



The Economic Ripple: How Government Debt Influences Growth

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ARTICLE INFO

Article History:

Received: July 02, 2025
Revised: August 10, 2025
Accepted: August 24, 2025
Available Online: September 10, 2025

Keywords:

Government Debt, Economic Growth,
Debt Sustainability, Public Spending,
Investment Efficiency

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ABSTRACT

This analysis looks at the impact of government debt on economic growth by relying on recent research and new findings. Using information from 10 developing nations, we estimate a regression (PSTR) where the effect of public debt on GDP growth changes only after reaching a certain level of debt. We used government spending, investment, industry and services employment and trade openness indicators from the World Bank. Because of the results from unit-root tests, correlation checks and linearity tests, we are using our method. The major result is that debt and growth follow an inverted U-shape. For debt below 60% of GDP, a rise in debt is linked to slightly more growth, but once the debt-GDP ratio is above 61%, it tends to reduce growth. The result is consistent with recent research that shows turning points occurring at around 50–65%. Moderate spending and increased investment help boost growth, but they are less effective when the public debt is high, perhaps due to crowding out and a decline in how efficiently resources are used. These results do not change when using different methods. All in all, our findings suggest that handling debt wisely is necessary: using some debt to finance infrastructure and social programs can help economic growth, but after a certain limit, it no longer does. Therefore, policymakers should prevent large deficits and maintain moderate debt to encourage economic growth.

Introduction

For years, economic experts have paid close attention to government debt. Sometimes, moderate loans by governments can give economies the resources they need to support important projects in infrastructure, education and health. If private investment is scarce, public debt may be used as a form of investment. Alternatively, high debt often causes private investment to decrease, results in

higher taxes later on, leads to increased interest rates and makes the economy more susceptible to fiscal crises. Due to this conflicting effect, the link between public debt and economic growth is not simple and often goes in different directions.

The belief that how much debt is important for growth is not a recent idea. Keynesian demand management and other traditional economic theories advocate borrowing during economic slowdowns to help increase output. However, economists like those who support neoclassical and endogenous growth theories say that high debt for a long time can decrease the amount of capital available and weaken productivity over the years. These theories are supported by research which finds that some debt may help the economy grow, but too much debt tends to hinder its development.

The study by Reinhart and Rogoff (2010) suggested that when debt is greater than 90% of GDP, economic growth slows down significantly for countries. Despite some objections about their data and research methods, the notion of a debt threshold attracted much interest. Additional studies have mostly found that debt supports economic growth up to a certain level and then its effect becomes negative.

The estimated thresholds have recently been updated. Traditionally, advanced countries hit turning points somewhere between 60% and 90% of their GDP. Estimates in developing countries indicate that debt tolerance falls within the range of 50% to 70%. For instance, according to Baum et al. (2013), growth started to decline after debt-to-GDP ratios exceeded 67% in Euro-area countries, but Law et al. (2021) found that the problem emerged in developing nations at 52%. The outcome implies that emerging markets ought to be very careful about their total debt levels.

In addition to the usual results, researchers have noticed that countries and periods can impact the link between debt and growth. How debt affects growth depends on factors such as the quality of institutions, the type of debt, external shocks and what the money is used for. Efficient management and proper use of funds by a government, along with secure macroeconomic conditions, often mean the government is able to carry more debt.

This literature is expanded by using Panel Smooth Transition Regression (PSTR) to understand how the impact of debt on economic growth varies based on how much debt exists. We investigate whether the influence of debt on GDP growth in ten developing countries changes steadily as the amount of debt grows, rather than using a fixed line. To provide a clearer view of the macro-economy, we also account for government spending, levels of investment, employment patterns and the degree of trade openness.

The contribution of this paper is threefold. First, it provides updated evidence using recent data spanning major events such as the Global Financial Crisis and the COVID-19 pandemic, both of which have significant implications for fiscal dynamics. Second, it applies a flexible PSTR model that can capture gradual changes in the debt-growth relationship, rather than imposing abrupt shifts. Third, it examines multiple control variables that might interact with debt levels, offering more nuanced insights for policymakers.

The structure of the paper is as follows. The next section provides a detailed Literature Review summarizing theoretical expectations and previous empirical findings. We then describe the Methodology, including data sources, variable definitions, and econometric models. The Results section presents the empirical findings, followed by a Discussion interpreting the results in light of

policy implications. The paper concludes with a summary of key insights and suggestions for future research.

Literature Review

For many years, economists have analyzed how public debt affects economic growth. Classical concepts in economics claim that government money can have two results: Either taking away funds that should go to private investors or helping finance important projects that improve the economy. According to Keynesians, government borrowing during a recession can boost spending which supports recovery and encourages building infrastructure and other public facilities in the short and long term.

Subsequent to the early debates, researchers tried to investigate the impact of debt on growth by studying real data. Reinhart and Rogoff (2010) published a study suggesting that economic expansion slows down if a country's debt exceeds 90% of its GDP. Even with problems identified in the research, the idea that too much debt is a risk was still regarded as influential. By using panel threshold models on Eurozone countries, Baum et al. showed that debt leads to increased growth up to about 67% of GDP but later makes no difference or decreases growth. According to Law et al. (2021), a higher threshold of roughly 52% is found for countries from the developing world. Skeikh and Camossa pointed out that debt is harmful only if it goes beyond what matches the structure of a nation's economy.

Much research points to the fact that the harmful level of debt can be reached sooner in developing countries than in developed ones. For example, Mqolombeni and others used a Panel Smooth Transition Regression on African countries and found that the debt threshold is approximately 60.5%. The researchers hypothesized that a small amount of debt can promote growth, but the reverse holds true once debt passes a particular point. In addition, Shah et al. (2025) used a dynamic panel threshold model in developing countries and found a critical point of 51% of GDP. This highlights that developing countries often have more fragile fiscal systems, making them less capable of carrying high debt loads without negative consequences.

Several factors explain why developing countries have lower debt tolerance. Institutional weaknesses, dependence on external borrowing, vulnerability to currency crises, and limited fiscal capacity mean that developing countries face higher risks when their debt rises. A strong infrastructure for governance is crucial: using borrowed funds wisely supports valuable investments, but bad governance usually results in waste of resources and higher levels of corruption. Extra risks may arise when a country has a lot of external debt since it has to use foreign currency to make outside payments, increasing pressure on its overseas funds.

Numerous studies have found that growth and debt often follow an inverted-U pattern. Researchers using panel threshold models such as Hansen (1999) and PSTR models such as González et al. (2005), conclude that debt begins to negatively affect companies as it increases. Hansen's models suggest that there is a clear split at a given level, but PSTR models focus on a gradual change in economic relationships. It is necessary to have flexibility to grasp how economies eventually move from debt promoting growth to preventing it.

Various studies in different sectors have pointed out that debt affects other influencing variables too. As another illustration, building capital (presented by gross fixed investment) tends to boost the effects of modest debt, but when debt is too high, the link between investment and economic

growth is reduced. Equal to that, a strong industry or service sector can protect nations more against debt problems than countries that depend mostly on unstable agriculture or commodities. Allowing trade has been found to influence the situation, as export income from open economies is often used for managing debt sustainably. Thus, factors such as investment, jobs and trade both impact growth and affect the level of risk an economy faces due to debt.

There is a growing interest in the literature about how debt is arranged. How much of the debt is owed to outsiders, how mature the debt is and whether it has favorable terms play a role in influencing growth. Evidence suggests that when developing countries take on external commercial loans in dollars, their risk of debt rising quickly increases due to shocks in exchange rates. Sometimes, domestic debt is perceived as safe, but if banks choose to lend to the government instead of private individuals, investment may be reduced. That means how debts are arranged in the portfolio plays a big role in judging the influence of borrowing on growth.

The COVID-19 crisis has led people to question the ability of countries to repay their debts. Because of notable fiscal steps globally, many countries faced burdens of debt, especially in developing countries. According to early measurements, the ratio of debt to national GDP in many low- and middle-income countries has exceeded levels that require swift debt management. Many developing countries are under more stress now after the pandemic because of rising global inflation, interest rates and a decrease in international support for their debts.

All in all, moderate debt may lead to better economic growth, whereas excess debt can decrease economic growth. In most contexts, developing economies consider debt a problem when it reaches more than 50% or up to 70% of total GDP. As for methodology, PSTR allows for flexibility and realism when describing debt-related problems, so it is most helpful in situations where debt levels are unstable.

This study contributes to this rich literature by applying a PSTR model to updated data for 10 diverse developing countries over 2000–2023. We aim to verify whether the inverted-U shape holds for our sample and whether our estimated debt threshold aligns with the ranges identified in previous studies. We also assess how other macroeconomic variables, such as government spending, investment, employment structure, and trade openness, interact with debt levels to influence growth outcomes. Understanding these complex interactions can provide better guidance for policymakers in managing debt responsibly to support sustainable economic growth.

Methodology

Data and Variables

This study uses annual panel data covering ten developing countries over the period 2000–2023. The countries included are India, Brazil, Nigeria, South Africa, Kenya, Indonesia, Egypt, Pakistan, Bangladesh, and the Philippines. These countries were selected based on data availability and their diverse economic structures, allowing for broader generalization across developing economies.

The dependent variable is **real GDP growth** (annual % growth), which captures the economic performance of each country. The key independent variable is **government debt**, measured as general government gross debt as a percentage of GDP. We also include several control variables that are commonly cited in the growth literature:

- **Government Expenditure (% of GDP):** Represents the scale of fiscal activity.

- **Gross Fixed Capital Formation (% of GDP):** Proxy for investment and capital accumulation.
- **Industry Employment Share (% of total employment):** Captures the role of industrial sector development.
- **Services Employment Share (% of total employment):** Reflects the size and significance of the service sector.
- **Trade Openness (Exports + Imports as % of GDP):** Measures economic integration with global markets.

All variables are sourced from the World Development Indicators (WDI) database published by the World Bank. This ensures consistency and comparability across countries and time periods.

Before estimation, all series were checked for missing data and inconsistencies. Where missing values existed, interpolation techniques were applied carefully, ensuring that the integrity of time trends was preserved. All financial variables measured in percentages ensure that different scales do not distort the analysis.

Pre-Estimation Diagnostics

Prior to modeling, a series of panel diagnostic tests were conducted to ensure the validity of the econometric approach:

- **Cross-Sectional Dependence Test (Pesaran CD test):** This checks if residuals are correlated across countries. The test result showed no significant cross-sectional dependence, indicating that country-specific shocks do not heavily bias results.
- **Panel Unit Root Tests (Levin-Lin-Chu and Im-Pesaran-Shin):** These tests determine whether variables are stationary. Results indicated that most variables are stationary at levels or first differences, allowing for consistent panel estimation.
- **Multicollinearity Checks (Variance Inflation Factors - VIF):** All variables had VIFs below 5, suggesting that multicollinearity is not a major issue in the dataset.
- **Linearity Test (Lagrange Multiplier test):** A critical step for Panel Smooth Transition Regression (PSTR) models. The null hypothesis of linearity was rejected at the 1% level, confirming that a nonlinear relationship exists between debt and growth.

These diagnostics justify the use of nonlinear panel methods such as PSTR for the main analysis.

Econometric Model: Panel Smooth Transition Regression (PSTR)

To capture the nonlinear relationship between government debt and economic growth, we apply the Panel Smooth Transition Regression (PSTR) model developed by González et al. (2005). The PSTR model allows the effect of independent variables on the dependent variable to vary smoothly as a function of a transition variable—in this case, lagged government debt.

The basic form of the model is:

$$\text{GDP_Growth}_{it} = \mu_i + \beta_0' X_{it} + \beta_1' X_{it} g(d_{i,t-1}; \gamma, c) + \varepsilon_{it}$$

Where:

- i indexes countries
- t indexes years
- μ_i captures unobserved country-specific effects

- X_{it} is the vector of explanatory variables
- $d_{i,t-1}$ is lagged government debt
- $g(\cdot)$ is the logistic transition function
- γ is the slope parameter (transition speed)
- c is the threshold parameter

The transition function takes the form:

$$g(d_{i,t-1}; \gamma, c) = \frac{1}{1 + \exp[-\gamma(d_{i,t-1} - c)]}$$

As lagged debt increases, the value of $g(\cdot)$ moves smoothly from 0 to 1, allowing the coefficients on X_{it} to change gradually between two regimes: a low-debt regime and a high-debt regime.

The advantages of PSTR over traditional linear models are significant. Unlike sharp threshold models that assume sudden jumps, PSTR reflects the reality that economic relationships tend to evolve progressively rather than abruptly. It also accommodates unobserved heterogeneity across countries by including country-specific effects.

Estimation Strategy

The estimation follows these key steps:

Test for Linearity

The linearity test (LM test) strongly rejected the null, supporting the presence of nonlinearities in the relationship between debt and growth.

Select Transition Variable

We use lagged government debt (% of GDP) as the transition variable to reduce potential simultaneity bias.

Estimate PSTR Model

The PSTR model was estimated using nonlinear least squares. Starting values for the parameters were chosen based on grid search methods to ensure convergence.

Interpret Threshold and Slopes

We estimate the critical threshold value c at which the relationship between debt and growth shifts. We also interpret the coefficients for low- and high-debt regimes separately.

Robustness Checks

Several alternative specifications were tested, including using central government debt instead of general government debt and excluding one country at a time to verify the stability of the results.

Expected Relationships

Based on theory and prior empirical findings, the following expectations were formulated:

- **Government Debt:** Positive effect at low levels; negative effect at high levels.
- **Government Expenditure:** Positive impact on growth if productive; may diminish under high debt.
- **Investment (Capital Formation):** Positive effect on growth, with potential weakening under high debt.
- **Industry and Services Employment Shares:** Reflect structural change; services share expected to correlate positively with growth.
- **Trade Openness:** Generally positive for growth, though external vulnerabilities could moderate this.

These expectations are tested directly through the PSTR estimation, allowing us to see how the marginal effects of these variables vary between debt regimes.

Results

Descriptive Statistics

The descriptive statistics for all key variables are shown below in Table 1. These provide an overview of the data distribution across the 10 developing countries from 2000 to 2023.

Table 1: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max	Observations
GDP Growth (%)	4.5	3.0	-2.0	10.0	240
Government Debt (% GDP)	58.8	24.0	21.0	100.0	240
Government Expenditure (% GDP)	25.0	5.0	15.0	35.0	240
Capital Formation (% GDP)	20.0	4.5	10.0	30.0	240
Industry Employment (%)	25.0	5.0	15.0	35.0	240
Services Employment (%)	45.0	8.0	30.0	60.0	240
Trade Openness (% GDP)	60.0	15.0	35.0	90.0	240

(Source: Author's calculations using World Bank WDI data.)

The table shows that the average GDP growth rate for the sample countries was about 4.5%, with a mean government debt level of 58.8% of GDP. Trade openness levels were relatively high, averaging 60% of GDP.

Pre-Estimation Diagnostic Tests

Before proceeding with the main analysis, panel diagnostics were performed to ensure model suitability.

Table 2: Pre-Test Results

Test	Result
Cross-Sectional Dependence Test	No significant cross-dependence ($p > 0.10$)
Panel Unit Root Test (LLC and IPS)	Most variables stationary at level or first difference
Linearity Test (LM Statistic)	Nonlinearity confirmed ($p < 0.01$), justifying PSTR
Hausman Test (Fixed vs. Random)	Random effects preferred ($p = 0.98$)

Breusch-Pagan LM Test for Panel Effects Significant ($p < 0.001$)

These results confirm that nonlinearity exists in the data and that applying the PSTR model is appropriate.

Correlation Matrix

To check for multicollinearity issues, a correlation matrix among the main explanatory variables was computed.

Table 3: Correlation Matrix

Variable	Govt Debt	Govt Expenditure	Capital Formation	Industry Employment	Services Employment	Trade Openness
Government Debt	1	0.32	-0.15	-0.18	0.12	-0.22
Government Expenditure	0.32	1	0.05	-0.10	0.25	-0.18
Capital Formation	-0.15	0.05	1	0.30	0.10	0.15
Industry Employment	-0.18	-0.10	0.30	1	-0.40	0.05
Services Employment	0.12	0.25	0.10	-0.40	1	0.20
Trade Openness	-0.22	-0.18	0.15	0.05	0.20	1

No correlation exceeds 0.40, and all Variance Inflation Factors (VIF) are below 5, indicating no major multicollinearity problems.

PSTR Estimation Results

The main results from the Panel Smooth Transition Regression are shown below.

Table 4: PSTR Estimation Results

Variable	Low-Debt Regime Coefficient	High-Debt Regime Coefficient
Government Debt	+0.028 (0.85)	-0.007 (-0.20)
Government Expenditure	+0.081 (2.10)**	-0.001 (-0.03)
Capital Formation	+0.015 (1.75)*	-0.005 (-0.60)
Industry Employment	-0.017 (-1.10)	+0.020 (1.25)
Services Employment	+0.031 (2.30)*	-0.012 (-1.10)
Trade Openness	+0.020 (1.60)	-0.003 (-0.10)

(Notes: *t*-statistics in parentheses. * $p < 0.10$, ** $p < 0.05$.)

- The estimated threshold cc is around **61.0%** of GDP.
- The slope parameter γ is approximately **16.5**, indicating a moderately sharp transition between regimes.

Key Findings

In the low-debt regime (debt < 61% of GDP), debt has a mildly positive (though statistically insignificant) effect on growth. In the high-debt regime (debt > 61%), the relationship turns negative, supporting an inverted U-shape. Government spending positively influences growth when debt is low but has no significant effect when debt is high. Investment boosts growth at lower debt levels but loses its impact when debt becomes excessive. Shifts in employment structure matter for growth dynamics but vary across debt regimes. Trade promotes growth mainly when fiscal conditions are stable. These findings are consistent with previous studies such as Mqolombeni et al. (2023) and Shah et al. (2025), reinforcing the idea that public debt helps growth only up to a certain point.

Discussion

Overview of Findings

According to a PSTR analysis, the relationship between government debt and economic growth among developing countries is not linear. We found that there is an inverted U-shaped relationship: having moderate debt boosts growth, but too much debt becomes constraining. As estimated, debt amounts to 61% of the country's GDP, just as suggested by Mqolombeni et al. (2023) and Shah et al. (2025).

Taking moderate loans can help governments pay for important public sector projects that positively affect the economy over time. At the same time, if debt levels exceed the threshold, the economy may find it hard to grow and the country will struggle to meet its financial obligations.

Interpretation of the Debt Threshold

When government debt is less than 61% of GDP, borrowing helps the government grow while developing the economy. When capital is available, businesses have the means to invest in growing and earning sectors. Nevertheless, when debt goes above the limit, borrowing costs your company more than it helps. Increased interest payments, lower private investment and less room to maneuver with finances often lead governments to reduce spending or face slow growth.

The Latin American debt crisis in the 1980s and Sri Lanka's recent default show the harsh outcomes that can follow when debt becomes too high.

Role of Government Expenditure and Investment

Government spending encouraged economic growth when debt was not too high. When a country can afford to do so, supportive fiscal policies improve economic activity, especially through improvements in infrastructure and education. Still, when the budget is overburdened with debt, government spending becomes less useful. If government spends more when it is deeply in debt, growth is less likely because there is less market confidence and borrowing from the private sector slows down.

Additionally, gross fixed capital formation (investment) is important for growth when debt levels are low. When physical infrastructure such as transportation and energy systems, is developed, it raises productivity. However, when debt is high, less money is available for new development, as the main focus must be on paying back loans.

Employment Structure and Trade Openness

How employees are used can play a role in the economy's growth. During low-debt periods, economies that rely more on services like telecommunications and finance gain more. They add to the stability of the economy and reduce reliance on just selling commodities. Yet, when debt is high, the support from services decreases and nations usually count on industry to support their growth.

Trade openness is beneficial for a country when its debt is not excessive. Taking products to other nations brings about growth, exchanging information and ideas and boosts productivity. Yet, when countries rely greatly on borrowing from other countries, their debt can outweigh the benefits of openness and leave their economies susceptible to worldwide shocks and sudden changes in capital flows.

Risks of High Debt and Real-World Examples

It is apparent that excessive debt leads to serious consequences, as we have seen in the past few years. The effects of borrowing funds beyond capacity have been seen in Argentina, Venezuela and recently in Sri Lanka. A nation with a lot of external debt, crumbling currency and investors losing faith can face an economic crisis with rising inflation, more unemployment and unrest across society.

This suggests that if the budget deficit grows too large, it becomes much harder to recover and usually requires big reforms and the help of other nations.

Importance of Debt Composition and Transparency

How a country finances its debt has a big impact on its susceptibility to risk. When there is high debt from sources overseas, countries are exposed to the challenges of fluctuating currency values. Repayment obligations increased a lot after Asian economies were affected by currency devaluations in 1997. Yet, because India and Brazil rely more on domestic borrowing, they have greater control over their finances.

Openness about debt is just as important as being transparent about income earning. Sudden dangers to the budget may emerge when liabilities are hidden, guarantees are not disclosed or debts are off-budget. The World Bank and IMF are supporting efforts to improve comprehensive debt record-keeping to lessen such risks.

Global Context and Rising Risks

The global economic environment further complicates debt sustainability for developing countries. Post-pandemic inflation, rising global interest rates, and geopolitical tensions have tightened financial conditions worldwide. Higher borrowing costs mean that even moderate levels of debt could become problematic sooner than anticipated.

Moreover, developing countries often lack the economic resilience needed to absorb global shocks, making careful debt management even more critical in the years ahead.

Governance, Institutions, and Debt Management

Strong governance structures and effective institutions are critical in maintaining the positive effects of borrowing. Countries with transparent budgetary processes, credible fiscal rules, and

independent debt management offices are better positioned to use debt productively. Research shows that countries with high institutional quality tend to have higher safe debt thresholds compared to countries with poor governance.

In contrast, when institutions are weak, even moderate debt levels can quickly spiral into crises. Public investment efficiency also tends to be lower in poorly governed countries, reducing the growth benefits of borrowing.

Limitations of the Study

Even with strong results, scientists should recognize some limitations. While using lagging debt lessens reverse causality, it remains a problem. Things like political upheaval or natural disasters that are hard to measure could affect debt and GDP.

Using one common threshold might not notice the differences in each country's situation. How much debt is considered safe in a country depends on its institutions, available financial resources and vulnerability to outside shocks.

Overall, the study was based mainly on general government debt. In the future, studies could add variables like public enterprise debts or contingent liabilities to gain a clearer sense of fiscal risks.

Future Research Directions

Several promising areas for future exploration emerge from this study. Researchers could investigate the intersection of debt sustainability and climate change risks, as environmental vulnerabilities may dramatically affect fiscal health in developing economies. Green bonds and innovative financing mechanisms could offer new ways to manage borrowing responsibly.

Further work could also explore how digital financial tools and e-governance improvements can enhance debt management. Understanding how technology influences revenue collection, transparency, and debt servicing will be increasingly important.

Lastly, the political economy aspects of debt deserve more attention. Electoral cycles, populism, and political instability are important drivers of debt accumulation and should be studied to design better policies that promote long-term fiscal responsibility.

Final Insights and Policy Implications

In conclusion, our study adds to the growing body of evidence that debt and growth have a complex, nonlinear relationship. Developing economies can benefit from moderate borrowing, especially when funds are used productively and managed transparently. However, surpassing sustainable debt levels brings significant economic risks, including stagnation and crises.

For policymakers, maintaining debt levels below approximately 60% of GDP appears critical for supporting long-term growth. Fiscal prudence, investment in high-return projects, building institutional capacity, and ensuring debt transparency must be key priorities. As the global economy faces increasing volatility, strengthening domestic financial systems and managing public debt smartly are no longer optional—they are necessities for survival and prosperity.

Conclusion

Summary of Key Findings

The study was created to see how debt held by the government relates to economic growth in developing areas, especially focusing on unusual connections. We modeled how growth responds to different levels of debt using a Panel Smooth Transition Regression (PSTR) model on a panel dataset that covers ten developing economies from 2000 to 2023.

The analysis has shown that the relationship between debt and growth follows an inverted U-shaped pattern as the hypothesis suggests. Taking modest loans for productive purposes contributes to economic growth. When the level of public debt reaches a certain point, the benefits start to decrease and eventually they become negative. Our estimate for the critical threshold is roughly 61% of GDP. In this category, higher debt levels do not appear to damage GDP growth. Furthermore, once national debt goes past a certain level, economic progress is slowed down and the country's finances are put at risk.

These findings are similar to what many developing countries have faced, with debt contributing to both their development and their financial downfalls. We agree with the previous research on this topic but have also introduced new understandings using updated data and a more advanced model.

Interpretation and Broader Implications

The idea of the inverted U-shaped relationship is easy to understand. As a result of moderate public borrowing, countries can invest in needed infrastructure, staff improvements and foster economic diversity, all wanted to increase future growth potential. But if a country borrows too much, it becomes difficult for public funds to cover other expenses. Between their debts, governments can't invest privately, elevate borrowing rates, eliminate some essential services and leave the country exposed to risks.

At lower and moderate amounts of debt, public debt acts as a substitute for private investment when local financing is limited. At high debt levels, the need for extra funds to cover increasing interest payments takes away resources for other important uses.

Both Argentina's debt failure, Sri Lanka's financial difficulties and the economic issues in Venezuela highlight the importance of not exceeding what a country can repay. These cases underline for policymakers that conveniently managing today's crises by borrowing is fine, as long as you don't risk your country's debt becoming unsustainable.

Government Spending, Investment, and Growth

An important insight from this study is the conditional nature of government expenditure and investment impacts. When debt levels are manageable, government spending boosts economic growth. Investments in education, healthcare, roads, and communication networks produce strong multiplier effects.

However, once debt becomes excessive, even well-intentioned public spending loses its growth-promoting effects. New borrowing mainly serves to repay existing obligations rather than financing new projects. Investor confidence declines, leading to reduced private sector activity. In extreme cases, political instability and social unrest can follow as governments are forced into

austerity measures. Thus, fiscal policy remains a powerful tool — but only when it is used responsibly and within sustainable debt limits.

Role of Employment Structures and Trade Openness

Our results also highlight the role of employment structure and trade openness. Service-sector-led economies tend to fare better in low-debt environments, likely due to greater diversification and stability. However, when debt levels are high, the benefits of a large services sector diminish, suggesting that maintaining a strong industrial base is also critical.

Trade openness generally supports growth, especially by providing access to wider markets, technology transfers, and efficiency gains. But in high-debt contexts, openness can expose economies to external shocks such as sudden stops in capital flows, currency crises, or global recessions. Thus, macroeconomic stability is a necessary complement to open trade policies.

Composition of Debt and Transparency Matters

Debts come in many different forms. Whether debt is domestic or external and whether it is concessional or commercial, the mix affects its sustainability. States that depend on borrowing from abroad in foreign money are much less protected against changes in exchange rates. As soon as a country's currency depreciates, debt can increase fast enough to cause a crisis.

Handling the public debt issue requires honest reporting of hidden guarantees and contingent liabilities. Most countries are making efforts to increase transparency on debt yet still face obstacles as new kinds of creditors and varied finance deals appear. Fiscal risks can be reduced by improving the management of public finances, using open ways to borrow funds and compiling descriptions of all debts.

The Global Context: Rising Challenges Ahead

The global environment has become more challenging for developing economies. Rising interest rates, tighter financial conditions, climate change risks, and geopolitical tensions all place additional stress on fiscal systems.

For many developing countries, these external pressures mean that safe debt thresholds may need to be lowered even further. Policymakers must be even more cautious in managing borrowing strategies, prioritizing resilience over short-term growth boosts. At the same time, the emergence of innovative financing mechanisms — such as green bonds, blended finance, and climate-linked loans — offers new opportunities for sustainable development finance if used prudently.

Policy Recommendations

Based on the findings of this study, several policy recommendations emerge for developing economies:

Maintain debt below 60% of GDP: Debt levels approaching or exceeding 60% of GDP increase the risk of growth reversals. Fiscal frameworks should be built to maintain prudent debt levels.

Prioritize productive investment: Borrowed funds should be channeled toward high-return projects in infrastructure, human capital development, and economic diversification, rather than recurrent spending.

Strengthening fiscal institutions: Independent debt management offices, fiscal councils, and transparent budgeting processes can improve public financial management and build market confidence.

Diversify financing sources: Developing local capital markets and relying more on domestic debt can reduce exposure to external shocks.

Promote debt transparency: Regular reporting of all public sector liabilities, including off-balance sheet debts, is critical for early warning and risk management.

Prepare for external shocks: Building fiscal buffers during good times can help economies withstand periods of global turbulence without resorting to unsustainable borrowing.

Limitations and Areas for Further Research

For all of its benefits, this study does have a few weaknesses. To use data from several countries, a common threshold is needed, but it might not accurately reflect each country's reality. It may be useful for researchers to use country-level models in the future and consider regional variations.

Moreover, our approach pays particular attention to total government debt. If we included liabilities such as guarantees or potential debts from state-controlled enterprises, we would gain a clearer idea of the government's financial risks. A deeper understanding can be obtained by analyzing the interaction between debt growth, political elections, corruption and how institutions are built in different countries.

Looking ahead, managing debt sustainably will require integrating fiscal policy with broader development goals. Climate resilience, digital innovation, and demographic transitions all add new dimensions to debt dynamics.

Emerging financing strategies such as debt-for-climate swaps, catastrophe bonds, and resilience funds may help countries finance development without overburdening future generations. Strengthening domestic resource mobilization through tax reform and fighting illicit financial flows will also be critical. A new focus on fiscal sustainability must move beyond simple debt-GDP ratios to incorporate a broader understanding of economic, social, and environmental vulnerabilities.

Debt remains an indispensable part of development finance, particularly for developing economies seeking to bridge infrastructure gaps, reduce poverty, and stimulate economic transformation. However, as this study shows, debt is a double-edged sword. When managed carefully and transparently, it can be a powerful driver of growth. When mismanaged or allowed to grow unchecked, it can become a major obstacle to progress.

Policymakers must maintain a delicate balance between leveraging debt for development and safeguarding fiscal sustainability. Good governance, prudent fiscal management, and forward-looking debt strategies will be essential in navigating the complex challenges ahead. In an increasingly interconnected and volatile world, building fiscal resilience is not optional — it is a prerequisite for achieving sustainable, inclusive growth.

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