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DETERMINANTS OF PUBLIC DEBT: AN INTEGRATED FISCAL, ECONOMIC, INSTITUTIONAL AND CLIMATE-RISK FRAMEWORK

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Abstract:

Public debt is shaped by more than the size of a government's fiscal deficit. Spending decisions, economic performance, institutional quality and increasingly climate-related shocks can all alter borrowing requirements and debt sustainability. This conceptual paper develops an integrated framework linking public debt with five determinants: government consumption, military expenditure, economic growth, corruption and climate risk. The framework draws on Keynesian Theory, Growth Theory, Institutional Theory and Fiscal Policy Theory, while a climate-fiscal perspective is used to explain how physical and transition risks enter debt dynamics. A structured narrative review of recent and foundational literature is used to identify the main transmission mechanisms and areas of disagreement. The review suggests that government consumption and military expenditure can

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raise debt when additional spending is deficit-financed; economic growth can strengthen fiscal capacity and reduce the relative burden of debt; corruption can increase fiscal costs through weak governance; and climate risk can create simultaneous pressure through disaster losses, reconstruction expenditure, weaker output, lower revenue and sovereign-risk repricing. The paper develops five propositions from these relationships. The paper contributes by bringing conventional fiscal, economic and institutional determinants together with climate risk in a single framework and by identifying the conditions under which the proposed relationships may strengthen or weaken.

Keyword:

Climate Risk; Conceptual Framework; Corruption; Fiscal Sustainability; Economic Growth; Government Consumption; Military Expenditure; Public Debt

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Introduction

Public borrowing is a normal instrument of fiscal management. Governments may borrow to finance infrastructure, smooth expenditure during downturns, respond to emergencies or spread the cost of long-lived investments over time. The policy concern, therefore, is not debt itself, but whether the government can service its obligations without an adjustment that places excessive pressure on economic activity or public welfare.

This concern has become more visible as governments face several pressures at the same time. The International Monetary Fund (2026) reports that global public debt was just below 94% of GDP in 2025 and is projected to approach 100% of GDP by 2029. Higher interest costs, social spending needs and defence requirements are adding to fiscal pressures, while the OECD expects debt ratios among its members to remain elevated through 2027 (Fund, 2026; OECD, 2026). Bank for International Settlements (BIS) (2026) also highlights the sensitivity of highly indebted sovereigns to changing financial market conditions.

These developments suggest that public debt should be examined as a multidimensional outcome. Fiscal expenditure remains important, but debt dynamics are also affected by the pace of economic growth and by the quality of institutions that determine how public resources are collected and used. More recently, climate change has become relevant to debt sustainability because physical disasters can reduce output and revenue while creating new expenditure obligations. The transition to a lower-carbon economy can generate another form of fiscal pressure through public investment, subsidies and support for affected households and firms.

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Recent evidence illustrates the breadth of these channels. Patel & Peralta-Alva (2024) show that growth shocks explain a substantial share of movements in debt-to-GDP ratios in advanced economies. Schuster et al. (2024) identify fiscal policy and stock-flow adjustments as important sources of debt surges, while Ciaffi et al. (2024) show that the composition of government expenditure matters for sustainability. Leão & Leão (2025) further demonstrate that fiscal expansion can improve the debt ratio under conditions of underutilised capacity. Institutional evidence from Cooray & Özmen (2024) suggests that governance effects differ across debt levels. In the climate literature, Seghini (2026) links physical and transition risks to output growth, primary balances and real interest rates, while Romagnoli & Santini (2025) identify a relationship between climate risk and sovereign borrowing costs.

The problem is not a lack of studies on public debt. Rather, the literature is dispersed across separate explanations. Fiscal studies tend to focus on spending and deficits; growth studies examine the debt-growth relationship; governance studies emphasise institutional quality; and climate studies increasingly examine sovereign exposure to environmental shocks. Less attention has been given to how these determinants can be organised within one framework without assuming that they operate in the same way.

Against this background, the present paper develops an integrated conceptual framework in which public debt is the dependent variable and government consumption, military expenditure, economic growth, corruption and climate risk are the proposed determinants. The specific contribution is the addition of climate risk to a conventional fiscal-economic-institutional structure and the identification of the transmission mechanisms that connect each determinant to debt. The framework is intended to guide subsequent empirical testing rather than to claim that the relationships are uniform across countries or time.

Concept of Public Debt

Public debt refers to the accumulated financial obligations arising from government borrowing. Borrowing can support stabilisation and development when resources are used efficiently, and future fiscal capacity is sufficient to meet repayment and interest obligations. Debt sustainability therefore depends on the interaction between the debt stock, economic growth, interest costs, primary fiscal balances and the government's ability to raise revenue.

A useful distinction is between a temporary increase in borrowing and persistent debt accumulation. Temporary borrowing may be justified during a recession or emergency if the government subsequently restores its fiscal position. Persistent borrowing becomes more difficult to sustain when interest costs rise faster than the economy's capacity to generate revenue.

Climate shocks add a further complication. A disaster can create reconstruction obligations at precisely the time when economic activity and tax revenue are weakened. Transition policies can also require upfront public expenditure even where the long-term objective is to reduce climate-related losses. The climate-sovereign literature therefore points to a potential feedback mechanism in which climate shocks weaken fiscal space and limited fiscal space constrains adaptation (Zenios, 2024).

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Review Method for the Conceptual Paper

This paper adopts a structured narrative literature review rather than a formal meta-analysis. The purpose is to synthesise theoretical arguments and recent empirical findings that explain how the five proposed determinants may influence public debt. The review gives particular attention to peer-reviewed studies, IMF and OECD publications and recent work published from 2024 to 2026, while retaining selected earlier studies where they provide established theoretical or empirical foundations.

The literature was organised into five themes corresponding to the proposed determinants: (i) government consumption, (ii) military expenditure, (iii) economic growth, (iv) corruption and institutional quality, and (v) climate risk. For each theme, the review considered the direction of the reported relationship, the mechanism through which the determinant affects debt, and whether the relationship appears conditional, nonlinear or potentially bidirectional. This thematic approach was used to move from isolated findings to the integrated framework presented later in the paper.

The review is conceptual rather than systematic in the PRISMA sense. Accordingly, the paper does not claim exhaustive coverage of all public-debt studies. Its purpose is to establish a theoretically coherent set of relationships that can subsequently be tested using time-series or panel data.

Theoretical Foundations

Keynesian Theory

Keynesian theory provides the main basis for understanding the fiscal spending variables. Countercyclical government expenditure can support aggregate demand when private demand is weak. However, if additional expenditure is financed through borrowing and is not followed by sufficient revenue or output gains, the fiscal deficit and debt stock may increase. Schuster et al. (2024) provide recent evidence consistent with this mechanism by identifying spending-driven fiscal expansions as a source of persistent debt increases.

Growth Theory

Growth theory connects economic performance with the government's fiscal capacity. Stronger growth can widen the tax base, raise public revenue and make existing debt easier to service. Growth also increases the denominator of the debt-to-GDP ratio. The relationship may nevertheless run in both directions because high debt can reduce investment or increase financing costs. Patel and Peralta-Alva (2024) show that GDP growth shocks are an important driver of movements in debt-to-GDP ratios across advanced economies, highlighting the role of economic conditions in public debt dynamics.

Institutional Theory

Institutional Theory explains why similar levels of spending can produce different fiscal outcomes. Effective budget institutions, procurement systems, transparency, and accountability can improve the efficiency of public expenditure. Corruption can work in the opposite direction by creating leakage, distorting priorities and increasing the cost of delivering public services.

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Cooray & Özmen (2024) find that institutional effects vary across the distribution of public debt and report a debt-reducing association with corruption control in their EU sample. This supports the inclusion of corruption as an institutional determinant rather than treating debt as purely a fiscal outcome.

Fiscal Policy Theory

Fiscal Policy Theory places debt within the government's intertemporal budget constraint. Persistent primary deficits require financing through additional borrowing unless they are offset by revenue growth, favourable growth-interest differentials or future expenditure adjustments. This perspective links the spending variables with economic growth and helps explain why the same expenditure increase may have different debt effects under different macroeconomic conditions.

Climate-Fiscal Perspective

The climate-fiscal perspective is used here as an emerging analytical lens rather than as a fully established standalone theory. It extends debt-sustainability analysis by examining how physical and transition climate risks alter output, primary balances and financing conditions. Seghini (2026) identifies these three channels as central to the climate-public-debt relationship, while Soyres et al. (2026) provide evidence that climate shocks can increase sovereign default risk.

Taken together, these theoretical perspectives provide complementary explanations for the proposed determinants of public debt. Keynesian Theory explains the potential debt implications of government consumption and military expenditure through aggregate demand and deficit financing, while Growth Theory explains how economic growth influences revenue generation and debt-servicing capacity. Institutional Theory provides the basis for examining corruption through its effects on public resource allocation and expenditure efficiency. Fiscal Policy Theory connects these determinants through the government's intertemporal budget constraint, explaining how persistent fiscal deficits contribute to debt accumulation. Finally, the climate-fiscal perspective extends this analysis by explaining how physical and transition climate risks may affect public debt through disaster-related expenditure, economic output, government revenue and financing conditions. Together, these perspectives establish the theoretical basis for the five proposed determinants and their respective transmission mechanisms.

Literature Review and Propositions

Government Consumption and Public Debt

Government consumption is directly connected to the fiscal position because persistent increases in current expenditure can widen financing requirements when revenue does not keep pace. The conventional expectation is therefore a positive relationship between government consumption and public debt.

However, recent evidence cautions against treating this relationship as automatic. Ciaffi et al. (2024) find that the composition of spending matters and report stronger sustainability effects from government investment than consumption expenditure. Leão & Leão (2025) similarly

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show that fiscal expansion can improve the medium-term debt ratio when unused capacity allows output to respond strongly. These findings suggest that the debt effect depends on financing, economic conditions and the productive return of expenditure.

Proposition 1 (P1): Government consumption is positively associated with public debt when expenditure growth exceeds the government's capacity to finance it through revenue and productive fiscal returns.

Military Expenditure and Public Debt

Military expenditure creates a fiscal trade-off because higher defence allocations compete with other public priorities. When governments finance a defence buildup through deficits, the additional expenditure can translate into higher debt. Fund (2026) estimates that a typical defence-spending boom increases defence outlays by about 2.7 percentage points of GDP, with roughly two-thirds financed through higher deficits, and that public debt rises by about 7 percentage points of GDP within three years of the start of the buildup. Makun (2024) reports a significant long-run nonlinear association between defence expenditure and public debt, while Okwoche and Nikolaidou (2024) find that military spending has a positive effect on external debt, although its effect differs across debt components.

Proposition 2 (P2): Military expenditure is positively associated with public debt when additional defence spending is financed through fiscal deficits or borrowing.

Economic Growth and Public Debt

Economic growth affects debt through government revenue, debt-servicing capacity and the denominator of the debt-to-GDP ratio. Higher economic activity can strengthen the revenue base and make a given debt stock easier to sustain. Patel & Peralta-Alva (2024) find that GDP growth shocks and related macroeconomic movements explain about 40% of annual variation in debt-to-GDP ratios across 17 advanced economies. At the same time, the relationship can be reversed because high debt may weaken investment and raise risk premia. Accordingly, growth is treated here as an independent determinant for conceptual purposes, while acknowledging the possibility of reverse causality in future empirical research.

Proposition 3 (P3): Economic growth is negatively associated with public debt through its effects on government revenue, debt-servicing capacity and the debt-to-GDP ratio.

Corruption and Public Debt

Corruption may affect public debt indirectly by reducing the efficiency with which public resources are collected and spent. Weak procurement controls, leakage and poor accountability can increase the cost of public programmes and reduce the economic return from debt-financed expenditure. Cooray & Özmen (2024) using 54 EU and non-EU countries over 2010–2022, find that institutional effects vary across the distribution of government debt and report a significant debt-reducing effect associated with corruption control in their EU sample. Aman-Ullah et al. (2024) also emphasise institutional quality in explaining high public debt and fiscal management.

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Proposition 4 (P4): Higher corruption may be associated with higher public debt through weaker fiscal governance, lower expenditure efficiency and reduced accountability, although the relationship may vary across institutional and fiscal contexts.

Climate Risk and Public Debt

Climate risk is the emerging determinant in the framework and includes physical risk from climate-related disasters and transition risk associated with decarbonisation. Both can affect the fiscal conditions underlying debt sustainability, although their timing and transmission mechanisms differ. Physical shocks can damage infrastructure, reduce production and tax revenue, and create immediate relief and reconstruction expenditure. Soyres et al. (2026) estimate that a one-percentage-point increase in disaster-related losses as a share of GDP raises sovereign-default odds by approximately 2–3%. Romagnoli & Santini (2025) further show that climate risk is reflected in sovereign borrowing costs. Transition risk can generate public expenditure through investment, subsidies and adjustment support. Garcia-Macia et al. (2024) shows that fiscal costs during the climate transition depend on policy design, while Seghini (2026) links physical and transition risks to growth, primary balances and real rates. Baret & Menuet (2024) also show that fiscal rules and the financing of environmental expenditure affect the interaction between fiscal and environmental sustainability. An additional concern is feedback. Zenios (2024) and Volz et al. (2024) describe a potential climate-sovereign debt doom loop in which climate shocks worsen fiscal conditions while high debt reduces the resources available for adaptation.

Proposition 5 (P5): Higher climate risk is positively associated with public debt through disaster-related fiscal costs, weaker economic activity, reduced revenue capacity, transition expenditure and higher sovereign borrowing costs.

Integrated Conceptual Framework

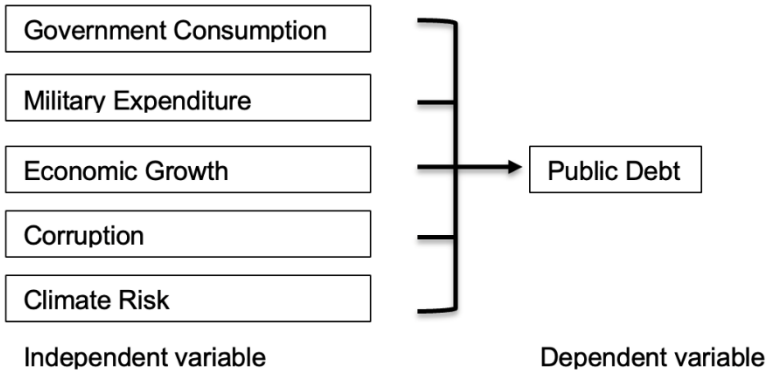
The five determinants are grouped into four analytical dimensions. Government consumption and military expenditure represent the fiscal dimension; economic growth represents the economic dimension; corruption represents the institutional dimension; and climate risk represents the environmental dimension. The grouping is intended to clarify the different routes to debt rather than to imply that the dimensions operate independently.

Table 1. Proposed Transmission Mechanisms Linking the Determinants to Public Debt

Dimension	Independent Variable	Main Transmission Mechanism to Public Debt
Fiscal	Government consumption	Current expenditure, financing gaps and borrowing requirements
Fiscal	Military expenditure	Defence spending and deficit financing
Economic	Economic growth	Revenue capacity, debt-servicing capacity and debt-to-GDP denominator
Institutional	Corruption	Resource leakage, expenditure inefficiency and weak accountability
Environmental	Climate risk	Disaster losses, reconstruction, output effects, transition costs and sovereign risk premia

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Figure 1. **Proposed**



Integrated Conceptual Framework

The framework presents the proposed direct relationships between the five determinants and public debt. The potential interactions between climate risk and fiscal, economic and institutional conditions are identified as important contextual considerations for future empirical investigation, rather than as formally specified moderating effects in the present framework.

The framework does not assume that all five coefficients will be identical across settings. Government expenditure may be more debt-increasing when it is consumption-oriented and deficit-financed, whereas productive investment may strengthen future fiscal capacity. Similarly, the climate-risk effect may be larger where debt levels are already high, or adaptation capacity is weak. The propositions therefore identify expected mechanisms while leaving the magnitude and conditional nature of the relationships to future empirical testing.

Research Gap and Conceptual Contribution

The first gap is one of integration. Existing studies provide substantial evidence on fiscal expenditure, growth, governance and climate-related sovereign risk, but these strands are often examined separately. A framework that places them together can better represent the fact that a fiscal shock may originate outside the fiscal sector and then pass through growth, revenue and financing conditions.

The second gap concerns climate risk. Conventional public-debt models have historically concentrated on deficits, expenditure and growth, while climate-related risks have only recently become prominent in sovereign-debt research. Recent evidence now shows that climate shocks can affect not only expenditure but also output, revenue, sovereign spreads and default risk (Romagnoli & Santini, 2025; Seghini, 2026; Soyres et al., 2026).

The third gap concerns mechanisms and conditionality. The literature does not support a universal effect for every determinant. Government spending may improve debt sustainability under some conditions; defence spending may have nonlinear effects; growth and debt may influence each other; and climate vulnerability may generate stronger fiscal effects when debt and exposure are already high. The present framework addresses this issue by making the transmission mechanisms explicit and by treating the propositions as conditional relationships rather than unconditional laws.

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The conceptual contribution of this paper lies not merely in integrating five determinants of public debt, but in highlighting the conditions under which their relationships with public debt may vary. In particular, the framework emphasises the potential interaction between climate risk and fiscal capacity, economic growth and institutional quality in shaping public debt dynamics. Climate-related shocks may generate greater debt pressures when fiscal capacity is limited, economic growth is weak or institutional quality constrains the effective allocation of public resources. By bringing these conditions into a single conceptual framework, the paper extends conventional explanations of public debt and provides a basis for future empirical research examining the conditional and potentially nonlinear relationships between climate risk and debt sustainability.

Discussion

The proposed framework broadens the discussion of public debt from a narrow deficit perspective to a system of interacting fiscal, economic, institutional and environmental pressures. The fiscal variables capture decisions that directly affect expenditure, while growth and institutions influence the capacity to finance and use those resources. Climate risk can affect several parts of the system simultaneously.

The framework also highlights why empirical results may differ across countries. A government with strong revenue capacity may accommodate higher expenditure without a large increase in debt, whereas a government with weak institutions or high borrowing costs may experience a much larger debt response. This conditionality is consistent with evidence on government spending, defence expenditure and institutional quality (Ciaffi et al., 2024; Cooray & Özmen, 2024; Makun, 2024).

Climate risk is particularly distinctive because it can create a sequence of effects rather than a single effect: a disaster can damage output, reduce revenue, increase reconstruction expenditure and worsen market perceptions of sovereign risk. If debt is already elevated, limited fiscal space may reduce adaptation investment and increase future vulnerability. This potential feedback provides a rationale for including climate risk alongside conventional debt determinants rather than treating it as an unrelated environmental issue.

Implications

Theoretical Implications

The framework combines established fiscal and economic explanations with an emerging climate-fiscal perspective. It shows how expenditure decisions, growth, institutions and environmental shocks can be connected through common debt-sustainability mechanisms. It also accommodates nonlinear and context-dependent effects, which is consistent with recent findings on defence expenditure and climate vulnerability.

Policy Implications

The framework suggests that debt management should focus on the quality and financing of expenditure rather than expenditure size alone. Defence spending should be incorporated into medium-term fiscal planning, while productive investment should be protected where it strengthens future fiscal capacity. Governance reforms, procurement controls and transparency

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can improve the fiscal return from public spending. Climate-risk assessment should also be incorporated into debt-sustainability analysis because disaster response and transition policies can create future financing requirements.

Implications for Future Research

The propositions can be examined using time-series or panel data. Future studies should define consistent measures for each determinant and consider the possibility of endogeneity, particularly between economic growth and public debt. Climate risk may be measured through disaster losses, physical risk indicators, climate vulnerability indices or transition risk measures.

Future empirical work could also test nonlinearities and interactions. For example, institutional quality may moderate the relationship between climate risk and public debt, while the effect of military expenditure may become stronger at high debt levels. These extensions would move the framework beyond a simple linear specification.

Conclusion

Public debt is influenced by a combination of fiscal decisions, economic performance, institutional quality and environmental shocks. This conceptual paper integrates five determinants - government consumption, military expenditure, economic growth, corruption and climate risk - within a single framework.

The literature indicates that government consumption and military expenditure can increase borrowing pressures when expenditure is deficit-financed, while economic growth can strengthen revenue capacity and reduce the relative burden of debt. Corruption may increase fiscal costs through weaker governance. Most importantly, recent climate-sovereign research shows that climate risk can affect debt through several channels, including disaster losses, reconstruction expenditure, weaker output, lower revenue, transition costs and higher sovereign borrowing costs.

The contribution of the framework lies in bringing these conventional and emerging determinants together while recognising that their effects are conditional. The paper therefore provides a basis for future empirical research that can test the direction, magnitude and nonlinear nature of the proposed relationships.

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