When Does Debt Hinder Growth? Threshold Effects of External Borrowing in Sub-Saharan Africa

by

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Abstract

The relationship between external debt and economic growth has long attracted scholarly debate, yet the precise threshold at which debt becomes harmful remains underexplored, particularly in Sub-Saharan Africa. Previous studies largely emphasised linear relationships, overlooking the possibility of nonlinear dynamics in the debt–growth nexus. This study aimed to examine the nonlinear impact of external debt on economic growth in SSA, with the specific objective of identifying the debt threshold beyond which borrowing turns detrimental. Using the Dynamic Panel Threshold Model and data spanning 1996–2023 across SSA countries, the study estimated regime-specific effects of external debt while accounting for growth persistence and macroeconomic fundamentals. The results revealed a clear threshold effect at 60.07% of GDP. When external debt remained below this level, its negative impact on growth was weak and statistically insignificant, implying that moderate borrowing could complement domestic resources under sound fiscal management. However, once debt exceeded the threshold, its adverse effect became strong and statistically significant, consistent with the debt overhang hypothesis. At high debt levels, fiscal space contracted, productive investment declined, and growth determinants such as capital formation, labour, and human capital weakened. The study concluded that external debt supports growth in SSA only within sustainable limits but acts as an impediment once thresholds are breached. To address slow growth, persistent fiscal deficits, and rising debt burdens, policymakers must strengthen debt management frameworks, enhance domestic revenue mobilisation, and allocate borrowed funds to productive and growth-enhancing sectors.

Keywords: External debt, Economic growth, Debt threshold, Debt overhang, Sub-Saharan Africa

JEL Codes: H65, O55, F34

1. Introduction

The relationship between external debt and economic growth continues to generate considerable debate in economic research, particularly in developing economies. These countries frequently face weak revenue mobilization, low domestic savings, persistent budget deficits, and widening trade imbalances, which restrict their ability to finance growth internally. To close this financing gap, many governments rely heavily on external borrowing to fund infrastructure, support productive investment, and stabilize foreign reserves. While such borrowing may provide short-term relief,

its long-term sustainability remains uncertain. Ndung'u et al. (2021) observed that the growing debt burden in developing countries has intensified concerns about its potential to undermine stability and future growth prospects.

Economic theory reflects this tension. The Harrod-Domar model emphasized the growth-enhancing role of external borrowing, argued that additional resources stimulate capital accumulation and productivity when directed toward productive sectors such as agriculture, education, health, and manufacturing (Manasseh et al., 2022). Some scholars further suggested that external borrowing may be less disruptive than domestic borrowing, which often crowds out private investment by raising interest rates and destabilising financial markets (Ndung'u et al., 2021; Abotebuno, 2023). However, this optimistic view is conditional on governance quality and institutional strength. Once debt rises beyond a sustainable level, the returns diminish, and growth may be slow (Mehmood et al., 2023; Yusuf & Mohd, 2023).

Furthermore, historical evidence highlighted the persistence of SSA's debt challenges. Between 1990 and 1995, SSA external debt rose from US$176.36 billion to US$235.94 billion, while the debt-to-GDP ratio climbed from 58.21% to 71.95%, peaking at 78.23% in 1994 (Hassan, 2022). By 2013, total debt increased to US$367.51 billion, a 77% rise over the previous decade. The 2008 global financial crisis deepened fiscal pressures, forcing governments to expand borrowing to stabilise their economies. World Bank (2023) data showed that SSA's external debt grew from US$269 billion in 2010 to US$1.141 trillion in 2022, a 76% rise. This expansion imposed heavy repayment costs, as rising debt service reduced fiscal space for health, education, and infrastructure expenditure which are crucial for long-term growth (Kallianiotis, 2022). High repayment burdens also created a cycle of dependence, where borrowing substituted for productivity gains. Krugman (1988) and Furlong (2021) argued that heavy debt servicing diverts resources from investment, worsens resource misallocation, and depresses long-term growth. The literature identified several channels through which debt impedes development, including the debt overhang effect, crowding out, liquidity constraints, and declining productivity (Moallim Hassan, 2022; Manasseh et al., 2022).

Despite large inflows of borrowed funds, economic growth has slowed from an average of over 6 percent in the early 2000s to below 4 percent in 2015, reflecting

commodity price shocks, fragile fiscal institutions, and the rising burden of debt repayments. Countries such as Ghana, Zambia, and Ethiopia demonstrate how debt servicing pressures can constrain development by diverting resources away from productive uses. Persistent low savings and weak domestic revenue mobilization further entrenched dependence on external financing, yet infrastructure gaps and low productivity remained. This paradox, greater borrowing without commensurate growth, underscores the urgency of clarifying the conditions under which debt enhances or hinders economic performance in SSA.

Empirical evidence has produced mixed outcomes on the link between external debt and economic growth in the literature. Some studies (Joshua et al., 2021; Mohsin et al., 2021; Nnubia et al., 2022; Yusuf & Mohd, 2023) found that external borrowing contributes positively to economic growth, while others (Epaphra & Mesiet, 2021; Lau et al., 2022) reported negative effects. Still, other studies (Hilton, 2021; Sharaf, 2022; Yamin et al., 2023) observed no significant relationship. These divergent findings suggest that the debt–growth relationship may not follow a simple linear pattern but could instead depend on the existence of threshold effects.

Against this background, the objective of this study is to examine the nonlinear relationship between external debt and economic growth in SSA and to identify the threshold level of debt that fosters growth without imposing adverse economic consequences. The specific goal is to generate policy-relevant evidence on the debt–growth nexus that can guide fiscal and debt management strategies in the region. This objective is worthy of attention because debt sustainability has emerged as one of the most critical macroeconomic challenges in SSA, where rising debt coincides with slowing growth and widening fiscal pressures. The study tested the hypothesis that external debt supports economic growth up to a threshold, but beyond that level, it becomes detrimental. It also addresses the deficiency in existing research, which has largely focused on linear relationships or single-country analyses, thereby neglecting the nonlinear and regional dynamics of debt (Filippakis & Stamatopoulos, 2021; Sandow et al., 2022). By applying the Dynamic Panel Threshold Model (DPTM) to data from 42 SSA countries between 1996 and 2023, this study provides a more comprehensive analysis of how debt interacts with growth in varying economic conditions.

By identifying the regional threshold at which external debt shifts from being growth-enhancing to growth-reducing, this study contributes to the literature on debt sustainability and helps resolve the policy dilemma of whether external borrowing serves as a driver of growth or a source of macroeconomic fragility in SSA. In doing so, the study provides both theoretical and empirical insights that are valuable for scholars and policymakers alike. To position this study within the broader body of knowledge, the rest of the paper is structured as follows: section two reviewied the theoretical and empirical literature on the debt–growth nexus, highlighting the diverse perspectives and evidence that shape current debates. Section three outlined the methodology, Section four presented and discussed the empirical results, and Section five concluded with policy recommendations.

2. Literature review

In theoretical terms, the debt Laffer curve and Harrod-Domar growth theory, demonstrated that while external borrowing could provide short-term support for growth, excessive debt accumulation undermined investment, constrained fiscal space, and weakened long-term growth prospects. The debt Laffer curve, introduced by Sachs (1989), provided a useful framework for examining the nonlinear effects of external debt on growth. It suggested that when borrowing remained within manageable levels, it supported investment and growth. However, once debt exceeded a critical threshold, its marginal effect turned negative. Krugman (1988) formalised this idea, showing that excessive debt functioned like a tax on the economy.

Furthermore, heavy taxation of domestic resources to meet debt service discouraged private investment and slowed growth. Reinhart and Rogoff (2010) confirmed this nonlinearity, arguing that debt could stimulate growth at low levels but crowd out productive activity once it rose too high. For SSA, this theory highlighted the importance of identifying a sustainable debt threshold, given the region's heavy reliance on external borrowing. The Harrod-Domar submission placed savings and investment at the center of economic growth. It argued that external debt could close financing gaps when domestic savings were inadequate, thus accelerating capital accumulation and growth. Yet, the debt overhang hypothesis warned that when obligations became excessive, investors lost confidence. Fears of future taxation,

inflation, or devaluation reduced incentives for both domestic and foreign investment. The crowding-out effect reinforced this argument. High debt service obligations forced governments to allocate scarce revenues to creditors rather than to development priorities such as infrastructure, education, and health thereby limiting long-term growth. Similarly, the liquidity constraint hypothesis stressed the challenges faced by economies with low export earnings and limited reserves. In such cases, countries often resorted to currency devaluation to meet debt obligations, a policy that could fuel inflation and exchange rate instability. The factor productivity growth compression hypothesis further explained how high debt burdens shifted investment away from long-term productive activities toward short-term instruments, reducing efficiency and hampering structural transformation.

For SSA, these central theoretical implications has called for the urgent need to balance external borrowing with sustainable debt management in order to achieve long-term economic development. This nonlinearity underscored the relevance of this empirical study that examined how external debt affected economic growth outcomes in the region. The next section reviewed the existing literature to evaluate the extent to which these theoretical predictions held true in SSA and to identify the gaps that this study aimed to fill.

The link between external debt and economic growth has attracted wide attention from researchers and policymakers over the years. This interest reflected the fact that many developing countries, especially in SSA, relied heavily on borrowing from abroad to support their development needs. However, the influence of such borrowing on growth varied across countries in the literature. These variations in the results suggested that the relationship between debt and growth may not be simple or direct, and that the effect of debt may depend on how much a country borrows and how it used the borrowed funds.

While some research confirmed that external debt could stimulate growth when managed effectively (Ibhagui, 2018; Kengdo et al., 2020; Okwoche, 2021), others showed that excessive debt reduces long-term growth prospects (Makun, 2021; Mohsin et al., 2021; Senadza et al., 2017, 2018; Kumar & Woo, 2010; Hassan & Meyer, 2021; Yasar, 2021; Le Hong & Trinh, 2022; Hassan, 2022; Agyeman et al., 2022; Seyram et al., 2019; Manasseh et al., 2022). A third strand of the literature

found a nonlinear relationship, suggesting that debt promotes growth up to a threshold, after which it becomes harmful (Ehigiamusoe & Lean, 2020; Ndoricimpa, 2020; Edo et al., 2020; Ali et al., 2021; Tarawalie & Jalloh, 2021; Law et al., 2021; Sharaf, 2022; Makun, 2021).

Studies employing threshold analysis provided important methodological contributions by identifying debt levels beyond which growth declines. For example, Ehigiamusoe and Lean (2020) employed Panel Mean Group (PMG) and Mean Group (MG) estimators in West Africa and found debt and fiscal deficits harmful beyond thresholds of 48.6% and -13.5% of GDP. Similarly, Ndoricimpa (2020) applied a Panel Smooth Transition Regression (PSTR) approach and showed that while low debt is growth-neutral, higher debt becomes harmful, with thresholds ranging from 58% to 66% of GDP depending on country type. These findings highlight that the impact of debt is conditional on its magnitude.

Other regional evidence reinforced this nonlinear argument. Ali et al. (2021) examined South Asia using GMM and OLS and reported that debt did not immediately threaten stability but showed risks if debt levels rose. Tarawalie and Jalloh (2021) identified an optimal debt threshold of 111% of GDP in ECOWAS countries, beyond which growth weakened. Likewise, Sharaf (2022) found a negative long-run effect in Egypt with a debt threshold of 96.7%, supporting the debt overhang hypothesis. Methodologically, these studies advanced the field by adopting nonlinear estimators such as ARDL, PSTR, and NARDL, which captured asymmetries and threshold effects more effectively than linear models.

In SSA, studies showed further evidence linking excessive debt to slow growth. For instance, Kengdo et al. (2020) found that debt enhanced growth across sub-regions when within sustainable levels, while Okwoche (2021) supported the Debt Laffer Curve hypothesis by showing a nonlinear relationship between debt and growth. Edo et al. (2020) demonstrated that the positive short-term effect of debt turned negative in the long run, underscoring structural vulnerabilities. Hassan (2022) and Agyeman et al. (2022) emphasised that governance failures and capital flight amplified debt's negative effects. Seyram et al. (2019) and Manasseh et al. (2022) further confirmed the negative impact of debt but stressed the role of weak institutions in shaping these outcomes.

The literature established that external debt could either stimulate or constrain growth, depending on its scale, management, and the broader structural context, including governance, fiscal discipline, and capital flight in SSA. Methodological advances, particularly nonlinear models, revealed possible threshold effects, yet most studies did not clearly identify the precise level at which debt becomes harmful. This omission left policymakers without clear guidance on when borrowing shifts from supporting to undermining growth. Addressing this gap is essential for SSA economies, where rising debt and persistent fiscal challenges demand evidence-based strategies for sustainable borrowing and long-term development.

3. Methodology

This study investigated the effect of external debt on economic growth and identified its threshold level using the Dynamic Panel Threshold Model (DPTM) developed by Kremer et al. (2013) and extended by Seo and Shin (2016). The analysis covered panel data from 42 SSA countries over a 27-year period (1996–2023). The DPTM was particularly appropriate for this study because it captured the nonlinear relationship between external debt and growth in SSA economies. By distinguishing between regimes where debt remained below or exceeded a critical threshold, the model provided deeper insights into how borrowing affects growth. It also incorporated dynamic effects and controlled for endogeneity, ensuring that past economic conditions did not bias the estimates. The model was specified as follows:

$$Y_{it} = \varphi_i + \beta Y_{i,t-1} + \gamma_1 P_{i,t} I(P_{it} \leq \emptyset) + \gamma_2 P_{i,t} I(P_{i,t} > \emptyset) + \omega_1 X_{i,t} + \pi_t + \varepsilon_{it} \tag{1}$$

In this model, economic growth served as the dependent variable (Y_{it}), while country-specific effects were treated separately to account for heterogeneity across SSA economies. The long-run impact of external debt on growth was represented by two distinct coefficients: one applied when external debt remained below the threshold ($(P_{it} \leq \emptyset)$) and the other when it exceeded this critical level ($P_{i,t} > \emptyset$). The threshold variable, together with regime-dependent regressors, determined how growth responded to varying debt levels. The inclusion of a common cross-sectional regime constant and an indicator function distinguished between the two regimes. The semi-log linear specification of the model was expressed as:

$$ln\_gdppc_{it} = \alpha_0 + \alpha_1\,edt_{it} + \alpha_2\,ln\_fdt_{it} + \alpha_3\,edt_{it}\mathrm{I}(edt_{it} > \gamma) + \alpha_4\,ln\_gfcf_{it} + \alpha_5\mathrm{h}cs_{it} +$$
$$\alpha_6\mathrm{ln}\_gexp_{it} + \alpha_7\,lfc_{it} + \alpha_8\,ln\_savs_{it} + \varphi_{it} + \varepsilon_{it} \qquad\qquad (2)$$

Where $ln\,gdppc_{it}$ is the log of *gdp* per capita; edt_{it} is the total borrowing a country owes to foreign creditors, payable in foreign currency*; lnfdt_{it}* is the log of fiscal deficits, it occur when a government's expenditures exceed its revenues, resulting in a budget shortfall; $lngfcf_{it}$ is the log of gross fixed capital formation; $lngexp_{it}$ is the log of government expenditure refers to the total amount of money spent by the government on goods and services, including public services, infrastructure, education, healthcare, defense, and social welfare programmes*;* hcs_{it} represents human capital stock which is the collective skills, knowledge, and abilities within a population driving productivity (as percentage of school enrollment rates at primary, secondary, and tertiary levels)*; lfc_{it}* is the labour force and it represents the human factor in producing the goods and services. Industries depend heavily on the availability of skilled and vibrant labour that will assist in transforming the raw materials into finished products. Labour forces participation rate's total (per cent of total population ages 15+) was employed as proxy for labour force. And log of savings, *lnsav_{it}* refers to the portion of income not spent on current consumption and is set aside for future use, either as deposits, investments, or reserves, calculated by subtracting total consumption from total GDP. Also,*t* represents the period and *i* stands for country respectively. α_0 is constant, while α_1 is the coefficient independent variable and $\alpha_2, \alpha_3, \alpha_4, \alpha_5$ *,and* α_6 are the coefficients of the explanatory variables, and ε_{it} represent the stochastic term/disturbance term.

4. Results and discussion

The study reported descriptive statistics to summarise the distribution of variables and a correlation matrix to assess associations and potential multicollinearity. These measures ensured data quality, provided preliminary insights into relationships, and strengthened the reliability of the econometric analysis.

Table 1: Summary of Descriptive Statistics

Variables	Mean	Max	Min	Std. Dev.
GDPPC	7.059	9.301	5.569	0.870
EDT	53.085	358.803	3.895	43.995
GEXP	22.837	26.628	3.651	2.516
GFCF	21.341	26.276	17.410	1.569
HCS	98.302	151.726	27.457	22.891
LFC	54.948	134.919	47.286	6.363
SAVS	1.939	4.441	-5.843	1.717

Note: external debts, *edt*; fiscal deficits, *fdt*; government expenditure, *gexp*; gross fixed capital formation, *gfcf*; Human capital Stock, *hcs*; labour force, *lfc* and savings, *savs*.

Source: Author's Compilation (2025)

Table 1 presents a summary of key economic indicators for countries in SSA, providing a broad view of their economic structures and performance. The average GDP per capita is 7.059, with values ranging from 5.569 to 9.301, suggesting moderate and relatively stable growth across the region. External debt as a percentage of GDP shows a mean of 53.085%, but with considerable variation, from a low level of 3.895% to a high level of 358.803%, indicating that while some countries maintain manageable debt levels, others faced substantial debt burdens. Government expenditure, which reflects fiscal commitment to public goods and services, averages 22.837% of GDP. However, it ranges widely from 3.651% to 26.628%, pointing to significant differences in public spending strategies. Gross fixed capital formation, representing investment in infrastructure and productive assets, has a relatively stable mean of 21.341%, with values between 17.410% and 26.276%.

Human capital, measured through education and health indicators, shows a mean value of 98.302, but ranges broadly from 27.457 to 151.726, revealing disparities in

human capital development across countries. The labour force participation rate averages 54.948% of the population, with a span from 47.286% to 134.919%, reflecting variation in workforce engagement and demographic structures. Finally, gross domestic savings as a percentage of GDP are notably low, with an average of 1.939%, a maximum of 4.441%, and a minimum of -5.843%, highlighting challenges in mobilizing domestic resources for investment. The high standard deviation further reflected instability and uneven debt management across the region. These figures implied that external debt could support growth when moderate but become harmful when excessive, reinforcing the need to identify the threshold at which debt begins to constrain economic performance in SSA.

Table 2: Results of Correlation Matrix Coefficients

	gdppc	edt	gexp	gfcf	hcd	lfc	savs
gdppc	1.000						
edt	-0.085	1.000					
lgexp	0.082	-0.131	1.000				
lgfcf	0.382	-0.170	0.556	1.000			
hcs	0.233	-0.222	0.121	-0.007	1.000		
lfc	0.570	-0.032	-0.486	0.109	0.127	1.000	
savs	0.403	-0.084	0.169	0.508	-0.050	0.078	1.000

Note: GDP per capita (*gdppc*) and independent variables - external debt (edt), and control variables, including gross fixed capital formation (gfcf), government expenditure (gexp), human capital stock (hcs), labor force (lfc), and savings (savs)
Source: Author Compilation (2025)

The correlation matrix in Table 2 indicated the absence of perfect correlation among the variables, with correlation coefficients ranging from -0.007 to 0.570, all remaining below the critical 0.80 threshold. Following the criteria outlined by Reddy and

Balasubramanyam (2021) and Davino et al. (2022), this low correlation suggestd that multicollinearity is not a concern among the regressors, thereby enhancing the robustness and reliability of the estimated results.

Table 3: Threshold result

Model	Threshold level	Lower	Upper
Threshold value of edt	60.07**	31.82	88.32
Constant	4.79	2.59	6.99

Variables Dep. Gdppc						
	Coef.	**Std. Err.**	**Z**	**P>z**	**(95% Conf. Interval)**	
Lower regime						
lngdppc-1	0.781***	0.141	5.53	0.000	0.504	1.058
Edt_Below	-0.0023	0.0012	-1.90	0.058	-0.005	0.000
Edt_Above	-0.0016	0.0003	-4.54	0.000	-0.002	-0.001
lnfdt	0.006**	0.002	2.16	0.031	0.005	0.001
lnGexp	-3.830	0.013	-0.00	1.000	-0.026	0.026
lngfcf	0.072**	0.032	2.21	0.027	0.008	0.137
lfc	0.007**	0.002	2.73	0.006	0.002	0.012
lnsav	0.016	0.024	0.68	0.494	-0.031	0.065
hcs	0.002	0.001	0.18	0.857	-0.002	0.002
Upper regime						
lngdppc-1	-0.186**	0.065	-2.83	0.005	-0.315	-0.057
lnfdt	-0.004	0.009	-0.53	0.597	-0.002	0.001
lngfcf	-0.107***	0.028	-3.74	0.000	-0.163	-0.050
lfc	-0.023***	0.004	-5.70	0.000	-0.032	-0.015
lnsavs	0.030	0.033	0.93	0.352	-0.033	0.095
hcs	-0.002	0.001	-0.10	0.918	-0.003	0.003
lngexp	-0.006	-0.013	0.48	0.634	-0.033	0.020

Note: *,** and * represents 1%, 5% and 10% levels of significance respectively.**
Source: Author's Compilation 2025

The threshold analysis identified a critical external debt level of 60.07% of GDP, statistically significant at the 5% level ($p < 0.05$). This confirmed that the effect of

external debt on growth in SSA differed significantly depending on whether debt remained below or exceeded this point. When debt was below the 60.07% threshold, the coefficient of lagged GDP per capita was positive and highly significant (0.781, z = 5.53, p = 0.000), showing strong persistence in growth. This indicated that past economic performance reinforced current growth in this regime. External debt itself carried a negative coefficient (-0.0023), but it was only weakly significant (p = 0.058), suggesting that moderate levels of borrowing did not substantially undermine growth. Fiscal deficits had a positive and significant effect (0.006, z = 2.16, p = 0.031), demonstrating that deficit financing supported economic activity. Gross fixed capital formation also contributed positively (0.072, z = 2.21, p = 0.027), confirming that investment in physical capital enhanced growth. Labour force participation was likewise positive and significant (0.007, z = 2.73, p = 0.006), indicating that expanding the labour base stimulated output. In contrast, government expenditure carried a negative coefficient (-3.830) but was insignificant (p = 1.000), suggesting that spending did not translate into productive outcomes. Domestic savings (0.016, p = 0.494) and human capital (0.002, p = 0.857) were also statistically insignificant, though their positive signs implied some limited potential contribution under moderate debt levels.

Once external debt exceeded the 60.07% threshold, economic dynamics shifted sharply. Growth persistence turned negative and significant (-0.186, z = -2.83, p = 0.005), indicating reduced stability and weaker momentum in output. The effect of external debt in this regime was negative (-0.0016) but significant, implying that its burden operated more indirectly by weakening other growth drivers. In contrast to the lower regime, gross fixed capital formation now displayed a negative and highly significant effect (-0.107, z = -3.74, p = 0.000), reflecting diminishing returns to investment when debt levels were excessive. Labour force participation also became strongly negative (-0.023, z = -5.70, p = 0.000), showing how rising debt slowed job creation and reduced productivity in highly indebted economies. Savings remained positive (0.030) but insignificant (p = 0.352), showing that its stabilising role weakened under high debt conditions. Human capital, which was slightly positive below the threshold, turned negative (-0.002, p = 0.918), suggesting that education and health were undermined by inefficiencies or underfunding in heavily indebted

settings. Government expenditure also remained negative (-0.006) and insignificant (p = 0.634), consistent with persistent inefficiencies in fiscal management.

Collectively, these results demonstrated that SSA economies benefited from fiscal deficits, capital investment, and labour force expansion only when external debt remained below the 60.07% threshold. Beyond this level, these same growth drivers lost their effectiveness or became harmful, highlighting the destabilising effects of excessive borrowing and underscoring the importance of maintaining debt at sustainable levels to safeguard long-term growth in SSA countries.

The study revealed a critical external debt threshold of 60.07% of GDP, beyond which economic growth in SSA declined significantly. This established a nonlinear relationship between debt and growth: at moderate levels, external borrowing supported output, but once it exceeded the threshold, it became detrimental. Below this limit, the negative effect of debt was weak and only marginally significant, suggesting that carefully managed borrowing could complement domestic resources in financing productive activities. This outcome aligned with the Debt Overhang Hypothesis (Krugman, 1988; Sachs, 1989), which contends that debt can stimulate growth if invested in infrastructure, industry, and human capital.

However, when debt levels crossed the threshold, the adverse effect on growth became strong and statistically significant. The findings supported the Debt Laffer Curve, which argued that beyond a sustainable point, the cost of servicing debt diverts scarce fiscal resources away from productive sectors, thereby reducing investment and weakening growth potential (Yusuf & Mohd, 2021; Gill & Pinto, 2005). This findings aligned with the economic realities of some SSA countries such as Ghana, Zambia, and Ethiopia, where excessive borrowing led to debt distress, currency instability, and reduced public investment. The evidence indicated that high debt burdens constrained fiscal space, crowded out essential social spending, and heightened macroeconomic vulnerabilities (Chandia et al. 2022; Olaoye & Alabadan, 2024; Were, 2024).

The results also showed that the negative impact of external debt extended beyond direct effects on economic growth to interactions with other growth determinants. Once debt surpassed the threshold, the efficiency of investment deteriorated, with

gross fixed capital formation shifting from growth-enhancing to strongly negative. Similarly, labour force participation turned to an additional burden on growth performance implying reduced employment opportunities and declining productivity, as fiscal resources were increasingly allocated to debt service. Human capital investment also weakened, implying that debt distress undermined education and health financing, thereby eroding the long-term foundations of growth. These dynamics highlighted a vicious cycle in which rising debt burdens constrained economic growth, and slower growth further hindered the region's ability to manage or meet debt obligations.

Furthermore, the findings showed that external borrowing at sustainable levels could enhance growth, but excessive debt accumulation reversed these gains. The statistical significance of the results confirmed that debt beyond 60.07% of GDP consistently depressed growth across SSA. This supported the broader conclusion that debt-financed expansion must be carefully balanced against sustainability concerns, since excessive borrowing imposed structural constraints that undermined fiscal stability and long-term development prospects.

5. Conclusion and Recommendations

This study examined the nonlinear relationship between external debt and economic growth in SSA, with the primary objective of identifying the threshold beyond which debt becomes detrimental. The results revealed a critical debt-to-GDP threshold of 60.07%, below which the negative effect of debt on growth remained weak and marginally significant, but above which the effect turned strongly negative and statistically significant. This outcome confirmed that while moderate borrowing can complement domestic resources and stimulate productive investment, excessive external debt imposes a binding constraint on growth by diverting scarce fiscal resources away from development priorities. The findings aligned with the Debt Overhang Hypothesis and the Debt Laffer Curve theory, which argue that high debt burdens discourage investment and weaken growth potential. Importantly, the study

showed that when debt exceeded the threshold, the productivity of other key growth drivers, capital formation, labour force participation, and human capital are hindered, amplifying their negative impact on economic growth. This reflected the structural challenges of several SSA economies, where debt distress, reduced fiscal space, and macroeconomic instability eroded long-term development prospects.

By establishing a precise debt threshold specific to SSA, this research advanced knowledge beyond earlier studies that offered broad or generalised estimates. It contributed to the literature by demonstrating how external debt not only directly suppresses growth but also undermines the effectiveness of critical growth-enhancing variables when the threshold is exceeded. Additionally, by incorporating fiscal deficits and other macroeconomic controls variables, the study provided a more comprehensive framework for understanding the debt-growth nexus in the region. These insights filled an important gap in SSA's empirical literature and offered a practical benchmark for both scholars and policymakers. From these findings, the following conclusions can be drawn. First, external debt can be a useful development tool when maintained within sustainable limits, but once it surpasses the threshold of 60.07% of GDP, it becomes a drag on growth and development. Second, excessive debt creates structural distortions that reduce the effectiveness of capital, labour, and human capital in driving long-run growth.

The findings underscored that external debt exerted adverse effects on growth only when it exceeded the identified threshold, while fiscal discipline moderated these negative outcomes. Consequently, the policy implications were evident. SSA governments needed to strengthen debt management frameworks to maintain borrowing within sustainable limits, channel loans toward projects with demonstrable economic returns, and avoid the build-up of non-productive debt. At the same time, policymakers had to enhance domestic revenue mobilization, enforce fiscal discipline, and improve the efficiency of public expenditure to reduce overreliance on external borrowing. Such measures would allow SSA economies to harness the growth-enhancing potential of debt while avoiding the vicious cycle of debt distress and economic stagnation.

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