates, and budget surplus in shaping public debt, it overlooks potential structural factors like governance and institutional quality, which may further explain the variation in debt sustainability across regions. Toth *et al.* (2022) expanded the focus to the European Union (EU), particularly in the aftermath of the COVID-19 pandemic, using panel data regression to identify key determinants of public debt from 1999 to 2019. Although their findings underline the debt-reducing effects of GDP growth and budget balances, the study does not fully address the dynamic role of fiscal rules and policy compliance among EU member states, especially those with high pre-existing debt burdens. Semik and Zimmermann (2022) offered a narrower geographical scope, focusing on Central and Eastern European EU countries. Their results emphasized the effectiveness of expenditure-based fiscal adjustments in reducing debt levels. However, the paper does not consider the potential trade-offs of such measures, such as the social costs of cuts in benefits and public sector wages, leaving room for further investigation into the long-term sustainability of these strategies. Chirwa and Odhiambo (2018) applied a panel ARDL approach to EU countries, demonstrating that economic growth reduces debt primarily in the short run, while long-term debt drivers include real interest rates and population growth. While comprehensive, their study's results raise questions about the differential impact of these factors during economic crises versus periods of stability, an area warranting further exploration. Aleme (2019) focused on external debt sustainability in Ethiopia, emphasizing the role of debt service ratios and real exchange rates. Although contextually rich, its applicability to other nations is limited due to Ethiopia's unique economic structure and debt composition, suggesting a need for more comparative analyses across developing economies. Sinha *et al.* (2011) analyzed panel data from 31 countries, including some European nations, for the 1993–2008 period. They found that GDP growth, government spending, education expenditure, and the current account balance significantly impact public debt in high- and middle-income countries. However, the study does not delve deeply into the varying regional dynamics that might influence these relationships. Dincă and Dincă (2015) studied the correlation between public debt and economic growth for 10 former communist countries from Central and Eastern Europe for the 1999-2010 period. They found that public debt can support countries' economic growth up to a limit of 50% of the GDP (weight of public debt into GDP) after which increased indebtedness can hinder that growth.

Other country-specific studies, such as those by Pirtea *et al.* (2013) and Dumitrescu (2014) in Romania, identified the primary fiscal balance, real interest rate, real GDP growth, and exchange rates as key factors affecting debt-to-GDP ratios. However, these studies lack a comparative perspective that could illuminate broader patterns across regions. Veiga and Veiga (2014) extended the scope by examining how debt impacts revenue and expenditure structures, identifying unemployment as a critical driver of debt. Although their findings are insightful, they leave unanswered questions about how labor market policies might mitigate such effects. In a broader analysis, Swamy (2015) used panel Granger causality tests to demonstrate that GDP growth, direct investments, government expenditures, and inflation negatively affect debt, while gross fixed capital formation and trade openness positively influence it. Similarly, Galiński (2015) explored public sector financial variables in Poland, emphasizing the cost of capital. These studies highlight macroeconomic influences but overlook institutional and governance factors, which Briceño and Perote (2020) argue are critical. Studies like those by Gargouri and Ksantini (2016) and Omrane Belguith and Omrane (2017) adopted regional and panel approaches, examining European countries and new EU

member states. Their findings underscored the role of nonperforming loans, military expenditures, imports, and balanced budgets in debt sustainability. However, the persistence of debt-to-GDP ratios over time raises questions about the structural factors that perpetuate debt cycles. Kudła (2018) introduced dynamic panel econometrics to analyze social and economic variables like unemployment and population growth, but the research lacks a focus on crisis-specific impacts. Recent studies have incorporated broader socio-political factors.

The theory of fiscal federalism is based on the idea that local governments' debts are closely linked to the internal organization of the state, which is defined through the financial relations between governments. Given the importance of local levels in financial federalism from both theoretical and practical perspectives, the research conducted by Moćević and Lazović-Pita (2024) aims to empirically investigate the factors that determine the debt of local units in the Federation of Bosnia and Herzegovina. Based on panel data from 2011 to 2019 and using the Generalized Method of Moments, the model is estimated using a set of financial, institutional, economic, and demographic variables. The results indicate that local units' debt is significantly determined by financial relationships between governments through a range of financial and institutional variables, in addition to demographic factors. However, the research does not adequately address the impact of major economic factors on these dynamics, indicating a research gap that can be explored in future studies. For example, studying the effects of global economic crises on these dynamics could be beneficial in expanding the understanding of the sustainability of local government debts. The study by Bokemeier and Stoian (2016) focuses on debt sustainability for 10 Central and Eastern European countries for the 1997-2013 period. Using a financial reaction function to determine stable debt in a balanced panel with fixed effects, the study compares stable debt with actual debt and historical returns to assess debt sustainability. While this study provides estimates of debt sustainability in Bulgaria and Romania, it is limited to specific countries and does not address the role of national and international fiscal policies in the impact of public debt on financial sustainability. This gap could be of interest in future studies that seek to examine the role of international financial institutions such as the International Monetary Fund in public debt's sustainability. Filip (2019) study addressed the factors affecting the level of public debt in 28 EU countries for the 1995-2017 period. The results indicate that public debt is significantly and positively affected by previously accumulated public debt, unemployment rate, and population size, while factors such as GDP growth and foreign direct investment flows help reduce public debt. However, the study does not prioritize analyzing the impact of economic crises such as the global financial crisis or the COVID-19 pandemic on public debt, which opens the door for subsequent studies that could focus on the impact of these crises on public debt in European countries. The study by Naveed and Islam (2024) explored the factors affecting the dynamics and sustainability of public debt in Pakistan between 1975 and 2021 using a debt dynamics approach and ARDL analysis. The study's results indicate a positive impact of fiscal deficits, currency depreciation, and interest rates on public debt. However, the study is limited to Pakistan only and does not take into account the impact of regional or global factors on public debt in similar countries, reflecting a gap that can be addressed in future research, which may include a comparison between other developing countries in South Asia. As for the study by Ye and Guo (2024), it addressed the sustainability of public debt in Sub-Saharan African countries. While the results indicate that public debt in these countries is unsustainable in the long term, the study does not address the potential impacts of global economic crises or changes in global markets on these dynamics. The study also does not

sufficiently clarify the relationship between monetary and fiscal government policies and their impact on debt sustainability. Kijjambu *et al*. (2023) investigate Uganda's debt sustainability determinants, using a public debt dynamics model that explores the relationship between public debt and macroeconomic factors, including GDP, primary balance, exchange rates, and interest rates. This study extends prior research by incorporating additional variables such as the production gap and non-interest current account balance. The findings suggest that fiscal surplus, low interest rates, and currency appreciation contribute positively to debt reduction and sustainability. However, the study finds that GDP growth does not significantly affect debt dynamics in Uganda, pointing to a potential gap in understanding the role of economic growth in debt sustainability. This underscores the need for future research to investigate other structural factors that may influence Uganda's debt dynamics, such as the informal economy or institutional capacity. Khan *et al*. (2021) examine the sustainability of public debt in South Asian Association for Regional Cooperation (SAARC) countries for the 1996-2017 period, using a panel ARDL model. They find that the saving-investment gap and economic growth negatively affect public debt, while budget deficits and current account balances positively contribute to debt levels. Their sustainability analysis indicates that public debt remains unsustainable for most years, highlighting the vulnerability of these economies to fiscal imbalances. While this study offers valuable insights, it overlooks potential long-term structural factors, such as demographic trends or political instability, that could contribute to the unsustainable debt trajectory in these countries. Future research could explore the role of such variables in debt sustainability. provide a detailed decomposition of public debt dynamics in Romania from 2000 to 2011, focusing on primary fiscal deficits, real interest rates, and GDP growth. Their analysis finds that fiscal policy, particularly the real interest rate, is a significant determinant of public debt. The study also reveals limited effectiveness of monetary policy as an automatic stabilizer. However, the authors do not consider the broader macroeconomic environment, such as the impact of external shocks or global market conditions, which could influence Romania's debt trajectory. This gap calls for further investigation into the interaction between domestic policies and global economic factors in shaping public debt. Saikouna and Matarr (2023) analyze the determinants of public debt in Gambia for the 2000-2019 period using the ARDL method. They identified trade openness and gross fixed capital formation as significant long-term drivers of public debt, while GDP growth and government effectiveness have the opposite effect. Interestingly, none of the variables show a significant relationship with public debt in the short run. This study highlights the importance of governance effectiveness in managing debt levels, which suggests that institutional reforms could play a critical role in debt sustainability. However, the study does not explore the role of international factors, such as foreign aid or external borrowing conditions, which could also impact Gambia's public debt. Manalo *et al*. (2022) explore the determinants of public debt in the Philippines, focusing on Foreign Direct Investment (FDI), gross capital formation, inflation, and trade balance. The study found that FDI negatively impacts public debt, while inflation and trade balance show insignificant effects. These findings suggest that FDI could be a viable strategy for reducing public debt, but the study neglects other important factors, such as the exchange rate or interest rates, which could influence debt accumulation. Future research could expand the model by including these variables to provide a more comprehensive understanding of debt dynamics in the Philippines. Omrane Belguith and Omrane (2017) investigate the macroeconomic determinants of Tunisia's public debt for the 1986-2015 period using the VECM model. The

study finds that inflation and investment reduce public debt, while real interest rates, budget deficits, and trade openness increase it. The budget deficit emerges as the most significant determinant of Tunisia's public debt. However, the study overlooks the impact of political factors or institutional quality on debt sustainability. A more nuanced approach could consider the role of governance and political stability in shaping fiscal outcomes. Waheed and Abbas (2021) analyze external debt sustainability in Islamic countries, differentiating between oil and gas exporters and importers. The study finds that economic growth and government revenue negatively affect external debt, while expenditure, inflation, and trade openness increase debt levels. This research, however, fails to consider the potential impact of oil price fluctuations on the fiscal balance, which is crucial for oil-exporting countries. Future studies could incorporate the role of global commodity markets in shaping external debt dynamics. Musah (2023) investigates the macroeconomic determinants of Ghana's public debt using the ARDL model. The study identifies merchandise trade, gross fixed capital formation, interest payments, and government spending as key drivers of public debt. While the findings underscore the importance of fiscal discipline, the study does not consider the role of external factors such as foreign aid or global financial market conditions. Incorporating these elements could provide a more comprehensive understanding of Ghana's debt dynamics. Khan (2021) addressed the accumulation of public debt in developing countries using a multi-regional analysis methodology for the period 2000-2015, covering Africa, Asia, Latin America, and the Caribbean. The study showed that regional determinants vary; in Africa, economic growth, corruption, and the quality of regulation were crucial factors, while in Asia, government spending and political stability played a central role. In Latin America, trade openness was the key. Despite the importance of the findings, the study lacked an analysis of economic crises' dynamics and their impact on these determinants, highlighting the need for deeper studies to clarify the interaction of political, economic, and social factors in shaping public debt. The study by Sadik-Zada and Gatto (2019) reviews the main factors affecting public debt growth in 184 countries, and shows that oil abundance, economic growth rate, share of mineral revenues in total revenues, and interest payments on external borrowing have a statistically significant impact on public debt growth. In contrast, defense spending, the unemployment rate, or the inflation rate did not have a statistically significant impact on public debt's rate. The study also showed that being a developing country has a statistically negative impact on the level of public debt. However, the study lacks an analysis of the impact of economic crises, political stability, or governance quality on shaping public debt, which limits its ability to provide a comprehensive view of public debt in various contexts. Additionally, the reliance on data from 2013 may limit the generalizability of the results across different time periods or to other countries with diverse economic and political conditions. The study by Ngasamiaku and Ngong'ho (2022) examines the macroeconomic determinants of Tanzania's public debt for the 1970-2019 period using the ARDL model. The results derived from the ARDL bounds test showed a long-term relationship among the macroeconomic determinants of public debt. The study also showed that in the short term, there is significant evidence that imports and government spending positively affect public debt, while the inflation rate negatively impacts public debt. Also foreign direct investments do not show any statistically significant effect on public debt. The study recommends that the Tanzanian government adopt prudent macroeconomic policies to reduce public debt, ensuring that resources are directed towards productive sectors to enhance local production, increase revenues, and improve export performance in the post-COVID-19 pandemic phase. This study

focused only on macroeconomic factors such as imports and government spending, without considering the political and social factors that may also affect the levels of public debt. Additionally, the use of a long time period (from 1970 to 2019) may expose the study to economic and political fluctuations that could affect the interpretation of the results. Furthermore, the study did not adequately address the impact of economic crises such as the COVID-19 pandemic on public debt directly. See Table no. 1.

Table no. 1 - Literature review

Study (Author/ Year)	Methodology	Regional Coverage	Main Results
Thuan (2018)	DGMM regression method	Lower-Middle Income Countries	The study results indicate that public debt in lower-middle-income countries is influenced by multiple macroeconomic factors, including trade openness, interest rates, budget surplus or deficit, inflation, economic growth, foreign direct investment, infrastructure, and the size of the financial system, highlighting the role of these factors in shaping the debt-to-GDP ratios during the period 1996-2015. However, it was found that the unemployment rate has no impact on public debt in these countries, indicating that labor market policies may not be effective in managing debt levels.
Chirwa and Odhiambo (2018)	A panel ARDL approach	Euro area	The study results indicate that economic growth reduces public debt in the short term, while factors such as the real exchange rate, investment, and population growth contribute to reducing debt in the long term. Conversely, the real interest rate is considered a factor that increases debt in both the short and long term, while government consumption leads to an increase in debt in the long term with a varying relationship in the short term.
Moćević and Lazović-Pita (2024)	Empirical analysis using panel data and generalized method of moments (GMM).	the Federation of Bosnia and Herzegovina	The study results indicate that the debt of local government units (LGUs) in the Federation of Bosnia and Herzegovina is significantly influenced by financial relations between governments, where a range of financial, institutional, and demographic variables play an important role. Funding the expenditure needs of certain local units, in addition to those located within cantons with special needs, is considered one of the main determinants of debt in both the short and long term. Transfers from other government levels also significantly affect the debt of local government units in both the short and long term.
Bokemeier and Stoian (2016)	Balanced panel with fixed effects	Ten Central and East European countries	The study results indicate that in 2017, public debt exceeded the stable debt ratio in all the countries examined. However, the public debt remains stable and below the tipping point. Moreover, it has been shown that governments are still far from the thresholds of "debt distress" that may indicate difficulties in financial sustainability.
	Survey and data analysis	28 European Union countries	The study results indicate that the debt-to-GDP ratio is significantly and positively affected by previously accumulated public debt, in addition to the impact of both unemployment and population size. Conversely, the growth of real GDP, foreign direct investment flows, gross capital formation, and the trade balance significantly impact the reduction of public debt.
Toth *et al.* (2022)	panel data regression model	European Union	The study results indicate that an increase in certain variables such as the current account balance, the budget balance, investments in public administration, the inflation rate, and GDP growth leads to a reduction in public debt in EU countries. On the other hand, an increase in variables such as the annual change in population density and budget costs leads to an increase in public debt. The study

Study (Author/ Year)	Methodology	Regional Coverage	Main Results
			results also showed that the impact of both the unemployment rate and purchasing power on public debt is not statistically significant.
Naveed and Islam (2024)	Debt dynamic approach and ARDL approach	Pakistan	The study results indicate that the fiscal deficit, currency depreciation, and interest rates have a significantly positive impact on public debt in Pakistan. The debt sustainability analysis also showed that public debt was unstable throughout the study period, except for a few years. The regression results confirmed the stability analysis findings, showing that the main forces increasing the debt burden in the country are poor financial discipline, high costs resulting from currency depreciation, and rising interest rates.
Ye and Guo (2024)	the theoretical model is known as the Present Value Budget Constraint (PVBC) model and the System-Generalized Method of Moments (System-GMM) method	Sub-Sahara African countries	Findings reveal that public debt in SSA countries is not sustainable in the long run, with factors such as the previous government debt, long-term debt ratio, debt repayment capacity, economic growth rate, inflation rate, export to GDP, and government fiscal deficit rate influencing sustainability. Additionally, the factors exhibit heterogeneity attributed to regional, natural resource, and income variations among SSA countries.
Kijjambu *et al.* (2023)	The Public Debt Dynamics Model	Uganda	The study results indicate that the fundamental balance, the real interest rate, and the real effective exchange rate have a significant positive impact on the public debt ratio, suggesting that a financial surplus, low interest rates, and currency appreciation are favorable factors for reducing public debt and ensuring its sustainability. It was also found that the debt ratio is negatively and significantly affected by the current account balance, indicating that a trade surplus is beneficial in managing debt. However, the study did not show a significant impact of economic growth on the dynamics of debt in Uganda. Based on that, the study recommends that policymakers focus on maintaining a financial surplus and prudent government financial management, taking measures to enhance revenues, control government expenditures, and reduce the fiscal deficit to achieve long-term debt sustainability.
Pirtea *et al.* (2013)	OLS regression to estimate the relationships between public debt and its determinants and the Newey-West procedure to correct for issues of heteroscedasticity and autocorrelation, ensuring more reliable results	Romania	The study results indicate that the ratio of public debt to GDP responded more significantly to the real growth rate of production after the financial crisis. The real interest rate on government bonds remained an important determinant of public debt throughout the study period. Additionally, it was found that monetary policy had limited effectiveness as an automatic stabilizer throughout the study period.
Saikouna and Matarr (2023)	An Autoregressive Redistributed Lag (ARDL) bound Cointegration Technique	Gambia	The study results show that trade openness and fixed capital formation have an increasing impact on public debt in the long term. On the other hand, GDP growth, the official exchange rate, and government effectiveness have a downward effect on public debt levels in the long term. However, none of the variables show a significant relationship with public debt levels in Gambia in the short term.

Study (Author/ Year)	Methodology	Regional Coverage	Main Results
Manalo *et al.* (2022)	Multiple Linear Regression	Philippines	The study results show that foreign direct investment (FDI) has a significant negative impact on public debt, where an increase of one unit in FDI leads to a decrease of 272.559 in public debt. The study also showed that the trade balance had a negative impact, but the result was similar to the inflation rate, which showed non-significant results. Based on these results, the researchers recommend focusing on other variables such as interest rates, exchange rates, and the debt-to-GDP ratio. The researchers concluded that FDI can be relied upon as a tool to reduce public debt, as an increase in the flow of foreign direct investments would be beneficial in alleviating the heavy reliance on debt.
Gargouri and Ksantini (2016)	Panel ARDL	12 Europeans countries	Identified macroeconomic variables influencing public debt across countries.
Omrane Belguith and Omrane (2017)	VECM model	Tunisia	The study results show that inflation and investment reduce the size of public debt in Tunisia, while the real interest rate, fiscal deficit, and trade openness increase public debt. The study also indicates that the fiscal deficit is the most influential factor on public debt in Tunisia.
Musah (2023)	ARDL method	Ghana	The study results show that there is a positive relationship between merchandise trade and public debt in Ghana, indicating that an increase in trade, due to the heavy reliance on foreign trade to meet local consumption needs, leads to an increase in public debt. The study also shows a positive relationship between fixed capital formation, economic growth, and public debt, where public debt increases with the rise in investment in fixed assets. Government interest payments also contribute to the accumulation of public debt. The study also indicates that government spending plays a crucial role in determining the trajectory of public debt, as increased spending leads to an increase in public debt. The results indicate that fiscal policies, external borrowing, trade, interest payments, and fiscal deficits significantly affect the levels of public debt in Ghana.
Waheed and Abbas (2021)	A Panel Data Analysis	Islamic Countries	The study results indicate that the factors affecting external debt in oil and gas-exporting Islamic countries include a negative impact from economic growth, central government revenues, foreign direct investment (FDI), and population size on external debt. While central government expenditures, trade openness, inflation, and current account deficits positively affect external debt. As for the Islamic countries that import oil and gas, economic growth, central government revenues, current account deficits, local investment, and the workforce negatively affect external debt, while foreign direct investment and foreign exchange reserves positively affect external debt. As for sustainability analysis, many oil and gas importing countries face a more precarious situation, where their actual debt exceeds the expected debt based on their macroeconomic performance, while oil and gas exporting countries remain in a better position regarding external debt, with some exceptions.

3. METHODOLOGY

Current research explores the determinants of public debt sustainability in the European Union countries. The GMM methodology is applied to establish public debt sustainability's

determinants for the 2000-2022 period and their effects, for all the EU-27 countries, respectively Belgium, Bulgaria, Czechia, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland and Sweden.

Table no. 2 below presents the variables used in the model, abbreviations, units, and data sources used to gain insight into the relation between public debt and economic growth.

Table no. 2 – Variables used in the econometric analysis

Variables Name	Abbreviation	Unit	Source
		Dependent variables	
Public debt	DEBT	% GDP	International Monetary Fund 2000-2022
		Independent variables	
GDP per capita	GDPP	% growth	International Monetary Fund 2000-2022
Foreign direct investment	FDI	% of GDP	World Bank 2000-2022
Inflation rate	INF	% increase of consumer prices	World Bank 2000-2022
Government expenditure	GE	%GDP	World Bank 2000-2022
Unemployment rate	U	% of total labor force	World Bank 2000-2022
Military expenditure	ME	% of GDP	World Bank 2000-2022
Healthcare expenditure	HE	% of GDP	World Bank 2000-2022
Privet debt	PD	% of GDP	International Monetary Fund 2000-2022
Political stability	PS	Standard Error	World Bank 2000-2022

Source: Adapted from Toth *et al.* (2022), Sinha *et al.* (2011), Omrane Belguith and Omrane (2017)

Empirical analysis uses the following model**:**

$$debt_{it} = \beta_0 + \beta_1\, debt\text{-}1_{it} + \beta_2\, gdpp_{it} + \beta_3\, fdi_{it} + \beta_4\, inf_{it} + \beta_5\, u_{it} + \beta_6\, milit_{it} + \beta_7\, health_{it} + \beta_8\, pd_{it} + \beta_9\, ps_{it} + \varepsilon_{it}$$

In the regression equation, Debt to GDP – is a proxy for *Public debt*. The subscripts *i* and t represent the number of nations and study periods, *i* = (1 to 27) and *t* = (2000 to 2022).

The variables examined in this research are crucial for comprehending the dynamics of public debt.

$Debt_{it-1}$, as defined by Pirtea *et al.* (2013) is the value of the debt variable from the preceding time period of (*t–1*). This variable is used to analyze the impact of previous debt levels on current levels, offering insights into the long-term patterns of debt persistence or adjustment. Furthermore, the regression analysis incorporates GDP per capita growth as a measure to assess economic growth's influence on public debt. According to Imran (2016), stronger economic growth results in more domestic revenue, which reduces the need to borrow money. Additionally, the inclusion of Foreign Direct Investment (FDI) is justified by its ability to improve productivity, as highlighted by Pirtea *et al.* (2013) ultimately resulting in a reduction in the debt-to-GDP ratio. Reinhart and Rogoff (2008) emphasize the importance of foreign direct investment (FDI) in elucidating the relationship between the debt-to-GDP ratio and the low- and middle-income nations. Furthermore, the inflation rate (Inf) is incorporated to quantify its impact on the dynamics of debt. According to Imran (2016), increasing inflation diminishes debt worth by counteracting interest rates' increase. In

addition, an increase in government spending or government expenditures (ge) can exceed government revenues, calling for borrowing and thus raising public debt, as explained by Uguru (2016). The inclusion of the unemployment rate (u) is based on the idea that governments may use public debt to tackle economic downturns during recessionary periods, as proposed by Sadik-Zada and Gatto (2019). Military expenditure (ME) had a negative relationship with public debt. Higher military spending, especially on arms imports, tends to lead to increased external borrowing and debt accumulation, particularly in developing countries. This negative impact occurs because military expenditures often create budget deficits that are covered by borrowing, thus contributing to the rise of public debt (Brzoska, 1983; Looney, 1991). Healthcare expenditure had a negative relationship with public debt (Said and Sani, 2020). Private debt (PD) had an interconnectedness between private and public debt, demonstrating that financial shocks and sovereign risk can intensify financial instability, resulting in increased public liabilities during economic downturns (Corsetti *et al.*, 2013; Andrés *et al.*, 2020). Political stability (PS) had no significant relationship between political stability and public debt (Briceño and Perote, 2020).

From a statistical perspective, Table no. 3 below lists the key descriptors of the variables employed in all the EU27 countries.

Table no. 3 – Descriptive statistics EU27 countries

Variables	Obs	Mean	Std.dev.	Min	Max
Debt	621	59.92	35.70	3.8	212.4
L.debt	621	3.88	0.7028	1.33	5.35
Gdpp	621	2.32	4.04	-14.46	23.3
Fdi	621	10.77	42.57	-391.4	449.0
Inf	621	2.88	3.67	-1.7	45.7
Ge	621	44.82	6.92	21.2	66.8
U	621	8.68	4.44	1.9	27.5
ME	621	1.42	0.5641	0.2251	3.86
He	621	8.08	1.83	4.20	12.82
Pd	614	148.2	78.17	10.74	406.8
Ps	594	0.2418	0.0342	0.1922	0.3962

Source: processed by the authors

The analysis of the data reveals substantial variability across several economic and financial indicators in Table no. 3. Public debt (DEBT) accounts for an average of 59.92% of GDP, accompanied by a significant standard deviation of 35.70%, underscoring considerable differences in debt levels among countries. The lagged debt ratio (L.DEBT) demonstrates an average of 3.88 with a standard deviation of 0.7028, indicating varying degrees of debt persistence over time. Economic performance, as represented by GDP growth rate (GDPP), shows a mean value of 2.32% and a high standard deviation of 4.04%, reflecting fluctuating economic conditions across the sample. Foreign direct investment (FDI) exhibits a mean of 10.77% of GDP, coupled with a substantial standard deviation of 42.57%, signaling notable variability in investment inflows and outflows. Inflation (INF) averages 2.88%, with a significant standard deviation of 3.67%, highlighting pronounced changes in price levels. Government expenditures (GE) represent 44.82% of GDP on average, with a standard deviation of 6.92%, indicating substantial public spending differences among countries. The labor market conditions, as captured by the unemployment rate (U), reveal an average of

8.68% and a standard deviation of 4.44%, pointing to varying employment dynamics. Military expenditures (ME) show a mean of 1.42% of GDP and a standard deviation of 0.5641%, reflecting moderate variability in defense spending. Health expenditure (HE) averages 8.08% of GDP with a standard deviation of 1.83%, demonstrating quite different investments in healthcare across countries. Private debt (PD) records an average of 148.2% of GDP, with a high standard deviation of 78.17%, signaling considerable differences in borrowing levels. Lastly, political stability (PS) shows an average value of 0.2418 with a standard deviation of 0.0342, indicating moderate stability with some regional variations.

4. EMPIRICAL RESULTS

The matrix in Table no. 4 shows the data correlations for all EU countries. It is observed that deferred debt (LDEBT) shows a strong positive correlation with current debt, indicating that previous debt levels significantly affect current debt. The per capita GDP (GDPP) also shows a negative correlation with public debt, reflecting that higher economic output is associated with a reduction in debt. Foreign Direct Investment (FDI) shows a weak positive correlation with debt, while inflation (INF) also shows a negative correlation, reflecting that high inflation is associated with a reduction in real debt. Government expenditure (GE) shows a moderate positive correlation, indicating that an increase in spending is associated with an increase in public debt. Unemployment (U) is also positively correlated with debt, highlighting that rising unemployment puts pressure on public finances. Military spending (ME) and healthcare spending (HE) show a positive correlation with public debt, indicating that increased spending in these areas contributes to higher levels of debt. Finally, political stability (PS) shows a negative correlation with public debt, indicating that lower political stability is associated with higher debt accumulation.

Current research employs four modeling approaches in its statistical analysis: Pooled OLS, Random effects model (REM), Fixed effects model (FEM), and Generalized moments of methods (GMM). These approaches are commonly used in related analyses of panel data Dawood *et al.* (2021), Ye and Guo (2024), and Ouhibi (2021). However, each model has its limitations, and thus the panel-corrected standard errors model (PCSE) was chosen for all 27 EU countries, considering its advantages in addressing potential issues of heteroscedasticity and autocorrelation in the data.

For all the 27 European countries the analysis started with Pooled OLS, using the data from 2000-2022. On the sampled data was used the Breusch-Pagan/ Cook-Weinsberg and White test, showed p-values of 0.8226, respectively 0.000. Therefore, the OLS model is suitable, but the data shows signs of heteroskedasticity. The multicollinearity test using the variance inflation factors averages all variables at 1.58 with no values above 5, therefore there is no multicollinearity within the dataset. The Breusch and Pagan Lagrangian test that assesses the random effects within the panel shows a *p-value* of 0.0000<0.05, which means that it is appropriate to use REM over OLS within the sample. The Hausman test was used on the data set in order to assess the better fit between REM and FEM. The *p-value* 0.0000< 0.05 concluded that FEM is a better fit. The data was tested using the Breusch-Pagan LM test of independence for cross-sectional dependence and it resulted in a *p-value* of 0.0000<0.05. The Wooldridge and Wald tests both revealed a *p-value* of 0.0000<0.05, therefore the panel data displays signs of heteroskedasticity, autocorrelation, and cross-dependence. Ramsey RESET test for robustness shows a value of 0.0000<0.05. To correct the previous issues, the panel-

corrected standard errors (PCSE) were used due to having the number of observations higher compared to the period of time. Afterwards, the GMM model was used. Table no. 5 illustrates the analysis of pooled OLS models, random effects models (REM), fixed effects models (FEM), panel-corrected standard errors (PCSE), and geometric models. (GMM). Through the Pooled OLS model for all European countries, it was found that deferred debt (L.DEBT) has a significant positive impact on the current public debt, reflecting the continuity of high debt levels from previous periods. In periods of financial crises, such as the global financial crisis and the Eurozone crisis, the unemployment rate (U) significantly affects public debt, as rising unemployment leads to increased government spending on social benefits and a shrinking tax revenue base. Military spending (ME) also has a significant impact, as an increase in defense spending contributes to raising public debt, especially during geopolitical crises such as the Ukraine crisis. Private debt (PD) also has a strong positive impact on public debt, indicating that increased borrowing from the private sector can put pressure on public finances, especially during periods of economic recession. Finally, political stability (PS) affects public debt, as low stability exacerbates the fiscal deficit, especially during times of crisis, leading to a higher accumulation of debt. In the REM model, deferred debt (L.DEBT) plays an important role, reflecting how previous debt levels affect the current debt. During crises such as the global financial crisis and the Eurozone debt crisis, public debt increased significantly due to increased government spending and reduced public revenues. Economic growth affects the per capita GDP (GDPP), which in turn affects the public debt. The inflation rate (INF) also affects the debt through its impact on the real values of the debt and economic stability, which was particularly volatile during the pandemic. Government expenditure (GE) is also a key factor; excessive government spending during crises such as the COVID-19 pandemic and the Ukraine crisis has led to increased levels of debt. The impact of the unemployment rate (U) on public debt was significant, as the rise in unemployment during crises led to increased government spending on social benefits. Spending on healthcare (HE) increased, especially during the COVID-19 pandemic, contributing to the rise in public debt. Private debt (PD) also has a significant impact on public debt. In the FEM model, lagged debt (L.DEBT), per capita GDP (GDPP), inflation rate (INF), government expenditure (GE), unemployment rate (U), healthcare expenditure (HE), private debt (PD), and political stability (PS) are included as factors affecting public debt. (DEBT). In the GMM model, it is shown that lagged debt (L.DEBT) remains a crucial factor, illustrating how previous debt levels continue to affect the current public debt. Economic fluctuations during crises such as the global financial crisis and the Eurozone debt crisis affect GDP per capita (GDPP), which in turn impacts public debt through its effect on government revenues. Foreign direct investment (FDI) also affects public debt, as changes in investment flows can impact economic stability and public finances, especially during periods of global turmoil. Government expenditure (GE) is a key variable, as the increase in spending during the COVID-19 pandemic and the Ukraine crisis has led to higher levels of public debt. The unemployment rate (U) significantly affects public debt, as periods of recession and crises lead to increased unemployment and higher government spending on social benefits. Military spending (ME) also plays a role in increasing public debt, especially during geopolitical conflicts such as the Ukraine crisis. Finally, political stability (PS) affects public debt, as low political stability exacerbates the financial deficit, especially during crises such as the Eurozone debt crisis and the Ukraine crisis, leading to a higher accumulation of debt.

Table no. 4 – Correlation matrix EU27

	(1) Debt	(2) L.debt	(3) Gdpp	(4) Fdi	(5) Inf	(6) Ge	(7) U	(8) Milit	(9) Health	(10) Pd	(11) ps
(1)	1.0000										
(2)	0.8965***	1.0000									
(3)	-0.2549***	-0.2662***	1.0000								
(4)	0.0183*	0.0393*	-0.0002*	1.0000							
(5)	-0.2198***	-0.2222***	0.1923***	-0.0578*	1.0000						
(6)	0.5100***	0.5339***	-0.4434***	-0.1042**	-0.2185***	1.0000					
(7)	0.3203***	0.2177***	-0.0663**	-0.0272*	-0.1249***	0.0738**	1.0000				
(8)	0.2115***	0.1142***	0.0338*	-0.1035***	0.2301***	0.1070***	0.3027***	1.0000			
(9)	0.4840***	0.5456***	-0.3413***	-0.0475*	-0.2565***	0.6745***	-0.1247***	-0.1268***	1.0000		
(10)	0.1189***	0.1238***	-0.2810***	0.1707***	-0.2776***	0.1829***	-0.1665***	-0.3810***	0.3336***	1.0000	
(11)	-0.2494***	-0.2439***	0.1625***	0.0640*	0.2824***	-0.0939**	0.0120*	0.1287***	-0.2517***	-0.1846***	1.0000

Note: *, ** and *** denote significance at 1%, 5% and 10% respectively

Source: processed by the authors

Table no. 5 – P-values showing the statistical significance of considered variables

	Dependent variable GDPP				
Independent Var	**Pooled OLS**	**REM**	**FEM**	**PCSE**	**GMM**
l.debt	41.7594***	36.3463***	35.8408***	35.1954***	46.8747***
	(1.1585)	(1.3992)	(1.4659)	(1.7329)	(6.0817)
Gdpp	0.1295*	0.4343***	0.4381***	0.0099*	-0.3326***
	(0.1702)	(0.1034)	(0.1037)	(0.0456)	(0.0959)
Fdi	-0.0028*	0.0038*	0.0035*	-0.0069*	0.0209***
	(0.0144)	(0.0089)	(0.0089)	(0.0043)	(0.0213)
Inf	0.0079*	0.2800***	0.3080***	0.0073*	-0.2434*
	(0.2094)	(0.1309)	(0.1315)	(0.0832)	(0.0873)
Ge	0.1415*	0.5525***	0.6011***	0.2269***	0.7052***
	(0.1350)	(0.1444)	(0.1481)	(00934)	(0.2812)
U	1.0043***	1.0702***	1.0768***	0.3363***	-1.1382***
	(0.1566)	(0.1269)	(0.1309)	(0.1635)	(0.2492)
Me	8.0148***	-0.0432*	-0.5995*	2.4733**	-13.6094***
	(1.2944)	(1.5756)	(1.6551)	(1.3042)	(3.9086)
He	0.3290*	1.3526***	1.3311***	0.7669**	-0.9088*
	(0.5210)	(0.5529)	(0.5724)	(0.4488)	(0.9837)
Pd	0.0305***	-0404***	-0.0512***	0.0240***	0.0287*
	(0.0092)	(0.0146)	(0.0159)	(0.0120)	(0.0317)
Ps	-55.0093***	-90.3168***	-97.5238***	-21.7506***	43.7578***
	(19.5346)	(16.8614)	(18.1381)	(12.9227)	(17.6816)
_cons	-122.93	-100.10	-96.13	-98.29	-153.16
	(7.1469)	(9.08)	(9.40)	(7.75)	(18.70)
Obs	587	587	587	587	560
F-statistic	297.88	1877.85	176.31	901.44	42122.70
Prob	0.0000	0.0000	0.0000	0.0000	0.000
R^2	0.8380	0.8078	0.8000	0.7716	
Sargan test					0.809
Hansen test					0.435

Note: *, ** and *** denote significance at 1%, 5% and 10% respectively

Source: processed by the authors

5. DISCUSSION AND LIMITATIONS

The empirical findings of our study offer useful insights into the variables and patterns that impact public debt in European Union (EU) nations, especially in light of the continuing challenges related to post-pandemic recovery efforts and the Ukraine war. Current research showed that lagged debt (L.DEBT) has a significant positive effect on current public debt, reflecting the persistence of high debt levels from previous periods, which aligns with the findings of Naveed and Islam (2024). Our results also support Omrane Belguith and Omrane (2017) regarding the notable effects of factors such as inflation and investment on changes in public debt, which are crucial under increasing inflationary pressures and unpredictable investment conditions. Furthermore, current findings highlight the significant impact of government spending on public debt trajectory, as noted by Musah (2023), underscoring the importance of fiscal policies in supporting economic recovery while addressing debt sustainability issues. Our results also align with Manalo *et al.* (2022) concerning the negative relationship between foreign direct investment (FDI) and debt levels, which is significant in the context of current efforts to attract investments amidst global instability. However, the divergence of our results from those of Kijjambu *et al.* (2023) regarding the effect of GDP growth on debt dynamics underscores the need for a thorough examination of economic recovery plans amidst ongoing post-pandemic uncertainty. Additionally, the complexities between inflation rates, GDP growth, and debt levels, as emphasized by Toth *et al.* (2022), suggest the need for flexible policy frameworks to address changing economic conditions. Ngasamiaku and Ngong'ho (2022) provides unique insights into the integration of macroeconomic factors affecting public debt, highlighting the complex nature of debt accumulation and offering valuable recommendations for policymakers aiming for fiscal sustainability in uncertain economic conditions. Pirtea *et al.* (2013) noted the increased endurance of debt-to-GDP ratios following the 2007 global financial crisis, emphasizing the importance of enhancing fiscal resilience in response to economic shocks. Dawood *et al.* (2021) highlighted the importance of economic growth and investment in reducing external debt, providing significant perspectives on managing debt in the current economic environment. On the other hand, Toth *et al.* (2022) emphasized the negative impact of real GDP growth, foreign direct investment, government spending, and inflation on debt levels, highlighting the complexity of managing public debt amidst diverse economic conditions. Vale (2022)examined the relationship between unemployment and public debt, while Khan (2021) revealed regional disparities as another factor affecting public debt, advocating for tailored policy interventions to address different economic contexts. Khan *et al.* (2021) also noted that in Africa, GDP growth and gross capital formation influence public debt, while in Asia, government spending affects public debt, whilst in Latin America and the Caribbean, trade openness determines public debt. Furthermore, Chirwa and Odhiambo (2018) emphasized the immediate benefits of economic growth in reducing debt and the long-term benefits of investment. These insights can assist policymakers in making informed decisions on financial planning and prioritizing investments. Kudła (2018) identified unemployment and foreign direct investment (FDI) as critical determinants of public debt, suggesting that specific interventions are needed to effectively address debt sustainability. Thuan (2018) highlighted the importance of macroeconomic factors in influencing public debt patterns in lower and middle-income countries, offering valuable insights for policymakers in similar economic situations. Finally, Semik and Zimmermann (2022) provided valuable insights into the relationship between economic growth rates and the

reduction of government debt, supporting policymakers in achieving fiscal sustainability amid changing economic conditions.

The current study presents several new variables that have not been extensively explored in previous research. While current analyses have shown that military expenditures (ME) significantly affect public debt, especially in the context of geopolitical crises such as the conflict in Ukraine, this finding indicates the need for further research to understand the broader impacts of defense spending on public finances. Similarly, the significant impact of health expenditures (HE) on public debt, especially during the COVID-19 pandemic, highlights the importance of exploring how increases in health spending contribute to the rise in public debt. The strong positive impact of private debt (PD) on public debt indicates that borrowing in the private sector can put pressure on public finances, especially during periods of economic downturns and financial crises, necessitating a deeper study of the interactions between private and public debts. Moreover, the study results show that political stability (PS) significantly affects public debt, as a decline in stability exacerbates financial imbalances and contributes to the accumulation of public debt, especially during crises such as the conflict in Ukraine and the Eurozone debt crisis.

On the other hand, this study faces some limitations that may affect the interpretation of the results. The study relies on annual data, which may limit our ability to capture rapid changes in public debt and the factors affecting it in the short term. Additionally, the study is limited to analyzing the main economic and political factors without extensively addressing the social and cultural factors that may influence public debt. In the future, the research can be expanded to include quarterly data or individual-level data, as well as examining the impact of social factors such as education and innovation on the sustainability of public debt.

6. CONCLUSION AND POLICY IMPLICATION

This empirical study offers useful insights into the factors and actions that influence public debt in European Union (EU) nations. It presents both confirming evidence and discoveries in comparison to previous research, and it emphasizes that lagged debt (L.DEBT) had a significant positive effect on current public debt, indicating the persistence of debt levels over time. Economic downturns, such as the global financial crisis and the Eurozone crisis, led to increased unemployment (U), which in turn pressured public finances through higher social spending and lower tax revenues. Military expenditure (ME) was also a key driver of rising public debt, particularly during geopolitical tensions, such as the Ukraine conflict. Furthermore, private debt (PD) strained public finances, leading to higher public debt, particularly during periods of economic instability. The study also highlighted the impacts of GDP per capita (GDPP) and inflation rate (INF) on public debt, showing that economic fluctuations and inflation volatility influenced fiscal stability. Government expenditure (GE), particularly during crises such as the COVID-19 pandemic, significantly contributed to debt accumulation. Healthcare expenditure (HE) similarly grew, reflecting the financial burden of managing public health crises. Political stability (PS) was crucial, as reduced stability exacerbated fiscal imbalances, leading to increased debt accumulation during crises. Finally, foreign direct investment (FDI) played a role in public debt dynamics, where shifts in investment flows affected economic stability and government finances, particularly during global disruptions.

The results of this study indicate the necessity of adopting comprehensive financial policies in EU countries to address the multiple factors affecting public debt. It is recommended to enhance long-term financial sustainability by reducing accumulated debt, decrease the fiscal deficit and improve public spending's efficiency. Counter-cyclical measures should be implemented, such as strengthening social safety nets and increasing tax revenues, to mitigate the impact of recession on public finances. It is also essential to carefully manage defense spending to avoid placing an additional burden on public finances during periods of geopolitical tensions and to regulate private borrowing to reduce pressure on public debt during financial crises. Policies that stimulate economic growth should be adopted, such as enhancing per capita GDP and controlling inflation to ensure financial stability, with the necessity of monitoring government spending during crises like the COVID-19 pandemic to avoid debt accumulation. Finally, it is recommended to enhance political stability and attract foreign direct investments to help strengthen economic stability and reduce the impact of global disruptions on public debt.

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