

Public Debt and Economic Growth: A Theoretical and Empirical Perspective

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Abstract

Public debt is one of the most important instruments through which governments finance public expenditure, infrastructure, social programmes, economic stabilization, and development. At moderate and sustainable levels, public borrowing can support economic growth by financing productive investment, smoothing economic fluctuations, and enabling governments to respond to crises. However, excessive or poorly managed public debt can create substantial economic costs through higher debt-servicing obligations, reduced fiscal space, increased borrowing costs, lower private investment, financial instability, and vulnerability to external shocks. The relationship between public debt and economic growth is therefore complex and depends on the composition, maturity, currency denomination, purpose, and sustainability of debt, as well as on the institutional and macroeconomic characteristics of the borrowing country.

This paper examines the relationship between public debt and economic growth from both theoretical and empirical perspectives. It reviews major theoretical approaches, including the traditional Keynesian perspective, neoclassical theory, debt overhang theory, crowding-out theory, the Ricardian equivalence proposition, and endogenous growth theory. The paper then examines the channels through which public debt can affect economic performance, including public investment, aggregate demand, interest rates, private investment, taxation, productivity, inflation, and financial stability. Particular attention is given to the distinction between productive and unproductive borrowing. Public debt used to finance infrastructure, education, health, research, and productive capital may enhance long-term growth, whereas debt used primarily for recurrent expenditure or inefficient programmes may increase future fiscal burdens without generating corresponding productive capacity.

The empirical literature presents mixed findings regarding the relationship between debt and growth. Some studies identify nonlinear relationships in which moderate debt is compatible with growth while high debt is associated with weaker economic performance. Other studies question the existence of a universal debt threshold and emphasize country-specific factors, reverse causality, data limitations, institutional quality, and differences in debt composition. Recent international evidence further demonstrates that high debt burdens can constrain fiscal policy and increase vulnerability to higher interest rates and refinancing risks. The paper argues that public debt should therefore not be assessed solely through a single debt-to-GDP threshold. Instead, debt sustainability should be evaluated through a broader framework incorporating economic growth, interest-growth differentials, primary balances, debt maturity, currency composition, institutional capacity, contingent liabilities, and the productivity of government expenditure.

The paper concludes that sustainable public borrowing can be an important instrument of economic development when it finances productive investment and is supported by credible fiscal institutions. The objective of public debt policy should consequently not be debt

minimization in isolation but the maintenance of a sustainable debt trajectory while maximizing the developmental and productive benefits of borrowing.

Keywords: Public Debt, Economic Growth, Fiscal Policy, Debt Sustainability, Crowding Out, Debt Overhang, Public Investment, Fiscal Deficit, Interest Rates, Government Borrowing, Macroeconomic Stability, Developing Economies.

1. Introduction

Public debt occupies a central position in modern fiscal policy. Governments borrow to finance expenditures when current revenues are insufficient to meet public spending requirements. Borrowing can allow governments to finance infrastructure, education, healthcare, defence, social protection, economic stabilization, and emergency programmes without requiring immediate increases in taxation.

Public debt is therefore not inherently harmful. In many circumstances, government borrowing is economically rational because the benefits of public investment extend over several years. Financing a long-lived infrastructure project entirely through current taxation may impose an excessive burden on the present generation even though future generations will also benefit from the project. Borrowing can distribute the cost of investment over time.

However, debt becomes problematic when borrowing grows faster than the government's capacity to generate income and fiscal resources. Persistent fiscal deficits can cause debt to accumulate, increasing interest payments and reducing the resources available for productive public expenditure. If investors become concerned about a government's repayment capacity, borrowing costs can rise, further increasing debt-service obligations.

The economic relationship between debt and growth is therefore not simply linear. Public debt can support growth at one stage and constrain it at another. The effect depends on the level and structure of debt, the purpose of borrowing, the state of the economy, monetary conditions, institutional quality, and investor confidence.

The debate became particularly significant following the global financial crisis of 2008–2009, the European sovereign-debt crisis, and the fiscal expansion associated with the COVID-19 pandemic. Governments increased borrowing substantially to support households, businesses, healthcare systems, and economic activity.

The International Monetary Fund has emphasized that rising public debt creates challenges for fiscal policy, particularly when governments face higher interest costs and limited fiscal space. The IMF's *Fiscal Monitor* has repeatedly highlighted the need to rebuild fiscal buffers while protecting productive and socially important expenditures. (imf.org)

The World Bank has similarly warned that high levels of debt can increase vulnerability among developing economies, particularly where borrowing costs are high and fiscal institutions are weak. (worldbank.org)

The central research question is therefore:

Under what conditions does public debt promote economic growth, and under what conditions does it constrain growth?

This paper addresses this question through an integrated theoretical and empirical perspective.

2. Background of the Problem

Governments face a fundamental fiscal choice between taxation, expenditure reduction, monetary financing, and borrowing.

Borrowing allows governments to finance expenditures without immediately increasing taxes. However, debt creates future obligations.

The basic relationship can be expressed as:

Government Borrowing → Higher Current Expenditure → Future Debt-Service Obligations

If borrowing finances productive investment:

Borrowing → Public Capital → Higher Productivity → Higher Future Output and Revenue

But if borrowing finances expenditure without generating productive capacity:

Borrowing → Higher Expenditure → Higher Debt → Higher Debt Service → Reduced Fiscal Space

The economic consequences therefore depend significantly on how borrowed funds are used.

2.1 Global Public Debt Trends

Global public debt has increased substantially over recent decades. The COVID-19 pandemic caused governments around the world to expand spending while tax revenues declined, generating exceptionally large fiscal deficits.

The IMF has continued to identify high public debt as a major challenge for global economic policy and has emphasized the importance of fiscal adjustment strategies that protect growth-enhancing investments. (imf.org)

The issue is particularly important for emerging and developing economies because they may face higher borrowing costs and greater exposure to exchange-rate fluctuations.

2.2 Public Debt in Developing Economies

Developing economies often borrow to finance infrastructure and development projects because domestic savings may be insufficient.

However, they may face:

- high interest rates;
- foreign-currency debt;
- exchange-rate depreciation;
- limited tax capacity;
- refinancing risks;
- external shocks.

Consequently, the same level of debt can have different economic consequences across countries.

3. Objectives of the Study

The objectives of this paper are:

1. To examine the theoretical relationship between public debt and economic growth.
2. To explain major theories of public debt.
3. To identify the channels through which public debt influences growth.
4. To examine empirical evidence concerning debt and economic performance.
5. To analyse the importance of debt composition and debt sustainability.
6. To examine the role of public investment in determining the growth effects of debt.
7. To identify the risks associated with excessive public borrowing.
8. To provide policy recommendations for sustainable debt management.

4. Conceptual Framework

The relationship between public debt and economic growth can be represented as follows:

Public Borrowing

↓

Government Expenditure

↓

Productive Expenditure

Infrastructure

Education

Health

Technology

Research

↓

Higher Productivity

↓

Higher Economic Growth

Alternatively:

Unproductive Expenditure

Recurrent

Inefficient

Administrative expenditure

consumption
subsidies

↓

Higher Debt-Service Burden

↓

Reduced Fiscal Space

↓

Lower Public Investment

↓

Lower Potential Growth

The overall relationship can therefore be summarized as:

Public Debt → Fiscal Policy → Investment/Productivity → Economic Growth

while also operating through:

Public Debt → Interest Rates → Private Investment → Economic Growth

and:

Public Debt → Fiscal Risk → Macroeconomic Stability → Economic Growth

5. Theoretical Perspectives on Public Debt and Growth

5.1 Keynesian Perspective

The Keynesian approach emphasizes the role of aggregate demand.

During economic downturns, private consumption and investment may decline. Government borrowing can allow the state to increase expenditure and support aggregate demand.

The mechanism is:

Higher Government Spending → Higher Aggregate Demand → Higher Output → Higher Employment

The effect can be particularly strong when there are unemployed resources and monetary policy is constrained.

From this perspective, public borrowing during recessions may stabilize economic activity rather than reduce it.

However, Keynesian theory does not imply unlimited borrowing. Persistent deficits during periods of strong economic growth may generate inflationary and debt-sustainability pressures.

5.2 Neoclassical Perspective

The neoclassical approach emphasizes capital accumulation and resource allocation.

Government borrowing can increase demand for loanable funds and potentially raise real interest rates.

Higher interest rates may reduce private investment.

This is known as the **crowding-out effect**.

The basic mechanism is:

Higher Public Borrowing → Increased Demand for Funds → Higher Interest Rates → Lower Private Investment

Lower private investment can reduce capital accumulation and long-term productivity.

However, crowding out depends on monetary conditions, financial-market openness, savings, and the economy's capacity utilization.

5.3 Ricardian Equivalence

The Ricardian equivalence proposition, associated with Robert Barro's formulation of an earlier idea by David Ricardo, argues that under highly restrictive assumptions, debt-financed government spending may not increase aggregate demand because households anticipate future taxation.

The reasoning is:

Higher Government Debt Today → Expected Higher Future Taxes → Higher Household Saving → Limited Demand Effect

The theory assumes, among other things, forward-looking households, perfect capital markets, and certain tax and borrowing conditions.

In practice, these assumptions often do not fully hold.

Credit constraints, uncertainty, liquidity constraints, and differences between households can make debt financing have significant real effects.

5.4 Debt Overhang Theory

Debt overhang occurs when a country's existing debt becomes sufficiently large that expected future repayment obligations discourage investment.

Private investors may anticipate:

- higher future taxes;
- inflation;
- financial instability;
- capital controls;
- debt restructuring.

This can reduce current investment.

The mechanism is:

High Debt → Expected Future Fiscal Burden → Lower Investment → Lower Growth

Debt overhang is particularly important for economies with high external debt.

5.5 Endogenous Growth Theory

Endogenous growth theory emphasizes knowledge, human capital, innovation, and productivity.

Public debt can support long-term growth when borrowed resources finance:

- education;
- research;
- infrastructure;
- healthcare;
- technology.

These expenditures can increase the productive capacity of the economy.

However, if debt finances consumption rather than productivity-enhancing investment, long-term growth effects may be weak or negative.

6. Public Debt and Economic Growth: Transmission Channels**6.1 Public Investment Channel**

Debt-financed public investment can increase the economy's productive capacity.

Examples include:

- roads;
- railways;
- ports;
- electricity;
- irrigation;
- digital infrastructure;
- schools;
- hospitals.

Such investments may increase private-sector productivity.

6.2 Interest Rate Channel

Large government borrowing may increase demand for financial resources.

If domestic savings are limited, government borrowing can put upward pressure on interest rates.

Higher interest rates can discourage private investment.

6.3 Private Investment Channel

Private firms invest when expected returns exceed financing costs.

Higher government borrowing can reduce the availability or affordability of credit.

This can be particularly problematic for small businesses.

6.4 Taxation Channel

High debt may require future tax increases.

Higher taxation can affect:

- labour supply;
- consumption;
- investment;
- entrepreneurship.

However, the impact depends on the type of tax used.

6.5 Productivity Channel

Debt-financed public infrastructure can improve productivity.

For example:

Better Transport Infrastructure → Lower Logistics Costs → Higher Firm Productivity

Similarly:

Education Investment → Higher Human Capital → Higher Labour Productivity

6.6 Confidence Channel

High debt can influence investor confidence.

If investors perceive debt as unsustainable, they may demand higher risk premiums.

This can increase borrowing costs and intensify fiscal problems.

6.7 Exchange Rate Channel

Foreign-currency debt creates additional risk.

If the domestic currency depreciates:

Currency Depreciation → Higher Domestic Value of Foreign Debt → Higher Debt-Service Burden

This is particularly important for emerging economies.

7. Debt Sustainability

Debt sustainability refers to the ability of a government to meet its current and future debt obligations without requiring exceptional financing, default, or economically damaging adjustment.

A simplified debt-dynamics equation can be written as:

$$\Delta d \approx (r - g)d - pb$$

where:

- **d** = debt-to-GDP ratio;
- **r** = effective interest rate;
- **g** = nominal economic growth rate;
- **pb** = primary balance as a share of GDP.

The equation illustrates an important principle.

When:

$$g > r$$

economic growth can help stabilize the debt ratio.

When:

$$r > g$$

debt dynamics become more difficult, particularly if the government also runs primary deficits. Therefore, debt sustainability depends not only on the debt stock but also on the relationship between interest rates and economic growth.

8. Public Debt Composition

The level of debt alone provides incomplete information.

Important dimensions include:

8.1 Domestic vs. External Debt

Domestic debt is denominated in domestic currency and held largely by domestic investors.

External debt is owed to foreign creditors and may create exchange-rate risks.

8.2 Short-Term vs. Long-Term Debt

Short-term debt must be refinanced frequently.

This increases refinancing risk.

Long-term debt generally provides greater fiscal stability.

8.3 Fixed vs. Variable Interest Rates

Variable-rate debt can become expensive when interest rates rise.

Fixed-rate debt provides greater predictability.

8.4 Local vs. Foreign Currency

Foreign-currency debt can become more burdensome following currency depreciation.

8.5 Concessional vs. Commercial Debt

Concessional loans generally have lower interest rates and longer maturities.

Commercial borrowing may carry higher costs.

9. Empirical Perspective

The empirical relationship between public debt and economic growth has produced considerable debate.

9.1 Debt-Growth Correlation

A large body of research identifies a negative association between very high public debt and economic growth.

However, correlation does not necessarily establish causality.

Weak growth can itself cause debt to increase because:

- tax revenues decline;
- welfare spending rises;
- fiscal deficits increase.

Thus:

Debt → Lower Growth

may occur simultaneously with:

Lower Growth → Higher Debt

This creates a major endogeneity problem.

9.2 Reinhart and Rogoff Debate

Reinhart and Rogoff's influential 2010 study reported a nonlinear relationship between government debt and economic growth and received substantial attention in policy debates.

Their work was subsequently challenged by Herndon, Ash, and Pollin, who identified coding, data-selection, and methodological issues in the analysis.

The controversy demonstrated an important lesson: claims about universal debt thresholds should be treated cautiously.

9.3 Nonlinear Relationship

Several studies have suggested that the debt-growth relationship may be nonlinear.

A simplified conceptual relationship is:

Low/Moderate Debt → Potentially Positive or Neutral

High Debt → Increasing Growth Constraints

This suggests an inverted-U-type relationship.

However, there is no universally valid debt threshold that applies to all countries.

9.4 IMF Evidence

IMF research has emphasized that the relationship between public debt and growth varies according to:

- debt level;
- debt composition;
- economic conditions;
- institutional quality;
- interest rates;
- growth prospects.

The IMF has also emphasized that fiscal adjustment should be designed to preserve growth-enhancing expenditures. (imf.org)

10. Public Debt and Developing Economies

Developing economies face distinctive debt challenges.

10.1 Limited Fiscal Capacity

Low tax-to-GDP ratios limit governments' ability to service debt.

10.2 High Borrowing Costs

Developing economies often pay higher risk premiums than advanced economies.

10.3 Currency Risk

Foreign-currency borrowing exposes governments to exchange-rate fluctuations.

10.4 External Shocks

Developing economies may be particularly vulnerable to:

- commodity-price shocks;
- global interest-rate increases;
- capital outflows;
- exchange-rate depreciation;
- natural disasters.

10.5 Debt-Service Burden

High debt-service payments can reduce resources available for:

- education;
- healthcare;
- infrastructure;
- poverty reduction.

This creates an important development trade-off.

11. Public Debt and Public Investment

The economic consequences of debt depend heavily on what governments do with borrowed funds.

Productive Borrowing

Debt used for:

- infrastructure;
- education;
- healthcare;
- research;

- digital systems;
- energy;
- industrial development

can increase future productive capacity.

Consumption-Focused Borrowing

Debt used primarily for:

- recurrent administrative spending;
- inefficient subsidies;
- politically motivated expenditure;
- persistent operating deficits

may create future liabilities without equivalent economic returns.

The distinction between productive and unproductive borrowing is therefore central to debt policy.

12. Public Debt and Inflation

Public debt can interact with inflation in several ways.

Large fiscal deficits may increase aggregate demand.

If the economy is operating near capacity:

Fiscal Expansion → Excess Demand → Inflationary Pressure

High inflation can reduce the real value of nominal debt, but persistent inflation may undermine investor confidence and increase nominal interest rates.

In extreme circumstances, governments may face pressure to monetize fiscal deficits.

This can generate significant macroeconomic instability.

13. Public Debt and Financial Stability

High public debt can affect financial institutions because banks and other financial institutions may hold government securities.

A sovereign debt crisis can therefore become a banking-sector crisis.

The mechanism is:

Fiscal Stress → Decline in Government Bond Values → Bank Balance-Sheet Deterioration → Reduced Credit → Lower Investment

This sovereign-bank nexus is particularly important in economies where banks hold large amounts of domestic government debt.

14. Public Debt and Private Investment

Crowding out is one of the most important channels linking debt to growth.

Suppose an economy has limited domestic savings.

Government borrowing increases demand for funds.

If interest rates rise:

Higher Interest Rates → Higher Cost of Capital → Lower Private Investment

However, this effect can be weaker when:

- the economy has substantial financial liquidity;
- central banks maintain accommodative monetary conditions;
- foreign capital is available;

- public investment raises private-sector productivity.

Therefore, public debt can sometimes **crowd in** private investment rather than crowd it out.

For example:

Government Infrastructure → Lower Business Costs → Higher Private Investment

This distinction is essential.

15. Public Debt and Economic Development

Economic development is broader than GDP growth.

Public debt can influence:

- poverty;
- employment;
- infrastructure;
- education;
- health;
- inequality;
- intergenerational welfare.

High debt-service burdens can reduce social expenditure.

This can create a vicious cycle:

High Debt → High Debt Service → Lower Development Spending → Lower Human Capital → Lower Productivity → Lower Growth → Higher Debt Burden

Conversely:

Productive Borrowing → Higher Infrastructure/Human Capital → Higher Productivity → Higher Growth → Stronger Revenue → Greater Debt Sustainability

16. Institutional Quality and Debt Sustainability

Institutional quality is a major determinant of debt outcomes.

Strong fiscal institutions can improve:

- budget planning;
- expenditure control;
- revenue collection;
- debt management;
- transparency.

Countries with credible fiscal institutions may borrow at lower costs because investors have greater confidence in repayment.

Important institutional mechanisms include:

- fiscal responsibility legislation;
- independent fiscal councils;
- transparent budgets;
- medium-term expenditure frameworks;
- debt-management offices.

17. Public Debt in the Post-Pandemic Economy

The COVID-19 pandemic created an exceptional fiscal shock.

Governments increased spending on:

- healthcare;
- unemployment support;
- business assistance;
- social protection;
- economic stimulus.

At the same time, economic contraction reduced government revenues.

Consequently:

Lower Revenue + Higher Expenditure = Larger Fiscal Deficits

which increased public debt.

The post-pandemic challenge is to restore fiscal sustainability without unnecessarily reducing productive investment or social protection.

The IMF's *Fiscal Monitor* continues to emphasize the need for credible medium-term fiscal strategies while protecting essential development and growth-enhancing expenditures. (imf.org)

18. Public Debt and Emerging Economies

Emerging economies face a particularly complex debt environment.

They often require substantial borrowing to finance:

- infrastructure;
- energy transition;
- urbanization;
- education;
- health;
- industrialization.

At the same time, they may face volatile capital flows and higher borrowing costs.

The World Bank's debt-related research highlights the vulnerability of developing economies to debt-service pressures and changing global financial conditions. (worldbank.org)

The solution is therefore not necessarily to eliminate borrowing but to improve the quality and sustainability of borrowing.

19. Policy Recommendations

19.1 Establish Sustainable Debt Targets

Governments should maintain debt within levels compatible with:

- economic growth;
- interest rates;
- revenue capacity;
- fiscal institutions.

Rigid universal thresholds should be avoided.

19.2 Prioritize Productive Investment

Borrowing should increasingly finance:

- infrastructure;
- education;
- health;
- research;

- digital transformation;
- climate resilience.

19.3 Strengthen Domestic Revenue Mobilization

Governments should improve:

- tax administration;
- compliance;
- broadening of the tax base;
- digital tax systems.

Higher stable revenue reduces dependence on borrowing.

19.4 Improve Debt Management

Debt-management authorities should optimize:

- maturity;
- interest-rate structure;
- currency composition;
- refinancing schedules.

19.5 Develop Domestic Capital Markets

Deep domestic bond markets can reduce dependence on foreign-currency borrowing.

19.6 Increase Fiscal Transparency

Governments should disclose:

- debt levels;
- guarantees;
- contingent liabilities;
- public-private partnership obligations;
- debt-service projections.

19.7 Protect Growth-Enhancing Expenditure

Fiscal consolidation should avoid indiscriminate reductions in:

- infrastructure;
- education;
- health;
- research.

19.8 Establish Fiscal Rules

Fiscal rules can limit excessive deficits while allowing flexibility during major economic shocks.

19.9 Strengthen Independent Fiscal Institutions

Independent fiscal councils can improve:

- forecasting;
- fiscal transparency;
- policy credibility.

19.10 Maintain Countercyclical Fiscal Policy

Governments should build fiscal buffers during periods of strong economic growth so that they can borrow during recessions without creating debt crises.

20. Theoretical and Empirical Synthesis

The theoretical and empirical literature suggests that the relationship between public debt and growth cannot be described adequately through a single universal proposition.

Three broad possibilities can be identified.

Scenario 1: Productive Debt

Debt → Productive Investment → Higher Productivity → Higher Growth

Here, borrowing supports economic development.

Scenario 2: Neutral Debt

Debt → Current Expenditure → Limited Productivity Effect

Debt has relatively limited long-term effects on growth.

Scenario 3: Excessive Debt

Debt → Higher Interest Burden → Crowding Out → Lower Investment → Lower Growth

Debt becomes a constraint on economic performance.

The challenge for policymakers is to identify where an economy lies within this spectrum.

21. Future Research Directions

Future research should examine the public-debt-growth relationship using more sophisticated approaches.

Important areas include:

1. The composition of public debt.
2. Domestic versus external debt.
3. The role of interest-growth differentials.
4. Debt maturity structures.
5. Currency denomination.
6. Public investment efficiency.
7. Institutional quality.
8. Inflation and debt interactions.
9. Financial-market development.
10. Climate-related fiscal risks.
11. Demographic ageing and future liabilities.
12. Contingent liabilities arising from public enterprises and public-private partnerships.

Future empirical research should also distinguish between short-run and long-run effects. Debt-financed fiscal expansion may increase output in the short term while producing different long-term consequences.

22. Conclusion

Public debt is neither inherently beneficial nor inherently harmful to economic growth. Its impact depends on how much a government borrows, why it borrows, how efficiently the funds are used, how the debt is structured, and whether the economy has sufficient capacity to service its obligations.

Moderate and well-managed public borrowing can support economic development. Debt-financed infrastructure, education, healthcare, technology, and other productive investments can increase the productive capacity of the economy. During recessions, borrowing can also stabilize aggregate demand and prevent deeper economic contractions.

However, excessive debt can generate significant economic costs. Higher debt-service obligations can reduce fiscal space, while higher borrowing costs may crowd out private investment. Foreign-currency debt can increase vulnerability to exchange-rate shocks, and large refinancing requirements can create financial instability. Persistent fiscal deficits may also increase inflationary pressures and undermine investor confidence.

The empirical literature does not support a simple universal debt threshold above which growth necessarily collapses. The relationship is influenced by reverse causality, country-specific characteristics, debt composition, institutional quality, monetary conditions, and the purpose of borrowing. The debate surrounding debt-growth thresholds demonstrates the importance of methodological caution when interpreting empirical correlations.

The most important policy distinction is therefore between **productive and unproductive public debt**.

Productive debt can generate future economic returns:

Borrowing → Investment → Productivity → Growth → Revenue → Debt Sustainability

Unproductive borrowing can create the opposite process:

Borrowing → Consumption/Low-return Expenditure → Debt Service → Reduced Fiscal Space → Lower Investment → Weaker Growth

Public debt policy should therefore focus on maximizing the first pathway while minimizing the second.

A sustainable fiscal strategy should combine responsible borrowing with strong revenue mobilization, effective public investment, transparent debt management, credible fiscal institutions, and countercyclical fiscal policy.

For emerging and developing economies, the issue is particularly important because development requires substantial investment while borrowing costs and external vulnerabilities may be high. These countries should therefore prioritize long-term domestic productive capacity and avoid excessive reliance on foreign-currency debt.

Ultimately, the appropriate objective is not simply "**low public debt**", but "**sustainable public debt that supports long-term economic development.**"

A government that borrows to build productive capacity may strengthen future generations' economic opportunities. A government that borrows primarily to finance persistent consumption may transfer a financial burden to future taxpayers without creating equivalent productive assets.

Public debt should therefore be evaluated as part of a broader fiscal-development framework in which the quality of expenditure, economic growth, interest costs, institutional capacity, and intergenerational welfare are considered together.

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