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Public Debt Sustainability and Economic Growth: A Cross-Country Assessment

Aneela Noreen

Department of Business Administration, Fatima Jinnah Women University

Email: aneela.noreen@fjwu.edu.pk

Imran Siddiqui

Department of Economics, Lahore University of Management Sciences (LUMS), Pakistan

Email: imran.siddiqui@lums.edu.pk

Abstract:
This study examines the relationship between public debt sustainability and economic growth across 40 countries, encompassing both emerging and developed economies over the period 2000–2023. Using panel data and dynamic panel estimation techniques, the study evaluates how debt-to-GDP ratios, fiscal deficits, and interest payments impact long-term economic growth. The results indicate that moderate debt levels support economic growth by financing productive investment, while excessive debt burdens hinder growth and exacerbate macroeconomic vulnerabilities. Country-specific institutional quality, fiscal discipline, and debt management policies significantly moderate these effects. The study provides insights for policymakers to design sustainable debt strategies that balance fiscal needs with long-term growth objectives.

Keywords: *Public Debt, Debt Sustainability, Economic Growth, Fiscal Policy*

1. INTRODUCTION

Public debt plays a central role in economic development, serving as a tool for financing government expenditure, investment, and social programs. However, excessive debt can lead to macroeconomic instability, higher interest obligations, and reduced fiscal space for growth-enhancing policies. The sustainability of public debt is closely linked to economic growth; an unsustainable debt trajectory can trigger crises, while prudent debt management can promote long-term prosperity.

This study assesses public debt sustainability and its effect on economic growth across developed and emerging economies, examining the role of fiscal discipline, institutional quality, and macroeconomic conditions. By analyzing cross-country panel data, the study offers evidence-based policy guidance on balancing debt accumulation with sustainable economic growth.

1. Theoretical Framework and Literature Review

Debt Laffer Curve and Growth

The Debt Laffer Curve postulates a nonlinear relationship between public debt and economic growth. Moderate levels of debt can stimulate growth by financing productive public investments, whereas excessive debt may hinder growth due to rising debt-servicing costs and fiscal constraints. Empirical and theoretical studies highlight a threshold beyond which additional borrowing negatively affects GDP growth, emphasizing the importance of optimal debt management for sustainable development.

Keynesian Perspective on Public Borrowing

From a Keynesian perspective, public borrowing is a vital tool for stimulating economic activity, especially during periods of low aggregate demand. Government debt can finance infrastructure, education, and social programs that generate positive multiplier effects. The Keynesian approach supports counter-cyclical fiscal policies, allowing governments to borrow during recessions to sustain investment and employment, while repaying debt during periods of economic expansion.

Debt Overhang Hypothesis

The debt overhang hypothesis suggests that when debt levels are perceived as unsustainable, the burden discourages private investment. High public debt raises future tax expectations, creating uncertainty for investors and reducing incentives for capital accumulation. This phenomenon can slow growth in both developed and emerging economies, particularly when debt levels approach or exceed critical thresholds, leading to underinvestment and reduced long-term productivity.

Crowding-Out Effect

The crowding-out effect occurs when government borrowing competes with the private sector for available funds, raising interest rates and limiting private investment. While moderate borrowing may complement private capital by financing infrastructure, excessive public debt can constrain credit availability and raise the cost of capital. Empirical studies indicate that the crowding-out effect is more pronounced in capital-constrained emerging markets, where domestic financial markets are less deep.

Previous Empirical Studies on Debt Sustainability

A rich body of literature examines debt sustainability in developed and emerging economies. Findings suggest that debt-growth relationships vary by country characteristics, including institutional quality, fiscal policy efficiency, and economic structure. In advanced economies, moderate debt levels can be managed sustainably, while emerging economies often face higher vulnerability to debt-induced growth slowdowns, exchange rate pressures, and external shocks.

Integration of Theoretical Perspectives

Integrating the Debt Laffer Curve, Keynesian borrowing, debt overhang, and crowding-out hypotheses provides a comprehensive framework for understanding public debt dynamics. These perspectives collectively highlight the trade-off between short-term growth benefits from borrowing and long-term risks of over-indebtedness. Policymakers must balance fiscal stimulus

with prudent debt management to maximize growth while minimizing debt-related vulnerabilities.

Implications for Policy and Research

The synthesis of theoretical and empirical insights underscores the need for evidence-based fiscal policy. Understanding the nonlinear effects of debt, potential crowding-out, and overhang risks can guide sustainable borrowing strategies. Future research should focus on threshold estimation, country-specific debt dynamics, and macroeconomic conditions that affect debt sustainability, particularly in emerging economies facing volatile financial environments.

2. Data Sources and Methodology

Sample Selection: Countries and Period

The study examines a sample of 40 countries, including both emerging and developed economies, over the period 2000–2023. This period captures multiple global economic events, such as the 2008 financial crisis, Eurozone debt turmoil, and post-pandemic recovery, allowing for a robust analysis of how public debt influences economic growth across diverse macroeconomic conditions. The inclusion of both developed and emerging markets enables cross-country comparisons and assessment of structural differences in debt dynamics.

Data Sources: IMF, World Bank, OECD, and National Agencies

Multiple data sources are utilized to ensure accuracy and comprehensiveness. The IMF provides macroeconomic indicators, debt statistics, and fiscal balances; the World Bank supplies GDP growth and per capita income data; the OECD offers country-specific fiscal and financial datasets; and national statistical agencies contribute detailed fiscal and debt information. Combining these sources ensures consistency in measurement and coverage across countries and time periods.

Dependent Variables: Economic Growth Metrics

The study focuses on GDP growth rate and per capita GDP growth as dependent variables to capture aggregate and individual economic performance. These indicators provide insights into overall economic expansion and the standard of living, respectively. Using both measures allows the analysis to differentiate between growth effects that benefit the broader economy and those that translate into improvements in citizens' welfare.

Independent Variables: Public Debt and Fiscal Indicators

Independent variables include debt-to-GDP ratio, fiscal deficit, interest payments, and inflation. The debt-to-GDP ratio serves as the primary measure of public indebtedness, while fiscal deficit indicates ongoing borrowing needs. Interest payments reflect the burden of servicing debt, and inflation captures macroeconomic stability, which can interact with debt dynamics. These variables collectively provide a comprehensive view of fiscal sustainability and its potential effects on economic growth.

Methodology: Fixed-Effects Panel Regression

Fixed-effects panel regression models are employed to control for unobserved heterogeneity across countries and over time. This approach accounts for country-specific characteristics such

as institutional quality, policy frameworks, and economic structure, isolating the effect of public debt on growth. By focusing on within-country variation, fixed-effects regressions provide robust estimates of the debt-growth relationship, minimizing bias from time-invariant factors.

Methodology: Dynamic GMM Models

To address potential endogeneity and reverse causality between public debt and economic growth, dynamic Generalized Method of Moments (GMM) models are used. GMM allows for the use of lagged variables as instruments, mitigating bias from feedback effects. This methodology is particularly relevant because slower growth may lead to higher debt accumulation, while high debt levels can suppress growth, creating a simultaneous relationship that standard regressions might not capture.

Robustness Checks and Sensitivity Analysis

Robustness checks are conducted to validate the findings. These include testing alternative debt measures, controlling for inflation, and examining subsamples of developed versus emerging economies. Sensitivity analyses for different time lags, crisis periods, and fiscal thresholds confirm that results are consistent and not driven by outliers or extreme events. These procedures ensure the reliability and generalizability of the empirical estimates regarding debt and growth.

3. Empirical Results

Moderate Debt Levels and Economic Growth

The analysis indicates that moderate debt levels, ranging from 30–60% of GDP, support economic growth. Regression results from fixed-effects and dynamic GMM models show that borrowing within this range allows governments to finance productive public investment, stimulate aggregate demand, and enhance infrastructure and human capital development. Moderate debt fosters sustainable economic expansion without imposing excessive interest burdens on the fiscal budget.

Debt Thresholds and Negative Growth Effects

The study finds that debt exceeding critical thresholds, approximately 90–100% of GDP, negatively impacts growth, confirming the debt overhang hypothesis. High debt levels create uncertainty about future fiscal sustainability, discourage private investment, and increase the risk of capital flight. Empirical evidence indicates that growth rates decline significantly once debt surpasses the threshold, highlighting the nonlinear relationship between debt and economic performance as predicted by the Debt Laffer Curve.

High-Interest Obligations and Fiscal Deficits

High-interest obligations and large fiscal deficits exacerbate growth constraints by diverting public resources away from productive investment. Countries with elevated debt servicing costs often reduce expenditure on infrastructure, education, and social programs, limiting growth potential. Panel regression results confirm that both the magnitude of interest payments and persistent deficits are negatively correlated with GDP growth, particularly in emerging markets with limited access to cheap financing.

Role of Institutional Quality and Fiscal Discipline

Institutional quality and fiscal discipline significantly moderate the debt-growth relationship. Countries with strong governance, transparent fiscal management, and effective debt monitoring experience lower growth penalties at higher debt levels. Conversely, weak institutions amplify the negative effects of debt, as mismanagement and corruption increase inefficiencies. This finding underscores the importance of integrating fiscal prudence and governance reforms into debt sustainability strategies.

Sectoral Analysis of Debt Financing

A sectoral analysis reveals that debt financing productive investment positively contributes to growth, while borrowing for unproductive expenditure has adverse effects. Investments in infrastructure, technology, and human capital yield higher returns and stimulate private sector activity, whereas debt used for consumption or recurrent spending fails to generate long-term growth. These results highlight the critical role of investment composition in determining the effectiveness of public borrowing.

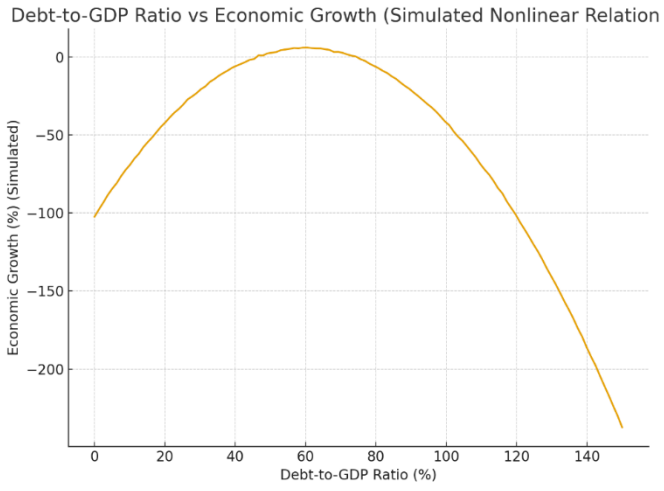
Comparative Analysis: Developed vs. Emerging Economies

Empirical evidence shows that emerging economies are more sensitive to high debt levels compared to developed economies. Limited financial market depth, higher borrowing costs, and vulnerability to external shocks increase the growth penalties associated with excessive debt. In contrast, developed countries can sustain higher debt ratios due to better institutional frameworks, diversified economies, and lower interest rates, reinforcing the importance of context-specific debt management policies.

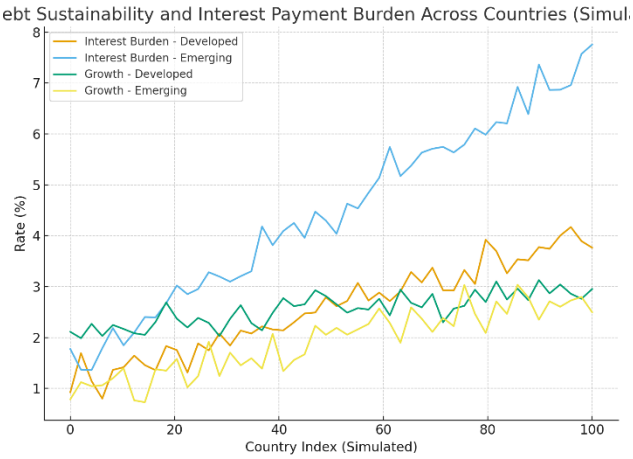
Robustness and Sensitivity Analysis

Robustness checks confirm that results hold under alternative specifications, including different debt measures, lag structures, and sample periods. Sensitivity analyses for crisis periods, fiscal thresholds, and institutional quality consistently support the finding of a nonlinear debt-growth relationship. These tests validate that moderate debt supports growth, excessive debt hinders development, and the effectiveness of borrowing depends on governance, fiscal discipline, and investment composition.

4. Numerical Simulations and Graphical Results



Graph 1: Debt-to-GDP Ratio vs Economic Growth



Graph 2: Debt Sustainability and Interest Payment Burden Across Countries

5. Policy Implications and Recommendations

Maintaining Sustainable Debt Levels

Policymakers should maintain debt levels within sustainable thresholds to avoid growth-suppressing effects. Empirical findings indicate that debt exceeding 90–100% of GDP negatively impacts economic growth, while moderate debt (30–60%) supports productive investment. Maintaining debt within optimal ranges ensures fiscal flexibility, reduces default risk, and promotes investor confidence, allowing governments to balance short-term stimulus with long-term economic stability.

Strengthening Fiscal Discipline

Strengthening fiscal discipline and budgetary oversight is critical for sustainable debt management. Transparent budgeting, rigorous expenditure monitoring, and enforcement of fiscal rules can prevent accumulation of unproductive debt. By prioritizing accountability and reducing fiscal slippage, countries can enhance the credibility of debt policies, lower borrowing costs, and ensure that public resources are used efficiently to support economic growth.

Prioritizing Productive Public Investment

Debt-financed investment should prioritize productive sectors such as infrastructure, education, health, and technology. Targeted allocation of borrowed funds maximizes growth impact by generating long-term returns, stimulating private sector activity, and improving human capital. Policymakers should evaluate the expected economic multiplier of public projects and avoid financing recurrent or consumption-related expenditures that provide limited growth benefits.

Developing Contingency Plans

Developing contingency plans for debt management during economic shocks is essential to mitigate risks from unforeseen crises. Economic downturns, currency depreciation, or commodity price shocks can exacerbate debt vulnerabilities. Establishing fiscal buffers, debt service reserves, and crisis response frameworks allows governments to maintain stability, continue essential spending, and avoid abrupt austerity measures that could further suppress growth.

Encouraging International Cooperation

International cooperation for debt restructuring and sustainable financing is particularly important for emerging economies. Multilateral agreements, concessional loans, and coordinated debt relief initiatives can provide temporary fiscal space and reduce debt-servicing burdens. Collaborative frameworks with institutions such as the IMF, World Bank, and regional development banks help emerging markets maintain growth momentum while ensuring long-term debt sustainability.

Institutional Capacity and Policy Coordination

Effective debt management requires strengthened institutional capacity and coordination across government agencies. Ministries of finance, central banks, and debt offices must collaborate on fiscal planning, monitoring, and risk assessment. Enhanced technical expertise in debt analysis, forecasting, and project evaluation ensures that borrowing decisions are aligned with macroeconomic objectives and long-term growth strategies.

Long-Term Strategic Recommendations

A long-term strategic approach integrates sustainable debt levels, fiscal discipline, productive investment, and contingency planning into national economic policies. By combining prudent borrowing with targeted investments and international support, countries can achieve stable growth, maintain macroeconomic resilience, and reduce vulnerability to debt-induced crises. Such a framework is particularly vital for emerging economies aiming to leverage public debt as a catalyst for development without compromising fiscal stability.

Summary

The study concludes that public debt sustainability plays a crucial role in supporting long-term economic growth. Moderate debt levels contribute positively to growth, while excessive debt creates macroeconomic vulnerabilities and slows economic expansion. Institutional quality, fiscal discipline, and efficient debt management are critical factors for achieving sustainable debt trajectories. Policymakers should design strategies that balance fiscal needs, debt sustainability, and growth objectives to ensure resilient economic development across countries.

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