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Impact of Public Debt on Economic Growth in Nigeria: Evidence from Autoregressive Distributed Lag Model

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ABSTRACT: This paper examined the impact of public debt on economic growth in Nigeria from 1990 to 2023. The objectives are to determine the impact of domestic debt, external debt and public debt service payments on gross domestic product (GDP) in Nigeria. The Augmented Dickey-Fuller unit root test indicates that the variables are stationary at levels, I(0) and at order one, I(1). The study applied the autoregressive distributed lag (ARDL) model to secondary data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS), and Debt Management Office (DMO). The ARDL bounds test to cointegration indicates existence of a long-run relationship among the variables which led to estimation of both short-run and long-run results. Findings reveal that domestic debt and external debt made negative and insignificant impact on GDP whereas public debt service payments made positive and significant impact on GDP in both the short-run and the long-run. Control variables of gross fixed capital formation, total labour force participation rate and inflation rate produced mixed results in both periods. This suggests that Nigeria's reliance on public debt-both domestic and external borrowings has been detrimental to its economic performance, primarily due to mismanagement of borrowed funds. The paper recommends that public debt should be productively utilized, there should be reforms in debt management to ensure efficient allocation of borrowed funds to productive sectors, and a reduction in reliance on external financing to achieve sustainable economic growth and development.

KEYWORDS: Public debt, internal debt, external debt, debt service payments, ARDL, Nigeria

1. INTRODUCTION

The relationship between public debt and economic growth has been a subject of extensive debate in economic literature, particularly in developing countries like Nigeria. This complex interplay has attracted significant attention from economists, policymakers, and researchers alike, as nations strive to balance their development needs with fiscal sustainability. As countries pursue economic advancement, they often resort to borrowing, both domestically and externally, to finance various projects and stimulate economic growth. However, the impact of such debt on economic performance remains a complex and contentious issue, with various studies presenting conflicting findings (Akhanolu et al., 2018; Reinhart & Rogoff, 2010). The debate surrounding public debt and economic growth has its roots in classical economic theory, with scholars like Adam Smith and David Ricardo discussing the potential effects of government borrowing on national wealth. In recent decades, this discussion has intensified, particularly following the global financial crisis of 2008, which led to substantial increases in public debt levels across many countries (Panizza & Presbitero, 2014). Nigeria, as Africa's largest economy, presents a compelling case study for examining the debt-growth nexus. The country has experienced significant fluctuations in its debt profile over the years, reflecting its complex economic history and development challenges. Nigeria's debt journey can be traced back to the 1970s when the country began to borrow heavily to finance ambitious development projects. The subsequent oil boom and bust cycles, coupled with political instability and economic mismanagement, led to a debt crisis in the 1980s and 1990s (Omotola & Saliu, 2009).

In recent years, Nigeria's debt stock has grown substantially, with both domestic and external debts playing crucial roles in shaping its economic landscape. According to the Debt Management Office (2022), Nigeria's total public debt stock stood at ₦41.60 trillion ($100.07 billion) as of March 2022, with domestic debt accounting for 60.1% and external debt 39.9% of the total debt stock. However, by December 31, 2023, Nigeria's total public debt stock had risen to ₦97,340,708.25 trillion ($108,229.34 billion) with total external debt accounting for ₦38,219,849.44 trillion (39.26%) while domestic debt accounted for ₦59,120,858.81 trillion (60.74%). Within the same period, the GDP grew by 2.74% in 2023 relative to 3.10% in 2022 (WDI, 2023) indicating

significant drop. This significant increase in debt levels has raised concerns about debt sustainability and its implications for long-term economic growth. The composition of Nigeria's debt portfolio is noteworthy, with a shift towards more domestic borrowing in recent years. This shift has been partly motivated by efforts to reduce exposure to external shocks and currency risks. However, it has also led to concerns about the potential crowding-out effect on private sector investment, as government borrowing may compete with private sector credit (Adegbite et al., 2016). While debt can provide necessary capital for investment in infrastructure, education, and other growth-enhancing sectors, its effectiveness in promoting economic growth depends on various factors, including the efficiency of resource allocation and the overall macroeconomic environment. In Nigeria, questions have been raised about the productive use of borrowed funds and their translation into tangible economic outcomes (Ugwuanyi et al., 2017).

The relationship between public debt and economic growth is a complex and multifaceted issue that has significant implications for developing economies like Nigeria. While debt financing can potentially drive economic growth by providing resources for investment in infrastructure, human capital, and other productive sectors, excessive debt accumulation may have detrimental effects on economic performance (Égert, 2015). High levels of public debt can lead to increased debt servicing costs, crowding out of private investment, and reduced fiscal space for essential public expenditures, potentially creating a debt overhang that hinders economic growth (Adegbite et al., 2020; Reinhart & Rogoff, 2010). In Nigeria, the rapid increase in public debt, both domestic and external, has raised concerns about its sustainability and impact on economic growth. The country's debt-to-GDP ratio has been on an upward trajectory, reaching 35.51% in 2021 (World Bank, 2022). This trend continued, with Nigeria recording a government debt to GDP of 38.80% of the country's gross domestic product in 2023. Historical data shows that government debt to GDP in Nigeria averaged 33.83% of GDP from 1990 until 2023, reaching an all-time high of 75% of GDP in 1991 and a record low of 7.30% of GDP in 2008 (Trading Economics, 2023). This significant fluctuation and recent upward trend have sparked debates about the optimal level of debt and its implications for long-term economic development (Omotola & Saliu, 2009).

The rapid accumulation of debt raises questions about debt sustainability and the country's ability to meet its debt obligations without compromising economic stability. High debt servicing costs can divert resources away from critical sectors such as healthcare, education, and infrastructure, potentially undermining long-term growth prospects (Okonjo-Iweala et al., 2003). Furthermore, the risk of debt distress could negatively impact investor confidence and the country's credit ratings, affecting its ability to access international capital markets on favorable terms (Ejigayehu, 2013). Moreover, the quality of institutions in Nigeria presents additional challenges in translating debt into economic growth. Weak institutional frameworks may hinder the effective utilization of borrowed funds, leading to suboptimal outcomes. Issues such as corruption, lack of transparency in public financial management, and inefficient project implementation can undermine the potential benefits of debt financing (Nwannebuike et al., 2020; Presbitero, 2008). The persistence of these institutional weaknesses raises concerns about the efficiency of resource allocation and the overall effectiveness of debt-financed development initiatives (Ajayi & Oke, 2012). The interplay between domestic and external debt, and their respective impacts on economic growth, further complicates the issue. While domestic borrowing may have different implications for the economy than external borrowing, such as reduced exchange rate risk and potential for developing local financial markets, it may also lead to crowding out of private investment (Akhanolu et al., 2018; Panizza, 2008). Conversely, external borrowing can provide access to larger pools of capital but exposes the economy to exchange rate fluctuations and external shocks (Adegbite et al., 2016). The relative effects of these two types of debt on growth in the Nigerian context remain unclear and warrant further investigation. Additionally, the role of institutional qualities in moderating the relationship between debt and economic growth has not been adequately explored in the Nigerian context. Understanding how institutional factors influence the effectiveness of debt in promoting growth is crucial for developing targeted policies to enhance the positive impacts of borrowing while mitigating potential negative effects (Ogbeide-Osaretin & Orhewere, 2020; Presbitero, 2012). Factors such as governance effectiveness, regulatory quality, rule of law, and control of corruption may significantly affect the translation of borrowed funds into productive investments and economic growth (Kaufmann et al., 2011). Furthermore, the global economic landscape, characterized by uncertainties such as fluctuating commodity prices, geopolitical tensions, and the lingering effects of the COVID-19 pandemic, adds to the challenges of managing public debt effectively (IMF, 2021). These external factors can influence both the accumulation of debt and its impact on economic growth, necessitating a nuanced understanding of the debt-growth relationship in the context of global economic dynamics.

There are quite a number of scholars' works (Okeke et al., 2023; Agu et al., 2023; Ogboghro, 2023; Kalu & Boniface, 2023; Yusuf & Mohd, 2023; Olatunji & Akintoye 2024; Oyadeyi, et al., 2024; JO et al., 2024, etc) that have empirically studied the effect or impact of Public debt on economic growth in Nigeria. Many of them studied the impact of either domestic or external debt on economic growth in Nigeria independently only a few did take into account both internal and external debt together and measure its impact on economic growth in Nigeria. Even the few ones that did are not with current data. This work is therefore suited to fill this gap in the literature and contribute to knowledge by assessing the effect of government debt on economic growth in Nigeria with emphasis on external debt, internal debt, and debt service payments.

In light of these identified knowledge gaps, the broad objective of this study is to examine the impact of public debt on economic growth in Nigeria from 1990 to 2023 while the specific objectives are to:

i. Determine the impact of domestic debt on economic growth in Nigeria.

ii. Investigate the impact of external debt on economic growth in Nigeria.
iii. Ascertain the impact of public debt service payments on economic growth in Nigeria.

The remaining of this paper is divided into section 2 literature review, section 3 methodology, section 4 data analysis and discussion, and section 5 conclusion, policy implications and recommendations.

2. LITERATURE REVIEW

2.1 Conceptual Literature Review

2.1.1 Concept of Domestic Debt

Domestic debt refers to the borrowing of funds by the government from domestic sources within the country. It includes government securities such as treasury bills, bonds, and other financial instruments issued to individuals, banks, pension funds, and other domestic institutions. Internal debt is distinct from external debt, which involves borrowing from foreign creditors. Internal debt serves as a critical source of financing for governments to meet budgetary requirements, fund development projects, and bridge revenue shortfalls. Internal debt in Nigeria refers to funds borrowed by the government from domestic sources, primarily through the issuance of securities like treasury bills and bonds. While internal debt serves as a crucial financing mechanism for government expenditures and development projects, its impact on the economy can be both positive and negative. On the positive side, internal debt facilitates the financing of essential infrastructure projects, stimulates economic activity, and mobilizes domestic savings for capital formation. However, excessive reliance on internal borrowing can lead to challenges such as high debt servicing costs, crowding out of private sector credit, and inflationary pressures. To manage internal debt effectively, Nigeria needs to implement sound fiscal policies, enhance revenue mobilization, conduct regular debt sustainability analyses, strengthen debt management capacity, and prioritize investments with high economic returns. By adopting prudent debt management practices and promoting transparency, Nigeria can ensure that internal debt contributes to sustainable development and economic growth while mitigating risks to the economy (Rogers, 2021).

2.1.2 Concept of External Debt

External debt is a critical source of financing for developing countries, aiding in funding development projects and addressing fiscal shortfalls (International Monetary Fund, 2013). While it serves as a mechanism for accessing capital from foreign creditors, its management and impact on economic growth are widely debated. External debt encompasses all liabilities owed by a country to foreign creditors, spanning governments, international financial institutions, and private lenders. It funds infrastructure projects, budget deficits, and other investment needs through sovereign bonds, bilateral loans, and commercial borrowing (Lane, & Milesi-Ferretti, 2007). By stimulating productive investments in infrastructure, education, healthcare, and technology, external debt can enhance productivity, attract foreign investment, and foster economic activity, contributing to long-term development. However, external debt also poses significant challenges and risks for developing countries like Nigeria. High debt levels make countries vulnerable to external shocks such as currency fluctuations, interest rate changes, and commodity price volatility, potentially disrupting debt servicing capacity and exacerbating financial vulnerabilities. Additionally, servicing external debt requires a significant portion of the budget, straining government finances and limiting fiscal flexibility, which can lead to the crowding out of essential public services (Reinhart, & Rogoff, 2009). Furthermore, external debt denominated in foreign currencies exposes countries to currency risk, while borrowing at variable interest rates subjects them to interest rate risk, increasing debt servicing costs. Excessive reliance on external borrowing without adequate debt management measures can result in debt distress and default risk, damaging a country's creditworthiness and hindering access to future financing. To maximize the benefits of external debt while mitigating its risks, developing countries must prioritize debt sustainability and effective debt management. This includes implementing sound fiscal policies, conducting regular debt sustainability analyses, strengthening debt management capacity, and diversifying sources of financing. By adopting prudent debt management practices and adhering to sound macroeconomic policies, countries like Nigeria can harness the benefits of external financing while safeguarding fiscal sustainability and promoting long-term development. However, careful attention must be paid to managing debt levels and mitigating risks to ensure that external debt remains a catalyst for progress rather than a source of economic instability (Krugman, & Obstfeld, 2018; UNCTAD, 2016).

2.1.3 Fiscal Policy, Macroeconomic Stability, Economic Growth, Investment and Productivity

Debt accumulation affects fiscal policy choices and macroeconomic stability in Nigeria. Excessive debt levels can strain government finances, leading to budget deficits, inflationary pressures, and currency depreciation. Sound fiscal management, debt sustainability analysis, and prudent borrowing practices are essential for maintaining macroeconomic stability and promoting sustainable economic growth. Fiscal policy, which involves government spending, taxation, and borrowing, plays a vital role in shaping economic growth and stability. It influences aggregate demand, investment, and overall economic activity. Macroeconomics studies the behaviour of economies as a whole, focusing on indicators like GDP growth, inflation, and unemployment.

The impact of domestic and external debt on economic growth is closely tied to fiscal policy and macroeconomic dynamics.

Fiscal policy decisions affect economic activity by influencing government spending, taxation, and borrowing. Expansionary fiscal policies, such as increased spending or tax cuts, can stimulate growth by boosting demand and investment. Contractionary policies, like spending cuts or tax hikes, can curb inflation and maintain stability. Domestic debt, acquired through

issuing bonds or securities, finances government spending and projects. Excessive domestic debt can lead to higher interest payments, crowding out private investment, and hindering growth. External debt, borrowed from foreign sources, can fund development projects and budget deficits. However, reliance on external borrowing exposes countries to currency and interest rate risks, potentially hindering growth. Sound fiscal management is crucial for maintaining stability and promoting growth. Balancing public investment with debt sustainability ensures manageable debt levels that support long-term growth (Smith, 2021; Jones, & Williams, 2020; IMF, 2019). Investment and productivity are crucial determinants of economic growth, and their relationship with domestic and external debt can significantly impact Nigeria's economy. Investment, both domestic and foreign, plays a pivotal role in driving economic growth by stimulating aggregate demand, enhancing productivity, and fostering innovation. Increased investment, particularly in infrastructure, manufacturing, and technology, can lead to higher economic growth rates and improved living standards .Productivity measures the efficiency of resource utilization in producing goods and services. Higher productivity levels lead to increased output and economic growth. Improving productivity through investments in human capital, technology, and infrastructure is essential for sustaining economic growth in Nigeria. Domestic debt, when used to finance productive investments, can stimulate economic growth by increasing capital accumulation and improving infrastructure. However, high levels of domestic debt can lead to higher interest rates, crowding out private investment, and reducing economic growth potential. Also, External debt can provide additional financing for development projects and infrastructure, supplementing domestic resources and boosting economic growth. However, reliance on external borrowing exposes Nigeria to exchange rate risks, debt servicing burdens, and vulnerability to external shocks, which can negatively impact economic growth. To maximize the benefits of debt-financed investment, Nigeria must carefully manage its debt levels to ensure sustainability and avoid potential risks to economic stability. Prudent debt management practices, transparency, and effective use of borrowed funds are essential for promoting economic growth while managing debt sustainability.

2.2. Theoretical Literature Review

In this section, various economic theories that link public debt to economic growth are reviewed. This will give the study a theoretical framework to analyze relationships among variables of interest. Some of these theories include:

Debt Overhang Theory

The Debt Overhang hypothesis of Krugman (1988) and Sachs (1989), suggests that high levels of debt, whether domestic or external, can hinder economic growth by discouraging investment and consumption. The theory focuses on situations where a country accumulates a significant amount of debt, both domestically and externally, relative to its income and assets. As the level of debt increases, creditors may become concerned about the country's ability to repay its debts in the future. This concern arises from the risk that the country may default on its debt obligations, leading to financial losses for creditors. The uncertainty surrounding the country's debt burden can have adverse effects on investment and consumption. Investors may be reluctant to commit funds to new projects or ventures due to concerns about the country's financial stability. Likewise, consumers may reduce their spending and increase their savings as a precautionary measure against future economic uncertainties. The decrease in investment and consumption resulting from the debt overhang can lead to slowed economic growth. Reduced investment in productive assets limits the economy's capacity to expand and create jobs, while lower consumption levels dampen aggregate demand and overall economic activity. The debt overhang creates a vicious cycle where high debt levels lead to slower economic growth, which in turn makes it more difficult for the country to generate the income needed to service its debts. This can further exacerbate concerns among creditors and perpetuate the cycle of economic stagnation. According to the findings of empirical studies, in general, a negative relationship is observed between investment and external debt (Sachs, 1989).

Debt-Led Growth Hypothesis

The Debt-Led Growth Hypothesis, proposed by economist Hyman Minsky in the 1980s, presents a contrasting view to traditional theories by arguing that debt can serve as a catalyst for economic growth if used effectively. Unlike conventional views that view debt as inherently detrimental, the Debt-Led Growth Hypothesis suggests that borrowing funds for productive investment, such as infrastructure development, education, or innovation, can stimulate economic activity. When used wisely, debt can finance projects that enhance productivity and generate long-term returns. Proponents of the theory argue that strategic borrowing can boost productivity by providing resources for investments in physical and human capital. For example, investments in infrastructure can improve transportation networks, reduce production costs, and facilitate economic transactions, thereby enhancing overall efficiency and productivity in the economy. The Debt-Led Growth Hypothesis contends that investments financed by debt can generate sufficient returns in the long run to repay the borrowed funds and generate additional income. For instance, investments in education and skills development can lead to a more skilled and productive workforce, resulting in higher incomes and tax revenues that can be used to service debt obligations. In essence, the hypothesis suggests that debt, when used prudently, can act as a catalyst for economic growth by providing the necessary resources to fuel investment, innovation, and productivity improvements. Rather than being a burden, debt becomes a means to stimulate economic activity and expand the productive capacity of the economy.

However, proponents of the Debt-Led Growth Hypothesis acknowledge that excessive reliance on debt can pose risks, particularly if the borrowed funds are not invested efficiently or if economic conditions deteriorate. Excessive debt accumulation without corresponding increases in productivity or income can lead to debt sustainability issues and financial instability.

Policymakers interested in harnessing the potential benefits of debt-led growth must carefully manage debt levels and ensure that borrowed funds are allocated to productive investments that yield positive returns. Effective debt management, coupled with policies to enhance productivity and innovation, can maximize the growth-enhancing effects of debt. In summary, the Debt-Led Growth Hypothesis challenges conventional wisdom by arguing that debt can spur economic growth if invested wisely in productive endeavors. By financing investments that enhance productivity and generate long-term returns, debt can act as a catalyst for economic development and prosperity.

External Debt Sustainability Theory

The External Debt Sustainability Theory, developed by economists at the International Monetary Fund (IMF) in the late 1990s, underscores the critical relationship between external debt levels and economic growth. This theory emphasizes the necessity for countries to maintain their external debt at sustainable levels to foster long-term economic prosperity. The theory highlights the importance of ensuring that a country's external debt remains at manageable levels relative to its income and export earnings. This involves assessing the country's ability to service its debt obligations without encountering financial distress or default. External debt is considered sustainable when a country can meet its debt payments, including principal and interest, without resorting to excessive borrowing or jeopardizing its economic stability. Sustainable debt levels vary depending on factors such as economic growth, export earnings, fiscal policy, and debt servicing capacity. The theory emphasizes the need for countries to align their external debt levels with their income and export earnings. Excessive reliance on external borrowing beyond a country's capacity to generate income and exports can lead to debt accumulation that outpaces economic growth, posing risks to financial stability. When external debt reaches unsustainable levels, countries may face debt crises characterized by an inability to service their debt obligations. Debt crises can have severe consequences for economic growth, including currency depreciation, inflation, reduced access to international capital markets, and the need for austerity measures or structural reforms. To promote external debt sustainability and economic growth, policymakers must adopt prudent debt management practices, including fiscal discipline, transparent borrowing policies, and effective debt monitoring mechanisms.

Additionally, countries may seek assistance from international financial institutions like the IMF to develop and implement debt management strategies.

Overall, the External Debt Sustainability Theory underscores the importance of maintaining prudent levels of external debt relative to income and export earnings to safeguard economic stability and foster sustainable growth. By prioritizing debt sustainability, countries can mitigate the risks of debt crises and create favorable conditions for long-term prosperity.

Endogenous Growth Theory and Debt

The endogenous growth theory, pioneered by economists such as Romer (1986) and Lucas (1988), provides a framework for understanding long-term economic growth as an outcome of factors within the economic system, particularly emphasizing the role of human capital, innovation, and knowledge spillovers. This theory is particularly relevant when examining the impact of debt on economic growth, as it allows for the consideration of how debt-financed investments in human capital and technology can potentially drive sustainable economic growth. Domestic debt, in the context of endogenous growth theory, can be viewed as a mechanism for mobilizing internal resources for investment in growth-enhancing sectors. Barro (1990) extended the endogenous growth model to include public spending, arguing that government expenditure can contribute to economic growth if it is directed towards productive investments. In this framework, domestic debt can be seen as a tool for financing such productive investments. However, the impact of domestic debt on economic growth is not straightforward. While it can provide necessary funds for investment, excessive domestic borrowing can lead to crowding out of private investment. Christensen (2005) argues that in many African countries, including Nigeria, domestic debt has often crowded out private sector credit, potentially hampering economic growth. This suggests a complex relationship between domestic debt and economic growth, where moderate levels of debt may stimulate growth, but excessive debt can be detrimental.

External debt introduces additional complexities to the growth equation. In the context of endogenous growth theory, external borrowing can be seen as a means of accessing foreign capital and technology, potentially accelerating the accumulation of knowledge and human capital. However, the impact of external debt on growth is heavily influenced by how the borrowed funds are utilized.

2.3 Empirical Literature Review

The empirical literature on the relationship between public debt (External and domestic) and economic growth in Nigeria has been a subject of considerable interest among researchers. Okeke et al. (2023) contribute to this body of literature by examining the empirical evidence of this relationship. Their study focuses on the impact of public debt on economic growth in Nigeria, utilizing annual data from 1981 to 2021 and the autoregressive distributed lag technique. The variables used in the study were real gross domestic product (RGDP), which is the proxy for economic growth, gross fixed capital formation (GFCF), external debt (EXDT), exchange rate (EXCR), domestic debt (DODT) and debt service repayment (DSRT) as the independent variables. The results of the findings show that the past value of RGDP, GFCF, EXDT and DSRT are positively significant in their impact on economic growth in Nigeria, indicating that these factors contribute substantially to the country's economic expansion. Specifically, the positively significant impact of the past value of RGDP suggests a strong growth momentum effect, while the positive significance of GFCF

highlights the crucial role of capital formation in driving growth. The positively significant impacts of EXDT and DSRT imply effective management of external borrowing and debt servicing, contributing to economic growth. Conversely, EXCR is found to be negatively significant in its impact on economic growth in Nigeria, suggesting that currency depreciation significantly hinders economic progress, possibly through increased import costs. DODT shows a negative but insignificant impact, indicating that while domestic borrowing may have some adverse effects, its influence on economic growth is not statistically significant. Based on the findings, the study recommends that government should formulate and effectively implement policy that would boost domestic revenue generation by broadening the revenue base, improving capacity to tax and curtailing ineffective government spending. Also, borrowed funds should be utilized for the diversification of the productive base of the economy, which could help mitigate the negative impacts of debt while capitalizing on its potential benefits for growth.

In a related study, Agu et al. (2023) examined the impact of Nigeria's public debt on economic growth using an auto-regressive distributed lag (ARDL) model and time series data of annual frequency spanning 1990 to 2021. The study expressed RGDP growth rate as a function of external debt, domestic debt, and debt service payment. Findings showed that external debt had a negatively significant effect on GDP growth rate in the short-run, but indicated a positively significant effect on GDP growth rate in the long-run. Domestic debt exerted a negatively significant influence on GDP growth rate both in the short and long run. Debt service payment had a negatively significant impact on GDP growth rate both in the short-run and the long-run. Results of Granger causality tests indicated a unidirectional causality flowing from external debt to GDP growth rate, as well as from debt service payment to GDP growth rate in Nigeria, suggesting that changes in these debt variables precede changes in economic growth. The study concluded that borrowing for expansionary fiscal policies is not detrimental if debts are properly utilized. The study therefore recommended that Nigeria's economic growth should be internally determined through enhanced economic activities by intensifying investment on local resources to boost productivity and to prevent debt trap. This study provides additional nuance to our understanding of debt's impact on economic growth in Nigeria, highlighting the complex and time-dependent nature of these relationships.

Olatunji and Akintoye (2024) in their study, investigated the relationship between debt composition and economic growth in Nigeria employing the structural vector autoregression (VAR) analysis and time series data from 1990 to 2023. Using real GDP growth rate as a proxy for economic growth, their study confirmed that different debt compositions, such as concessional and non-concessional debt, have significant impacts on economic growth dynamics in Nigeria. Specifically, the study found that concessional debt has a positively significant impact on real GDP growth rate, while non-concessional debt has a negatively significant impact. The study thus highlights the importance of prioritizing concessional financing and sustainable debt practices to support economic growth and development. Moreover, the findings emphasize the need for enhancing transparency and accountability in debt management practices to mitigate the risks associated with debt accumulation. Improving debt transparency, strengthening debt monitoring mechanisms, and enhancing governance frameworks can help ensure that debt-funded investments yield positive returns for economic growth and development in Nigeria. These findings provide valuable insights into the nuanced effects of different types of debt on Nigeria's economic growth, underscoring the importance of careful debt management strategies.

In a study, Ogboghro (2023) compared Nigeria and Ghana's domestic debt (DM) and economic growth (EG) from 2000 to 2021 using multiple regression analysis. The study examined treasury bills (TBL), treasury certificates (TCF), treasury bonds (TBD), development stock (DST), and promissory note (PNT), with one control variable, interest rate (INTR), in relation to economic growth (EG), proxied by real gross domestic product (RGDP) in Nigeria and Ghana. The findings indicate that TBL has an insignificant positive effect on RGDP in Nigeria, with no evidence of causality, but a substantial positive effect in Ghana, indicating unidirectional causality from TBL to RGDP in Ghana. Also, the results show that TCF has an insignificant effect on RGDP in both Nigeria and Ghana, with no evidence of causality. However, TBD has a substantial positive effect on RGDP in Nigeria, showing causality from TBD to RGDP, but no significant impact in Ghana. On the other hand, DST has a positively significant effect on RGDP in Nigeria, suggesting causality from DST to RGDP, while in Ghana, it shows no significant relationship. Conversely, PNT has a positively significant effect on RGDP in Ghana, with causality from PNT to RGDP, but it is insignificant in Nigeria. Finally, the study finds inconsistent effects of these domestic factors on EG in Ghana and Nigeria. The study suggests that the government should primarily borrow through FGN bonds, which have a substantial positive effect and bidirectional causality with RGDP, greatly benefiting economic growth (EG) in both Nigeria and Ghana.

Kalu, and Boniface (2023) adds further depth to the empirical literature on public debt and economic growth by highlighting the significance of savings-investment gaps and deficit financing in shaping a country's economic trajectory. By investigating the impact of public debt, proxied as internal and external debts, as well as interest rates, on economic growth, the research provides valuable insights into the mechanisms through which debt accumulation affects GDP dynamics. Employing an ex-post facto design with secondary data, the study utilizes a multiple regression model, employing ordinary least squares regression for analysis. The findings reveal that external debts exert a significant negative impact on GDP, while internal debts demonstrate a significant positive effect. Moreover, the study underscores the importance of prudently managing borrowed funds, emphasizing the need for judicious utilization of resources. It recommends prioritizing internal borrowing mechanisms before resorting to external debts and creating

conducive environments to ensure that public debt serves its intended purpose effectively. Overall, these findings contribute to the ongoing discourse on debt management strategies and their implications for sustainable economic development in Nigeria.

Oyadeyi, et al. (2024) in a study examined the threshold effect of debt on economic growth in Nigeria, with a view to investigating debt sustainability levels in the country. The analysis included yearly data from 1981 to 2021. To achieve its objectives, the study used two-regime threshold ARDL regression approaches. Findings reveal that the optimal thresholds for total debt as a ratio of GDP (TDB/GDP), GNI (TDB/GNI), total revenue (TDB/REV), and exports of goods and services (TDB/EXP) are 46.1%, 54.5%, 355.3%, and 24.9%, respectively. Findings also indicate that debt ratios below the threshold levels have a significant positive impact on economic growth. This is true for all the debt ratios, except debt-to-export ratio. However, debt ratios above the threshold levels have a negative and significant effect on Nigeria's economic growth. Furthermore, findings reveal that only the level of domestic debt is sustainable over the long and short run, whereas external debt and total debt are only sustainable over the long run. When expressed as ratios of GDP and GNI, evidence indicates that Nigeria's debt is not sustainable by all the five measures of debt adopted in the study, both in the short run and in the long run while total debt to revenue ratio is only sustainable only in the long run. To mitigate the negative effects of unsustainable public debt, the study advocated for fiscal reforms that effectively reduce deficit financing to keep the level of government debt low and be able to respond robustly to an economic shock, improve domestic revenue generation and infrastructure spending, and strengthen governance practices and institutions.

In a similar vein, Yusuf and Mohd (2023) examined the asymmetric effects of public debt on economic growth in Nigeria spanning from 1980 to 2020, employing the Nonlinear Autoregressive Distributed Lag method. Their empirical findings revealed that external debt had a significant positive impact on economic growth, displaying symmetry in both the short and long run. However, the payment of debt service, which supports the debt overhang hypothesis, exhibited a symmetric effect that hindered growth. Conversely, domestic debt was found to impede growth asymmetrically in the short term and linearly over the long term. Regarding foreign reserve holdings, a long-run influence was observed to be asymmetric, while a symmetric impact was noted in the short run, motivating growth. To address the adverse effects of unsustainable public debt, the study recommended fiscal reforms aimed at reducing deficit financing to maintain low levels of government debt, enabling robust responses to economic shocks. Additionally, enhancing domestic revenue generation and infrastructure spending, along with bolstering governance practices and institutions, were proposed as measures to mitigate the negative impacts of excessive public debt.

JO et al (2024) examined the impact of public debt on economic growth in Nigeria from 1981 to 2021using Auto Regression Distributed Lag (ARDL) model. Specifically, the study investigated the impact of total domestic debt, total external debt, investment and the effect of government expenditure on economic development in Nigeria. Gross Domestic Product (GDP) was used as a proxy for economic growth while Total domestic debt (TDD), Total external debt (TXD), Inflation rate (IFNR), Government expenditure (GEX), investment (INV) and gross domestic savings (GDS) were used as the explanatory variables. The result revealed that all variables (TDD), (TXD), (INFR), (GEX), (INV) and (GDS) had an insignificant impact on economic growth in the long- run while GEX has a significant impact on economic growth in the long- run. However, all variable were found to be insignificantly related to economic growth in the long- run. TDD, government expenditure and inflation rate were found to be positive and insignificantly related to economic growth in the long- run implying that their increase will improve economic growth in Nigeria in the long- run. On the other hand total external debt, investment and gross domestic savings exhibited a negative and insignificant effect on economic growth. This means that their increase will decrease economic growth in Nigeria in the long- run. The study concluded that public debt indices has an insignificant impact on economic growth in Nigeria in the long run. It is therefore recommended that policy makers should integrate appropriate measures towards ensuring suitable management of domestic debts; government should ensure that contracted national debts are directed towards encouraging investment in the country and through necessary monitoring committees should ensure that national debts are directed toward the provision of basic amenities and services required for the development of communities and societies of the nation.

In a comparative study carried out by Teoh, Muhammad, Wan, Rosita, Josephine, Abang, Mohd, Hisyam and Farah (2021) where they examined the nexus between external debt and economic growth in low and high governance groups of twenty-three countries comprising Pakistan, Philippines, Mexico, Indonesia, Nigeria, Thailand, Ukraine, Uganda, Malawi, Ghana, Zambia, and Colombia which make up the low governance countries. While the sample for high-governance countries includes Malaysia, Portugal, Spain, Greece, Germany, Canada, Luxembourg, Poland, the United Kingdom, the United States and Switzerland covering the period between 2011 and 2014. The result of their study revealed the significant effect of high scores in governance indicators such as voice and accountability (samples from low governance countries) and regulatory quality (samples from high governance countries). Prescribing the right policy is crucial to avoid the negative impact of the wrong policy prescription on economic growth. Employing dynamic panel data analysis based on the Generalized Method of Moments (GMM) the results are dissected into two groups, for low governance and high governance countries respectively and suggested that good debt management and feasible policy prescriptions are the keys to controlling external debt.

In another study, Chilombo and Jiang (2020) explored the relationship between external debt and economic growth in nine Southern African countries from 2000 to 2018 using a panel autoregressive distributed lag (ARDL) model as estimation technique. Their result revealed that short term external debt negatively affects economic growth over the long haul just as in the short run

while long term external debt shows a negative connection with economic growth for the short run and a negative significant connection among debt and economic growth over the long haul. This suggest that external funds gained are not being utilized for economic activities such as investment, capital formulation and technology and concluded that the requirement for policymakers in Southern Africa to not exclusively depend on external debt as a means to stimulate economic growth but should utilize aggressive techniques to improve and advance their economies.

3. DATA AND METHODOLOGY

The Debt-Led Growth Hypothesis provides a theoretical foundation for examining the relationship between public debt and economic growth. This hypothesis posits that borrowing, when utilized effectively, can stimulate economic growth by providing resources for productive investments (Reinhart & Rogoff, 2010). In the context of Nigeria, this theory suggests that both domestic and external debt could potentially drive economic growth if the borrowed funds are channelled into productive sectors of the economy. The hypothesis aligns with the study's objectives of analysing the effects of domestic and external debt on Nigeria's economic growth.

Model Specification

Following Okeke et al. (2023) with modification, the paper modelled economic growth proxy by GDPPC as a function of disaggregated public debt, public debt service payments and other control variables as specified:

$$GDPC = F(TDDT, TEXD, PDES, GFCF, TLFP, INFL) \quad 1$$

The econometric form of the model is specified as:

$$GDPC_t = \beta_0 + \beta_1 TDDT_t + \beta_2 TEXD_t + \beta_3 PDES_t + \beta_4 GFCF_t + \beta_5 TLFP_t + \beta_6 INFL_t + \mu_t \quad 2$$

Where: $GDPC_t$ = gross domestic product per capita at time t, $TDDT_t$ = total domestic debt outstanding at time t, $TEXD_t$ = total external debt outstanding at time t, $PDES_t$ = public debt service payments at time t, GFCF = gross fixed capital formation at time t, $TLFPR_t$ = total labour force participation rate at time t, $INFL_t$ = inflation rate at time t, β_0 = intercept term, β_1, β_2, β_3, β_4, β_5, β_6 = coefficients of the respective independent variables μ_t = error term at time t, t = time period. Based on a priori, all the variables are expected to impact positively on GDPC except inflation rate that should impact negatively on GDPC.

Model Justification

Model justification refers to the reason behind the choice of variables selected to constitute the model specification. This model was chosen in order to achieve objectives 1, 2 and 3 which are to investigate the impact of domestic debt, external debt and public debt service payments on Nigeria's economic growth. The model was drawn from the reviewed related literature in this study especially the Debt-Led Growth Hypothesis and the empirical model of Okeke et al. (2023). The dependent variable is gross domestic product per capita used to proxy economic growth in Nigeria. while domestic debt, external debt, debt service payments are the core independent variables, gross fixed capital formation, total labour force participation rate and inflation rate entered the model as control variables. The data covered the period of 1990 to 2023. The description of variables, measurements and data sources are presented on Table 1.

Table 1: Description of variables, measurements and data sources

Variables	Measurements	Data sources
Gross domestic product per capita (GDPC)	GDP per capita (current LCU)	World Development Indicators, WDI (2024)
Domestic Debt (TDDT)	Total domestic debt outstanding (N'Billion)	Debt Management Office (2024)
External Debt (TEXT)	Total external debt outstanding (N'Billion)	Debt Management Office (2024)
Public debt service payments (PDES)	Public debt service payments (N'Billion)	Debt Management Office (2024)
Gross fixed capital formation (GFCF)	Gross fixed capital formation (N'Billion)	Central Bank of Nigeria Statistical Bulletin, CBN (2024)
Labour force participation rate (TLFP)	Labour force participation rate, total (% of total population ages 15-64) (Modelled ILO estimate	World Development Indicators, WDI (2024)
Inflation rate (INFL)	Inflation, consumer prices (annual %)	World Development Indicators, WDI (2024)

Sources: Researchers' compilation (2025)

Estimation Technique

The parameters of the model for this study were estimated using autoregressive distributed Lag (ARDL) model. The Augmented Dickey-Fuller test was employed to test for unit root since the data is time series in nature and in order to avoid spurious regression. To determine the long run relationship among the variables of the model, the ARDL Bounds test for co-integration was employed. After these, post-estimation tests were carried out to test the reliability and validity of the estimates. These tests are necessary to ensure that our estimates are good for economic prediction and policy formulation.

Autoregressive Distributed Lag (ARDL) model is a model which includes one or more lagged values of the dependent variable among the explanatory variables. The major restriction imposed for adoption of this method is that none of our series should go beyond I(1). ARDL produces both the long run and short run of the model as follows.

$$\Delta \ln GDPC_t = \beta_0 + \beta_1 \ln GDPC_{t-1} + \beta_2 \ln TDDT_{t-1} + \beta_3 \ln TEXD_{t-1} + \beta_4 \ln PDES_{t-1} + \beta_5 \ln GFCF_{t-1} + \beta_6 TLFP_{t-1}$$

$$+\beta_7 INFL_{t-1} + \ln \beta_{8t-1} + \sum_{j=1}^{k} \psi_{1j} \Delta GDPC_{t-j} + \sum_{j=0}^{k} \psi_{2j} \Delta TDDT_{t-j} + \sum_{j=0}^{k} \psi_{3j} \Delta TEXD_{t-j} + \sum_{j=0}^{k} \psi_{4j} \Delta PDES_{t-j} + \sum_{j=0}^{k} \psi_{5j} \Delta GFCF_{t-j}$$

Where ψ_1 to

$$+\sum_{j=0}^{k} \psi_{6j} \Delta TLFP_{t-j} + \sum_{j=0}^{k} \psi_{7j} \Delta INFL_{t-j} + \mu_t \quad 3$$

ψ_7 are the coefficients of the short-run parameters, β_1 to β_7 are the coefficients of the long-run parameters, Δ = first difference operator, ln denotes variables in their natural log form, K is the lag order selected by Akaike information criterion (AIC), while μ_t is the white noise assumed to be normally distributed, t is a subscript denoting time, the variables are as itemized above.

4. DATA ANALYSIS AND DISCUSSION

This section presents the data analysis and discussion of results. The descriptive statistics in Table 2 reveals the characteristics of data used in the empirical analysis.

Table 2: Summary of descriptive statistics

Variables	GDPC	TDDT	TEXD	PDES	GFCF	TLFP	INFL
Mean	285282.3	5131.421	2.350951	866.8179	28.22232	59.44127	18.08467
Median	284949.4	1753.259	1.659825	363.5100	26.74420	60.24900	12.87658
Maximum	379251.6	22210.36	6.521339	5656.580	53.12219	60.71200	72.83550
Minimum	202255.7	84.09310	0.100218	19.40000	14.16873	55.27000	5.388008
Std. Dev.	65595.59	6174.676	2.069155	1325.117	11.20287	1.530935	16.10793
Skewness	0.004011	1.275963	0.760252	2.191273	0.423881	-1.333597	2.198991
Kurtosis	1.341286	3.561893	2.223310	7.340093	2.132215	3.606935	6.826438
Jarque-Bera	3.783168	9.388574	4.008373	52.30928	2.023656	10.28815	46.72782
Probability	0.150833	0.009147	0.134770	0.000000	0.363554	0.005834	0.000000
Sum	9414315.	169336.9	77.58137	28604.99	931.3367	1961.562	596.7940
Sum Sq. Dev.	1.38E+11	1.22E+09	137.0049	56189897	4016.140	75.00034	8302.893
Observations	33	33	33	33	33	33	33

Source: Researchers' computation (2025) using Eviews

The high spread of the mean and median as well as large values of the standard deviation of GDPC, TDDT and PDES implies that their data are unevenly spread around their sample means whereas the closeness of the mean and median as well as small values of the standard deviation of TEXD, GFCF, TLFP and INFL implies that their data cluster around their samples. The skewness which is a measure of asymmetry of the distribution indicates that all the variables are positively skewed except total labour force participation rate that is negatively skewed. On the other hand, the kurtosis which is a measure of the peakedness or the flatness of the distribution indicates that TDDT and TLFP with kurtosis values are around 3 are medium-tailed (mesokurtic); GDPC, TEXD, and GFCF with kurtosis values less than 3 are thin-tailed (platykurtic); whereas PDES and INFL with kurtosis values greater than 3 are fat-tailed (leptokurtic). The probability values of the Jarque-Bera statistics indicate that GDPC, TEXD and GFCF normally distributed since their respective p-value of 0.150833, 0.134770 and 0.363554 are less than 0.05.

The correlation matrix in Table 3 shows the level of association between the variables of the model.

Table 3: Correlation Matrix

Correlation	GDPC	TDDT	TEXD	PDES	GFCF	TLFP	INFL
GDPC	1.000000						
TDDT	0.758383	1.000000					
TEXD	-0.731838	-0.471472	1.000000				

PDES	0.585267	0.757255	-0.316857	1.000000			
GFCF	-0.729855	-0.442081	0.759913	-0.250584	1.000000		
TLFP	-0.760889	-0.627387	0.528513	-0.453554	0.623425	1.000000	
INFL	-0.406072	-0.216239	0.558251	-0.139903	0.417160	0.276418	1.000000

Source: Researchers' computation (2025) using Eviews

Table 3 reveals that TDDT and PDES are positively correlated with GDPC while TEXD, GFCF, TLFP and INFL are negatively correlated with GDPC. The correlation coefficients reveal that none of the explanatory variables are correlated at above 0.76. Consequently, there is no multicollinearity among the independent variables as indicated by the correlation matrix.

The unit root test of stationarity was carried out so as to avoid spurious regression. The study used the Augmented Dickey-Fuller (ADF) unit root test result is presented in Table 4.

Table 4: ADF Unit Root Stationarity Test

At Level			At First Difference		
Variables	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	Conclusion
GDPC	-0.922105	-2.960411	-2.968481	-2.960411	I(1)
TDDT	3.257039	-2.991878	1.562661	-2.998064	I(0)
TEXD	-2.357890	-2.957110	-4.827062	-2.967767	I(1)
PDES	14.34119	-2.957110	3.086661	-2.963972	I(0)
GFCF	-2.578693	-2.957110	-4.336542	-2.960411	I(1)
TLFP	-2.216695	-2.960411	-4.195572	-2.963972	I(1)
INFL	-2.156271	-2.957110	-4.301436	-2.963972	I(1)

Source: Researchers' computation (2025) using Eviews

Table 4 indicates that total domestic debt (TDDT) and public debt service payments (PDES) are stationary at levels because their ADF test statistics are greater than the critical values at 5 percent significant level while gross domestic product per capita (GDPC), total external debt (TEXD), gross fixed capital formation (GFCF), total labour force participation rate (TLFP) and inflation rate (INFL) are stationary at first difference. This means that the variables have a mixture of I(0) and I(1) stationarity properties. Based on the mixture of I(0) and I(1) stationary properties of the variables, the ARDL estimation technique is therefore suitable for the data analysis of this study. The study now tests for cointegration among the variables and the result is presented in Table 5.

Table 5: ARDL Bounds Test to Cointegration Result

Test statistic	Value	K
F-statistic	4.846812	6
Critical Value Bounds		
Significant	I0 Bound	I1 Bound
10%	1.99	2.94
5%	2.27	3.28
2.5%	2.55	3.61
1%	2.88	3.99

Source: Researchers' computation (2025) using Eviews

Table 5 indicates that there is cointegration between the GDPC and explanatory variables because the F-statistic value of 4.846812 is greater than the upper bound critical value at 5% which is 3.28. The detection of this long run relationship necessitates the estimation of both the short-run and the long-run results. The model chosen lag selection criterion is the Akaike information criterion (AIC) with ARDL(1, 0, 0, 1, 0, 0, 0) and the selection criterion ranges from 4.02 to 4.18 in absolute terms for the top 20 models.

ARDL Short-run and Long-run Results

The short run result is shown in Table 6 while the long run result is presented in Table 5.

Table 6: ARDL Short Run Result (Dependent Variable: LNGDPC)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDPC(-1)*	-0.197411	0.063638	-3.102103	0.0050
LNTDDT**	-0.036560	0.018274	-2.000676	0.0574
LNTEXD**	-0.014504	0.009210	-1.574839	0.1290
LNPDES(-1)	0.044650	0.016956	2.633262	0.0149
LNGFCF**	-0.071857	0.030241	-2.376186	0.0262
TLFP**	0.004817	0.004944	0.974339	0.3400
INFL**	-0.000542	0.000365	-1.485092	0.1511
D(LNPDES)	0.018387	0.013462	1.365844	0.1852
CointEq(-1)*	-0.197411	0.027759	-7.111641	0.0000
R-squared		0.577534	Mean dependent var	12.54091
Adjusted R-squared		0.563451	S.D. dependent var	0.236842
S.E. of regression		0.026730	Akaike info criterion	-4.173767
Sum squared resid		0.016434	Schwarz criterion	-3.761529
Log likelihood		75.78027	Hannan-Quinn criter.	-4.037122
F-statistic		301.3372	Durbin-Watson stat	2.004673
Prob(F-statistic)		0.000000		

Source: Researchers' computation (2025) using Eviews

Table 6 shows the ARDL short run result using the Akaike information criterion (AIC) and maximum dependent lag length of one. The dependent variable is gross domestic product per capita in its natural logarithm (LNGDPC) while the independent variables total domestic debt outstanding in its natural logarithm (LNTDDT), total external debt outstanding in its natural logarithm (LNTEXD), public debt service payments in its natural logarithm (LNPDES), gross fixed capital formation in its natural logarithm (LNGFCF), total labour force participation rate (TLFP) and inflation rate (INFL). The short-run result in Table 6 indicates that the previous values of gross domestic product per capita at lag 1 (LNGDPC(-1) significantly reduced LNGDPC by 0.1974 unit in the following period. Total domestic debt made negative and significant impact on gross domestic product per capita in the short-run. Specifically, a unit increase in LNTDDT reduced LNGDPC by 0.0365 unit in the short-run. Total external debt made negative and insignificant impact on gross domestic product per capita as a unit increase in LNTEXD reduced LNGDPC by 0.0145 unit in the short-run. Public debt service payments made positive and insignificant impact on gross domestic product per capita as a unit increase in LNPDES increased LNGDPC by 0.0183 unit in the short-run. However, public debt service payments at lag 1 (LNPDES(-1) made positive and significant impact on gross domestic product per capita as it generated about 0.0446 unit increase in LNGDPC in the short-run. Gross fixed capital formation made negative and significant impact on gross domestic product per capita as a unit increase in LNGFCF reduced LNGDPC by 0.0718 unit in the short-run. Total labour force participation rate made positive and insignificant impact on gross domestic product per capita as a unit increase in TLFP increased LNGDPC by 0.0048 unit in the short-run. Inflation rate made negative and insignificant impact on gross domestic product per capita as a unit increase in INF reduced LNGDPC by 0.0005 unit in the short-run.

The result further indicates that the error correction mechanism which shows the speed of adjust is correctly signed as it is negative and significant. The error correction coefficient of 0.197411 reveals that about 19.74% of the errors is corrected annually to ensure convergence at the long run. The coefficient of determination (R-squared) value of 0.577534 implies that about 57.75% of the variation in LNGDPC is jointly explained by the independent variables of the model while the remaining 42.26% may be due to the error term, that is, other explanatory variables of LNGDPC not included in the model. The overall model is significant as indicated by the F-statistic value of 301.3372 and its corresponding probability value of 0.000000 which is less than 0.05. The Durbin-Watson statistic of 2.004673 which is approximately 2 indicates absence of autocorrelation in the model. The long run result of the study is presented in Table 7.

Table 7: ARDL Long Run Result (Dependent Variable: LNGDPC)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNTDDT	-0.185198	0.106691	-1.735833	0.0960
LNTEXD	-0.073470	0.045923	-1.599835	0.1233
LNPDES	0.226178	0.087609	2.581689	0.0167
LNGFCF	-0.363997	0.165423	-2.200396	0.0381
TLFP	0.024402	0.028374	0.860023	0.3987
INFL	-0.002745	0.002248	-1.220634	0.2346
C	12.54443	1.553216	8.076420	0.0000

Source: Researchers' computation (2025) using Eviews

The ARDL long run result in Table 7 reveals that total domestic debt made negative and insignificant impact on gross domestic product per capita as a unit increase in (LNTDDT) reduced LNGDPC by 0.1851 in the long-run. Total external debt made negative and insignificant impact on gross domestic product per capita as a unit increase in (LNTEXD) reduced LNGDPC by 0.0734 in the long-run. Total debt service payments made positive and significant impact on gross domestic product per capita as a unit increase in (LNPDES) generated about 0.2261 unit increase in LNGDPC in the long-run. Gross fixed capital formation made negative and significant impact on gross domestic product per capita as a unit increase in LNGFCF reduced LNGDPC by 0.3639 unit in the long-run. Total labour force participation rate made positive and insignificant impact on gross domestic product per capita as a unit increase in TLFP increased LNGDPC by 0.0244 unit in the long-run. Inflation rate made negative and insignificant impact on gross domestic product per capita as a unit increase in INF reduced LNGDPC by 0.0027 unit in the long-run.

DISCUSSION OF RESULTS

The result indicates that public debt service payments and total labour force participation rate conform to a priori expectation as their coefficients are correctly signed based on what the relevant economic theories state in both the short-run and long-run. However, total domestic debt, total external debt and gross fixed capital formation does not conform to theoretical postulation in both the short-run and long-run. The unconformity of total domestic debt and total external debt may be attributed to the fact that the successive governments of Nigeria over the years did not utilize the borrowed funds productively by investing them in productive venture rather most of the borrowed funds were utilized unproductively. Another reason may be that Nigeria's public debt has outgrown the threshold at which public debt impacts positively on the economy. Sachs (2002) explained the nonlinear relationship between debt and economic growth using the debt Laffer curve. According to this theory, there is a point at which public debt activates economic growth and any additional debt beyond this point becomes inimical to economic growth. The unconformity of gross fixed capital formation may be due to low rate of capital accumulation in Nigeria far below the rate of population growth rate or labour force thus leading to diminishing marginal product of capital.

From the analysis, total domestic debt (TDDT) had a negative and significant impact on Gross domestic product per capita in both the long-run and the short-run and this was in line with Agu et al (2023) and Elom-obed et al (2017). This suggests that increasing domestic debt is associated with a decline in economic growth. Total external debt in both the short-run and long-run had a negative and insignificant impact on gross domestic product per capita and this was in line with the postulations of Isibor et al (2018), Ajayi and Edewusi (2020), Kalu and Boniface, Elom-obed et al (2017) which suggests that external debt, while contributing to financing, does not immediately translate into economic growth possibly due to inefficiencies in the utilization of borrowed funds or structural issues within the economy that inhibit effective use of such debt. Public debt service payments (PDES) which refers to payments made by the government to service its public debts (PDES) had a positive and insignificant impact on gross domestic product per capita in the short-run and in the long-run it had a positive and significant impact on gross domestic product per capita. Gross fixed capital formation (GFCF) which is the total value of fixed assets produced or acquired by a country's resident minus disposals, during a given period (usually a year) had a negative and significant impact on gross domestic product per capita in both the short-run and the long-run. This indicates that capital accumulation may not be occurring at a rate sufficient to stimulate growth, possibly due to misallocation of resources or lack of investment in productive sectors. Total labour force participation rate (TLFP) which is the percentage of the working population (usually 15-64 years) had a positive and significant impact on gross domestic product per capita in both the short-run and the long-run. This means TLFP promotes economic growth in Nigeria. Inflation (INFL) which is the persistent increase in the price of goods and services over a period of time had a negative and insignificant impact on gross domestic product per capita in both the short run and long run meaning that it retards economic growth in Nigeria.

Diagnostic tests

To ensure the reliability of the model estimates for forecasting and policy formulation, the study carried out econometrics and stability tests. The results of the test are presented in Table 8.

Table 8: Diagnostic Tests

Normality Test: Jarque-Bera statistic = 3.247985 Prob. = 0.197110			
Breusch-Godfrey Serial Correlation LM Test			
F-statistic	0.755311	Prob. F(2,21)	0.4822
Obs*R-squared	2.147426	Prob. Chi-Square(2)	0.3417
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.305924	Prob. F(8,23)	0.9561
Obs*R-squared	3.077582	Prob. Chi-Square(8)	0.9294
Scaled explained SS	1.635015	Prob. Chi-Square(8)	0.9902
Multicollinearity Test			
Variable	Coefficient Variance	Uncentered VIF	Centered VIF

LNGDPC(-1)	0.004050	28475.06	9.800348
LNTDDT	7.64E-05	175.0218	6.106548
LNTEXD	8.48E-05	5.448902	5.161701
LNPDES	0.001089	582.2913	7.882145
LNPDES(-1)	7.81E-05	4.170668	3.950840
LNGFCF	0.000914	435.8129	6.180853
TLFP	2.44E-05	3865.483	2.508928
INFL	1.33E-07	3.547101	1.524609
C	0.862882	38644.55	NA

Source: Researchers' computation (2025) using Eviews

The result Table 8 shows that the data is normally distributed, and there is absence of serial correlation, heteroskedasticity, and multicollinearity among the series. The can be seen from the insignificant p-values (above 0.05) of J-B, B-G and B-P-G tests for serial correlation and heteroskedasticity, and the centered VIF values that are less than 10 for multicollinearity test.

Stability Test

To check the stability of the long-run coefficient and the short-run movements for the ARDL Error correction model, the Cumulative Sum (CUSUM) and the Cumulative Sum of squares are adopted. The model is said to be stable if the plots of the Cumulative Sum and the Cumulative Sum of squares statistics lie within the critical bounds of 5 percent significant level. The plots are shown in Figure 1. From Figure 1, it can be seen that the plot of the cumulative sum and the cumulative sum of squares statistics lie within the critical bounds of 5 percent significant level. Therefore, we conclude that the model is stable and the parameter estimates from the model are reliable for prediction and policy formulation.

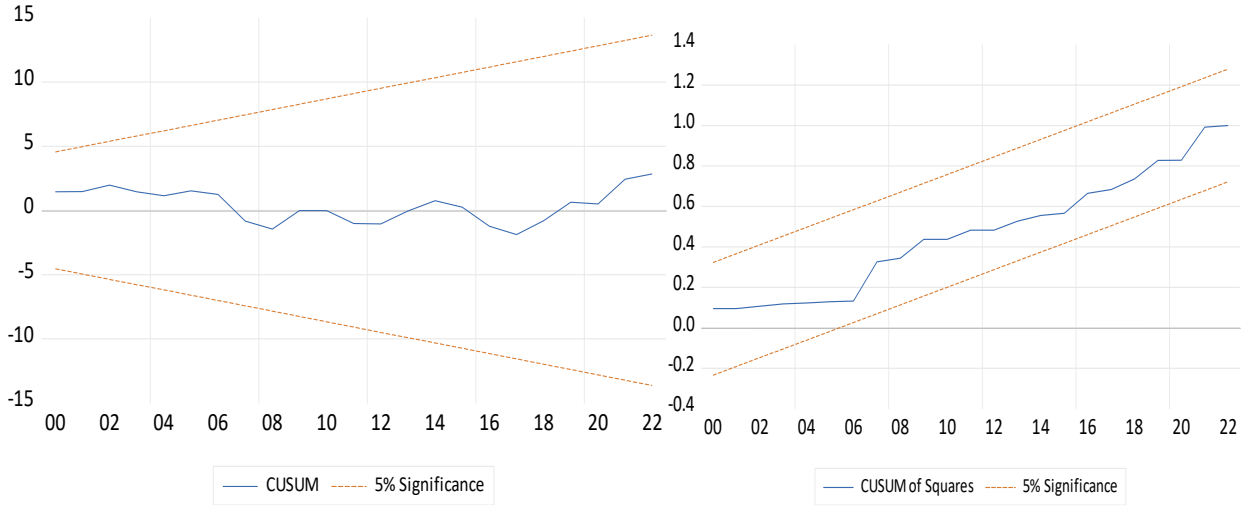

Figure 1: Cumulative sum test and cumulative sum of squares test
Source: Researchers' computation (2025) using Eviews

5. CONCLUSION, POLICY IMPLICATIONS AND RECOMMENDATIONS

The study examined the impact of public debt on economic growth in Nigeria from 1990-2023 using time series data and autoregressive distributed lag model. Review of related literature was robust. The ADF unit root test result implicated some variables as being integrated of order zero and others at order one. The ARDL cointegration indicated existence of long-run relationship among the variables which necessitated estimation of both short-run and long-run results.

Based on the findings, this study concludes that while both domestic and external debts can play crucial roles in financing Nigeria's economic growth, excessive or poorly managed debt can have adverse effects. The findings underscore the necessity for robust fiscal policies and strategic debt management to ensure that borrowing contributes positively to economic growth.

The following are the findings:

i. Domestic debt and external debt made negative and insignificant impact of GDPC in both short-run and long-run.
ii. Public debt service payment made positive impact on GDPC in both short-run and long-run with the latter being significant.
iii. Control variables of gross fixed capital formation and inflation impacted negatively on GDPC with the former being significant in both short-run and long-run Whereas total labour force participation rate made consistent positive and insignificant impact on GDPC in both short-run and long-run.

Based on the findings of the study, the following policy recommendations are proposed:

i. Strengthening debt management: the government should enhance its debt management framework to ensure that both domestic and external borrowing support productive investments rather than excessively financing recurrent expenditures.

ii. Investment in growth-enhancing sectors: government should direct borrowed funds towards infrastructure, education, and healthcare, since these sectors can give long term economic growth.

iii. Enhancing revenue generation: government should improve tax collection and diversify the economy to reduce reliance on debt financing, thereby creating a more sustainable fiscal environment.

iv. Monitoring debt levels: The Nigerian government should establish a debt sustainability framework to monitor and evaluate the long-term implications of borrowing on economic growth.

The major limitations encountered by this study are the data inconsistency and finance but for the fact that the data collected were secondary data, the cost constraints did not have much impact and the data were collected from only verifiable and authentic sources like the Central Bank of Nigeria (CBN) statistical bulletin and World Development Indicators which made the findings of this study plausible. The study focused on the impact of public debt on economic growth in Nigeria using the ARDL technique. However, there is still much to be done. Future researchers who have interest in this area of study should conduct a cross country analysis of the impact of public debt on economic growth using other suitable methodologies and also compare Nigeria's debt situation with other developing countries to identify best practices in debt management. They can also embark on a sectoral growth impact of public debt in Nigeria.

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