THE IMPACT OF PUBLIC DEBT AND MACROECONOMIC DETERMINANTS ON ECONOMIC GROWTH IN DEVELOPING ECONOMIES

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Abstract: This study examines the impact of public debt and key macroeconomic determinants on the economic growth of developing economies, measuring economic stability through annual GDP growth. The econometric model includes seven independent variables: public debt, trade openness, government expenditures, foreign direct investment, inflation, gross capital formation, and population growth. The analysis relies on secondary data from 20 countries over the period 2009–2023, processed using SPSS and Excel. The results indicate that government expenditures negatively affect economic growth, highlighting the need for fiscal discipline and careful management of public debt. In contrast, investments in gross capital formation and population growth have a favorable, sustainable effect on long-term economic growth. Public debt, trade openness, FDI, and inflation have varying impacts across countries, depending on each country's specific structure.
The study provides practical guidance for policymakers, emphasizing the importance of balanced fiscal management, the promotion of productive investments, and policies that support sustainable population growth. The findings contribute to the literature on economic development and public debt, offering an empirical framework for effective decision-making in developing economies.
Keywords: Public debt, stability, budget deficit, fiscal policy.

1. INTRODUCTION

This section summarizes the theoretical and institutional foundations of the impact of public debt on the economy, beginning with the 19th-century contributions of David Ricardo. Ricardo formulated the Ricardian Equivalence Theorem, which holds that current budget deficits necessitate higher taxes in the future. When the government reduces taxes without changing public spending, rational households understand that the future tax burden remains unchanged. As a result, they reduce current consumption and increase savings to prepare for this future burden. The theory is based on the government's intertemporal budget constraint and the permanent income hypothesis, emphasizing that consumers base their decisions on long-term expectations rather than temporary fluctuations in income (Alfred & Bettina, 2015).
From a policy perspective, financial stability has become a central objective for European countries. The European Treaty assigns the European Central Bank the task of supporting policies for the careful supervision of credit institutions and maintaining the stability of the financial system, as stated in Article 127(2) of the Treaty on the Functioning of the EU. However, policy formulation in this area remains challenging due to inherent difficulties in defining, measuring, and forecasting financial stability (Schinasi, 2004).
To address these challenges, the European Union has undertaken deep institutional reforms, the most important of which is the creation of the Banking Union. This mechanism aims to strengthen supervision and enhance the financial system's resilience. Financial integration and relatively homogeneous regulations within the EU provide a suitable environment for analyzing the link between financial stability and economic performance, enabling a more coordinated and practical approach to risk management (Jerome, Paul, & Fabien, 2014).

2. LITERATURE REVIEW

The literature review on public debt and economic stability highlights that debt management is critical for the functioning of economies, especially developing ones. Alessandro (2023) emphasizes that the choice of currency, indexing, and maturity structure of public debt affects financial markets, risk allocation, policy credibility, and tax burdens. Empirical studies on the relationship between public debt and long-term growth, however, are mixed: Panizza and Prezbitero (2013) note that while some findings indicate a negative correlation between debt and economic growth, there exist thresholds and non-monotonic relationships that make this link unstable, highlighting the need for further analysis that accounts for heterogeneity across countries. Debt sustainability is typically assessed by comparing outstanding debt stocks with projected primary fiscal surpluses, taking into account all revenues, current expenditures, transfers, and entitlement payments (Ersamo, Mendoza, & Zhang, 2016).
Regarding economic growth, the early consensus in the 1990s was that central banks should act mainly through interest rates to control inflation, following the Taylor rule (1993). The Global Financial Crisis (2007–2009) and the COVID-19 pandemic challenged this approach, prompting the use of alternative monetary policies such as quantitative easing and forward guidance (Smets, 2014; Tobal & Menna, 2020). Before the crisis, financial stability

was viewed mainly at the micro level, ignoring systemic risks that became evident during the crisis (Acharya, 2013). Negative externalities and interconnections among financial institutions demonstrated the importance of systemic monitoring and public intervention to maintain stability (Tobal & Menna, 2020).

In developing economies, public debt is an important tool for financing development and infrastructure projects, but its mismanagement can pose risks to economic growth (Ray, 2009). Ocampo and Rob (2008) note that globalization has had mixed effects on economic growth; integration into international markets has facilitated higher public debt but also increased vulnerability to global crises.

Historically, public debt theories provide a conceptual framework for understanding the challenges faced by developing economies. Ricardo's classical theory emphasizes Ricardian equivalence, arguing that budget deficits necessitate higher future taxes, reducing consumption and savings (Ricardo, 1817). In contrast, Keynes (1936) argues that public debt can be used to stimulate aggregate demand and stabilize the economy during recessions. In developing economies, public debt is often associated with fiscal crises and economic instability, as observed during the Latin American debt crises of the 1980s (Stiglitz, 2002). In a financially integrated world, globalization has increased borrowing opportunities but also exposure to international volatility risks (Eichengreen, Hausman, & Panizza, 2003). Debates over public debt thresholds and their impact on growth have prompted analyses suggesting that debt may hinder long-term growth beyond certain thresholds (Reinhart & Rogoff, 2010).

Recent research gives us a clearer picture of how public debt and other economic factors affect growth in developing countries. Musa et al. (2023) use a quantile-via-moments method with data from 44 developing countries (1990–2000). They find that public debt usually slows growth, but good governance can reduce this negative effect. In fact, better government quality can help debt have a more positive impact in countries with medium to high growth. Similarly, Setiastuti (2025) uses quantile regression on 127 developing economies (2012–2019) and finds that higher public debt limits growth, especially in countries already growing quickly. However, trade openness and foreign direct investment help drive growth. Fan, Lederman, Nguyen, and Rojas (2023) look at how events like natural disasters and debt distress change the relationship between debt and growth. They show that these shocks sharply lower growth and lead to more debt in countries with fewer resources. Finally, Adebayo, Maku, and Odusanya (2023), in their study of 12 African countries (1991–2020), use a panel smooth transition regression and find a nonlinear relationship. Growth peaks when debt is about 60.5% of GDP, but if debt rises above this level, the benefits start to disappear. Together, these studies show that the link between debt and growth in developing countries depends a lot on governance, exposure to crises, openness to trade, and how much debt a country has.

This review demonstrates that effective debt management and sustainable fiscal policies are essential for economic stability, particularly in developing economies, where exposure to global fluctuations and the need to finance development projects are more pronounced.

3. METHODOLOGY

This study evaluates the impact of macroeconomic variables such as public debt, trade openness, government expenditures, foreign direct investment, inflation, gross capital formation, and population growth on economic growth, measured by GDP growth. The analysis relies on secondary data sourced from the World Bank and IMF, covering 20 economies for the period 2009–2023. The methodology employs an econometric model at the 5% significance level. At the same time, statistical analysis is conducted in MS Excel and SPSS, including regression analysis, correlation, and tests for heteroskedasticity, multicollinearity, and autocorrelation. The objective is to identify the real effect of each variable, structure the research question, and formulate evidence-based hypotheses, enabling reliable conclusions and policy recommendations.

The model includes one dependent variable, the annual GDP growth as an indicator of economic growth, and seven independent variables capturing key fiscal, trade, investment, monetary, and demographic dimensions. Data are drawn from official World Bank and IMF statistics for 2009–2023.

Dependent Variable (Y):

- **GDP Growth (% annual):** Reflects the economy's elasticity and capacity to sustain growth while withstanding shocks.

Independent Variables (X1–X7):

- **Public Debt (% of GDP):** Indicates fiscal sustainability and the debt burden relative to national output.
- **Trade Openness (% of GDP):** Measures the level of integration with global trade.
- **Government Expenditures (% of GDP):** Reflects the role and scope of the public sector in the economy.
- **Foreign Direct Investment (% of GDP):** Signals the economy's attractiveness for external capital.
- **Inflation (% annual):** Represents price stability and purchasing power.
- **Gross Capital Formation (% of GDP):** Reflects investments in productive assets and long-term capacity.

- **Population Growth (% annual):** Captures changes in labor supply and aggregate demand.

Econometric Model:

GDP Growth = $\beta_0 + \beta_1$ (Public Debt) + β_2 (Trade Openness) + β_3 (Government Expenditures) + β_4(FDI) + β_5(Inflation) + β_6 (Gross Capital Formation) + β_7 (Population Growth) + ε

Research Questions and Hypotheses:

- How does public debt affect the economic growth of developing economies?
- What are the key determinants shaping economic growth in these economies?

Hypotheses:

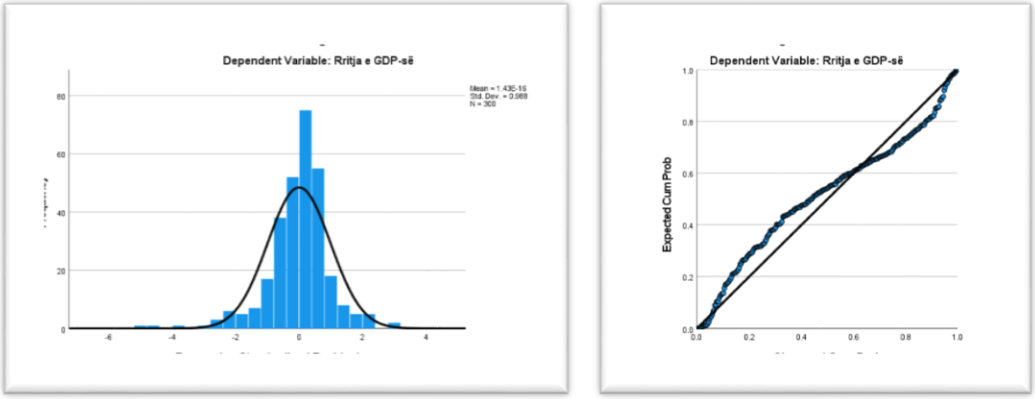
- **H_0:** The variables included in the study do not affect economic growth.
- **H_1–H_7:** Factors such as public debt, trade openness, government expenditures, FDI, inflation, gross capital formation, and population growth significantly influence the economic development of developing economies.

4. EMPIRICAL DATA AND STUDY FINDINGS

This section presents all study results and the hypothesis testing performed using statistical tests for the variables included in the econometric models.

From the histogram, we observe that the data are approximately normally distributed (symmetric), as the histogram curve is mesokurtic rather than straight. The probability plot indicates a linear relationship between the dependent variable and the independent variables, as the points are closely aligned with the regression line, with some deviations that correspond to the error term.

Graph 1. Graphical Representation of Histogram and Probability Plot



Source: Authors' calculations in SPSS (2025)

Interpretation of Variable Coefficients, Correlation, and Determination

Table 2. Variable Coefficients and Significance Levels

Variable	Coefficient	Significance
β_0 (Constant)	2.822	0.077
β_1 (Public Debt)	-0.006	0.607
β_2 (Trade Openness)	0.006	0.487
β_3 (Government Expenditure)	-0.075	0.000
β_4 (FDI)	-0.116	0.126
β_5 (Inflation)	-0.360	0.186
β_6 (Gross Capital Formation)	0.093	0.019
β_7 (Population Growth)	1.142	0.000

Source: Authors' calculations in SPSS (2025)

Table 3. Summary of Econometric Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	**.475[a]**	**.225**	**.207**	**4.05812**	**2.150**

a. Predictors: (Constant), Population Growth, Public Debt, FDI, Inflation, Gross Capital Formation, Government Expenditure, Trade
b. Dependent Variable: GDP Growth

Source: Authors' calculations in SPSS (2025)

Error Term:

$\varepsilon = 100\% - R^2 = 100\% - 22.5\% = 77.5\% = 0.775$

Econometric Model:

$$Y = 2.822 - 0.006X_1 + 0.006X_2 - 0.075X_3 - 0.116X_4 - 0.036X_5 + 0.093X_6 + 1.142KX_7 + 0.775$$

The econometric analysis shows that some variables, including Public Debt (X_1), Trade Openness (X_2), FDI (X_4), Inflation (X_5), and the constant (β_0), are not statistically significant for economic growth (P-Value > 0.05). Conversely, Government Expenditure (β_3) has an adverse effect: a one-unit increase reduces economic growth by 0.075 units (P-Value = 0.000), reflecting inefficiency or the impact of rising public debt. Gross Capital Formation (β_6) has a positive effect: a one-unit increase raises stability by 0.093 units (P-Value = 0.019), highlighting the importance of investment in infrastructure and industry. Population Growth (β_7) has the most substantial impact: a one-unit increase raises economic growth by 1.142 units (P-Value = 0.000), through expanding the labor force and increasing aggregate demand.
The correlation coefficient (R = 0.475) indicates a weak-to-moderate positive relationship between economic growth and the independent variables. In contrast, the coefficient of determination (R^2 = 0.225) shows that the model explains only about 22.5% of the variation in economic growth. T- and F-tests confirm the significance of some coefficients and the overall statistical validity of the model, thereby helping identify the most influential factors in economic growth.

Critical T-Value:

$Tkr = t_L/2; n-k$
$= 0.05:2, 300-7$
$= 0.025, 293$
$= 1.960$

If $Tkr < Tf$, H_0 is rejected, H_1 accepted
If $Tkr > Tf$, H_0 is accepted, H_1 rejected

Table 4. Comparison of Tkr and Tf Values

Variable	T-Statistic	Hypothesis Accepted
$TfX_1 = -0.515$	< 1.995	H_0
$TfX_2 = 0.696$	< 1.995	H_0
$TfX_3 = -3.374$	> 1.995	H_3
$TfX_4 = -1.533$	< 1.995	H_0
$TfX_5 = -1.324$	< 1.995	H_0
$TfX_6 = 2.354$	> 1.995	H_6
$TfX_7 = 5.236$	> 1.995	H_7

Source: Authors' calculations in SPSS (2025)

Critical F-Value:

$Fkr = FL(k-1)\ (n-1)$
$= 0.05(7-1)\ (300-1)$
$= 0.05(6,299) = 2.0986$

If $Fkr < Ff$, H_0 is rejected, H_1 accepted
If $Fkr > Ff$, H_0 accepted, H_1 rejected

Table 5. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1399.427	7	199.918	12.140	.000[b]
	Residual	4808.756	292	16.468		
	Total	6208.182	299			

a. Dependent Variable: GDP Growth
b. Predictors: (Constant), Population Growth, Public Debt, FDI, Inflation, Gross Capital Formation, Government Expenditure, Trade

Source: Authors' calculations in SPSS (2025)

Since Fkr (2.0986) < Ff (12.140), the alternative hypothesis is accepted and the model is statistically significant (P-Value = 0.000 < 0.05).

Interpretation of Results:

- The model is overall statistically valid according to the F-Test.
- T-Tests confirm that Government Expenditure, Gross Capital Formation, and Population Growth significantly influence economic growth.

Multicollinearity Test (VIF Values):

Table 6. Multicollinearity Test (VIF Values)

VIF	Issue
$VIFX_1 = 1.158$	Not serious
$VIFX_2 = 1.652$	Not serious
$VIFX_3 = 1.413$	Not serious
$VIFX_4 = 1.294$	Not serious
$VIFX_5 = 1.089$	Not serious
$VIFX_6 = 1.514$	Not serious
$VIFX_7 = 1.476$	Not serious

Source: Authors' calculations in SPSS (2025)

The VIF values indicate only a minimal presence of multicollinearity.

Autocorrelation Test (Durbin-Watson):

As previously shown in Table 3, the Durbin-Watson coefficient = 2.150, indicating no presence of autocorrelation in this econometric model for the 2009–2023 time series.

5. CONCLUSIONS AND RECOMMANDATIONS

The econometric analysis shows that government expenditure, gross capital formation, and population growth are key factors influencing economic stability in developing economies. Excessive government spending has adverse effects, increasing public debt and reducing the efficiency of resource allocation. In contrast, investments in gross capital formation positively contribute to productivity growth, expansion of productive capacities, and long-term economic stability. Population growth is viewed as an asset, expanding the labor force, increasing aggregate demand, and stimulating economic activity, provided that effective policies for employment, education, and healthcare are in place.

Based on these findings, the following recommendations are made:

Careful management of government expenditure, prioritizing critical sectors such as education, healthcare, and infrastructure.

Promotion of gross capital formation through a favorable investment environment, fiscal incentives, and public-private partnerships.

Leveraging population growth for economic stability by investing in education, vocational training, job creation, and improved healthcare services.

These measures help ensure sustainable economic growth, increase productivity, and maintain macroeconomic stability in developing economies, maximizing the benefits of the country's resources and demographic potential.

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