

Impact of Public Debt on Infrastructural Development in Nigeria (1990 – 2025)

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Abstract: *This paper examines the impact of public debt on infrastructural development in Nigeria from 1990 to 2025. Infrastructure is crucial for economic growth and improving living standards, however, Nigeria faces a large infrastructure deficit after decades of underinvestment. To address this, the government has borrowed substantially, both domestically and externally, to finance infrastructure projects. This study investigates how the accumulation of public debt and debt servicing has affected capital expenditure and infrastructure outcomes. An autoregressive distributed lag (ARDL) model is employed to estimate the influence of external debt, domestic debt, and debt servicing on capital expenditure over the period. The results indicate that external debt has a positive but insignificant relationship with capital expenditure, while domestic debt is positively and significantly related to capital expenditure on infrastructure. However, debt servicing exhibits a negative association. This implies increasing domestic borrowing could enhance infrastructure development more than external financing. However, the debt burden constrains infrastructure investment. The study concludes that rising debt has not translated into commensurate gains in infrastructure quantity and quality, underscoring deeper institutional and governance challenges. Effective reforms are needed to ensure debt is invested productively to improve infrastructure. Prudent debt management and greater accountability in executing projects can help strike a balance between infrastructure financing needs and fiscal sustainability.*

Keywords: capital expenditure, debt servicing, infrastructure development, public debt,

INTRODUCTION

Nigeria, positioned in the heart of West Africa, boasts of abundance of valuable resources, including extensive reserves of oil, natural gas, and mineral wealth (Ite et al., 2024). These resources have historically positioned Nigeria as a significant player in both the African and global economies. However, despite this substantial economic potential, Nigeria has faced persistent and formidable challenges in the creation and maintenance of its infrastructure (Okafor, 2024; Ndubuisi, 2025). This ongoing struggle has run parallel to the country's noteworthy accumulation of public debt over the past decades (World Bank, 2021). Infrastructure, encompassing transportation networks, energy production, water supply systems, and telecommunications infrastructure,

constitutes the very foundation upon which a nation's development is constructed (Calderón & Servén, 2023; World Bank, 2024). It serves as the essential framework upon which economic activities, the provision of social services, and the enhancement of public welfare rest. Throughout the historical period from 1990 to 2025, Nigeria's infrastructure landscape has stood at a critical juncture, a bottleneck that has consistently curtailed the nation's pursuit of sustained economic growth and global competitiveness (World Economic Forum, 2020; Ebohon, 2012). To address these infrastructure deficits and catalyze development, Nigeria's government has frequently resorted to borrowing as a pivotal strategy for financing ambitious infrastructure projects (Adeyemi & Adu, 2017b; Ajaero & Eboh, 2019; Akande, 2017). This strategic approach to financing, while essential for infrastructure development, has resulted in the significant accumulation of public debt, both domestically and on the international stage (Central Bank of Nigeria, 2020). Consequently, managing this debt effectively while ensuring that it genuinely contributes to the sustainable growth and development of infrastructure in the country has become a multifaceted and intricate task that necessitates meticulous analysis and thoughtful policy formulation (IMF, 2021).

Nigeria's total public debt stock stood at ₦159.28 trillion (\$110.97 billion) as at 31 December 2025 (Nigerian DMO, 2026). This represents a threefold increase in the last decade, driven by increased government borrowing to finance fiscal deficits (Muibi & Sinbo, 2021). Domestic debt accounts for 53% of total debt, amounting to ₦84.85 trillion (\$59.12 billion). This consists primarily of FGN Bonds (₦63.63 trillion), Treasury Bills (₦13.85 trillion), Sukuk Bonds (₦1.19 trillion), FGN Savings Bonds (₦104.32 billion), FGN Green Bonds (₦62.35 billion), Promissory Notes (₦1.54 trillion) and others (DMO 2026). External debt stands at \$51.86 billion, comprising 47% of total debt (Nigeria DMO, 2026). Multilateral creditors such as the World Bank and African Development Bank hold around 45.99% of external debt. Other creditors include China, commercial banks, and Eurobonds. Nigeria's growing debt burden and high debt service costs pose fiscal risks. However, government revenues remain low at just 8% of GDP in 2021 (IMF, 2021). This constrains fiscal space for much-needed development spending. This paper seeks to assess the impact of public debt on infrastructural development in Nigeria between 1990 and 2025, specifically establishing the impact of external debt, domestic debt, and debt servicing on capital expenditure.

Governments in the past have come up with fiscal reforms and debt management strategies aimed at optimizing the allocation of debt for infrastructure (CIA World Factbook, 2020). However, challenges remain in ensuring effective implementation and balancing debt allocation with competing fiscal demands (World Bank, 2021). The problem then lies in determining how the allocation of public debt, including external and domestic debt influences the government's decisions regarding capital expenditure in Nigeria from 1990 to 2025, and what challenges persist in optimizing debt allocation for infrastructure development despite recognition (World Bank, 2021). Debt restructuring, refinancing, and negotiations have been employed by the Nigerian government to alleviate debt service burdens. Nevertheless, the persistent challenge lies in achieving a sustainable balance between debt service obligations and infrastructure investment (Adegbe & Fakile, 2020). The study aims to address the extent to which the burden of debt service affects the availability of financial resources for critical infrastructure projects in Nigeria during the specified timeframe, and how can the adverse effects of heavy debt servicing on infrastructure development be mitigated (Adegbe & Fakile, 2020). The study objectives are designed to systematically investigate how public debt, encompassing external

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and domestic debt, and debt service influences capital expenditure and infrastructure development in Nigeria from 1990 to 2025, employing statistical analysis to unravel the intricate relationships. The study seeks to:

- i. analyze the influence of external debt (EXDt) on capital expenditure (CAPEXt) in Nigeria from 1990 to 2025.
- ii. investigate the impact of domestic debt (DDt) on capital expenditure (CAPEXt) in Nigeria from 1990 to 2025.
- iii. assess the effect of debt service (DSt) on capital expenditure (CAPEXt) in Nigeria from 1990 to 2025.

The following hypotheses in their null form serve as the baseline assumptions to be tested in the study, helping to assess whether the specified relationships between public debt components and capital expenditure are statistically significant.

- H0₁:** There is no significant relationship between external debt (EXDt) and capital expenditure (CAPEXt) in Nigeria from 1990 to 2025.
- H0₂:** There is no significant relationship between domestic debt (DDt) and capital expenditure (CAPEXt) in Nigeria from 1990 to 2025.
- H0₃:** Debt service (DS) has no significant impact on capital expenditure (CAPEXt) in Nigeria from 1990 to 2025.

The significance of this study is multifaceted and underscores its importance within the context of Nigeria's economic development and broader global implications. This study is of paramount significance as it addresses a critical issue that has far-reaching implications for Nigeria's socio-economic development. The relationship between public debt and infrastructure development is pivotal, given that infrastructure forms the bedrock of economic growth and enhanced living standards. Understanding how public debt influences infrastructure investment can guide policymakers in optimizing the allocation of resources for sustainable development. The findings of the study are crucial for informed decision-making by government officials, financial institutions, and development partners. By quantifying the impact of external and domestic debt, and debt service obligations on capital expenditure and infrastructure quality, this research can provide actionable insights. These insights can inform debt management strategies, helping Nigeria strike a balance between leveraging debt for development and maintaining fiscal prudence. Also, in a global context, this study contributes to the broader discourse on debt sustainability and infrastructure development. Nigeria's experiences are relevant to other developing nations facing similar challenges. By examining Nigeria's debt-infrastructure nexus, this research offers lessons and best practices that can benefit other countries grappling with similar issues, thereby contributing to global economic stability.

Basically, the study contributes to academic scholarship by adding empirical evidence to the field of economics and development studies. It enhances our understanding of the intricate relationship between public debt and infrastructure development, thereby enriching the knowledge base for future research and policy formulation in both Nigeria and the broader international community. The study's significance lies in its potential to guide Nigeria towards more effective and sustainable debt management, promote infrastructure development, and offer valuable lessons to other nations facing similar challenges. Furthermore, it contributes to

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academic scholarship and supports international efforts to foster global economic stability and development.

The scope of this study encompasses various key sections, each contributing distinct perspectives. The introduction introduces the research problem, outlines objectives, and highlights the significance and research questions guiding the study. The literature review critically analyzes existing scholarly work on debt, infrastructure, and related theories, including global and regional perspectives. The Materials and Method section outlines the approach employed for investigating research questions and testing the specified model. It discusses data sources, collection methods, and statistical techniques, emphasizing the importance of the 1990-2025 timeframe for data analysis.

LITERATURE REVIEW

Conceptual Review

Capital Expenditure in Nigeria

Capital expenditure in Nigeria, spanning the period from 1990 to 2025, holds significant importance in the nation's economic and developmental landscape. It denotes the substantial financial investments made by the Nigerian government and various institutions in critical infrastructure projects and long-term assets. These investments have been directed towards sectors of paramount significance, including transportation, energy, water supply, telecommunications, and public facilities, with the overarching goal of stimulating economic growth, enhancing the quality of life for citizens, and fostering sustainable development (Economic Intelligence Unit, 2020; Economic Commission for Africa. 1999).

Capital expenditure has not been limited to utilities but has also extended to essential services like water supply. Nigeria has invested in expanding access to clean and potable water sources, a crucial step for public health and sanitation. Ensuring that a larger portion of the population has access to safe drinking water has been essential in reducing waterborne diseases and enhancing overall well-being (Ezeaku & Ohazurike, 2016). However, challenges, including inefficient resource allocation and infrastructure maintenance, have affected the optimal delivery of these services (Okafor, 2018b). Capital expenditure in Nigeria from 1990 to 2025 has played a vital role in promoting economic growth, enhancing living standards, and fostering sustainable development. However, challenges related to project execution, resource allocation, and the interplay between public debt and infrastructure development have underscored the need for careful analysis and policy consideration in Nigeria's ongoing efforts to address its infrastructure deficits and achieve its developmental goals.

Nigeria Public Debt

Public debt in Nigeria between 1990 and 2025 signifies the cumulative financial obligations that the Nigerian government, at various administrative levels (federal, state, and local), undertook to address budgetary shortfalls and finance critical development projects. These obligations primarily encompass both external debts, owed to foreign creditors, and domestic debt, owed to creditors within Nigeria's borders. Public debt serves as a financial instrument allowing the government to bridge the gap between its revenues and expenditures, facilitating investments in vital sectors such as infrastructure, education, healthcare, and social services.

External debt forms a substantial component of Nigeria's public debt landscape. This category includes loans, bonds, and financial commitments owed to foreign entities, encompassing foreign governments, international financial institutions like the World Bank and International Monetary Fund, and commercial lenders from other nations. External borrowing often becomes necessary when domestic resources fall short of the funding required for critical infrastructure projects and other development initiatives. External debt can manifest in both concessional forms, featuring low-interest, long-term loans, and non-concessional forms, such as commercial loans with market-related terms. Prudent management of external debt is critical to avoid overreliance on foreign financing and to uphold fiscal sustainability (Central Bank of Nigeria, 2020).

In contrast, domestic debt includes various financial instruments issued within Nigeria's borders, such as government bonds, treasury bills, and bonds issued by state and local governments. These financial instruments are primarily employed to raise funds domestically when the government encounters budgetary deficits or seeks resources for specific projects. Managing domestic debt necessitates the issuance of securities with differing maturities and interest rates to optimize cash flow and sustain debt without causing disruptions in the financial system (Oyejide & Adenikinju, 2003). Effective management of domestic debt is essential for preventing liquidity crises and upholding financial stability (National Bureau of Statistics [NBS], 2021). In essence, public debt in Nigeria from 1990 to 2025 represents the financial commitments entered into by the government to address budgetary gaps and support essential development projects. It encompasses both external and domestic debt, and the prudent management of debt service obligations is pivotal for fiscal sustainability and the efficient utilization of borrowed funds for infrastructure development and overall economic growth.

Nigeria Debt Service

In Nigeria, the concept of debt service revolves around the consistent and periodic payments made by the Nigerian government to fulfil its financial commitments arising from both external and domestic debt. These payments encompass two primary components: interest payments and principal repayment. Interest payments represent the interest accrued on the outstanding debt, serving as compensation to lenders and bondholders for providing funds to the government. These interest payments are made at predetermined intervals, typically annually or semi-annually. Principal repayment, on the other hand, pertains to the repayment of the borrowed capital itself. Over time, as the government services its debt, it systematically repays portions of the initial borrowed amount. This repayment is structured according to amortization schedules, ensuring that the entire borrowed principal is repaid by the end of the debt's maturity (IMF, 2021). Within the Nigerian fiscal landscape, debt service holds a pivotal role. It constitutes a substantial portion of the government's annual budget and represents a non-negotiable obligation. Timely and consistent debt service is of paramount importance for maintaining the government's creditworthiness and access to international financial markets. Failure to meet these obligations can have severe repercussions, including credit rating downgrades, elevated borrowing costs, and potential defaults, all of which can inflict significant economic consequences.

Effectively managing debt service goes beyond merely making payments; it involves ensuring the sustainability of these payments without imposing excessive strains on the government's

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finances. This requires a delicate balancing act, where the government must allocate resources to meet its debt service obligations while simultaneously addressing other pressing financial commitments, including critical areas such as infrastructure development, healthcare, and education (IMF, 2021; Bello, 2002). Consequently, debt service in Nigeria is not isolated but interwoven with broader fiscal management strategies, shaping the government's approach to financial stability and economic management (Adeyemi & Adu, 2017a). In essence, debt service in Nigeria signifies the government's financial commitment to servicing its debt. It is an integral facet of the country's fiscal policy and economic governance, underscoring the importance of responsible financial management and resource allocation. Recognizing the significance of debt service is fundamental in comprehending Nigeria's financial landscape, where the efficient management of debt obligations plays a central role in the nation's economic sustainability and development (International Monetary Fund [IMF], 2021).

Theoretical Review

The study on the "Impact of Public Debt on Infrastructural Development in Nigeria (1990 - 2025)" is anchored in several theoretical frameworks and economic theories that provide a foundation for understanding the dynamics between public debt and infrastructure development. This theoretical review delves into key theoretical perspectives that underpin the study's research questions and objectives.

Debt Overhang Theory in Nigeria

Debt Overhang Theory suggests that when a country accumulates excessive public debt, it can lead to a situation where the government becomes hesitant to invest in capital expenditure, including infrastructure projects. Nigeria's experience aligns with this theory in several ways. During the 1980s and early 1990s, Nigeria faced a significant debt crisis. The country had borrowed heavily from international lenders, and a large portion of its budget was allocated to servicing external debts. This prioritization of debt servicing over critical sectors, such as infrastructure, constrained the government's ability to invest in vital projects (Ezeaku & Ohazurike, 2016). The burden of servicing external debts resulted in a scenario where resources that could have been channelled into infrastructure development were redirected to meet debt obligations. Consequently, the government's ability to invest in capital expenditure was significantly hampered.

Crowding Out Theory in Nigeria

The Crowding Out Theory is equally relevant to Nigeria's situation, particularly in the context of the specified model. This theory posits that government borrowing can lead to increased interest rates and reduced funds available for private investment. In Nigeria, as the government increasingly borrowed to finance budget deficits and infrastructure projects, it created upward pressure on interest rates. High interest rates can discourage private sector borrowing for investment purposes, including infrastructure development. This phenomenon is particularly relevant when the government allocates a significant portion of its resources to debt service (Adeyemi & Adu, 2017). As Nigeria grappled with servicing its public debt, the government's ability to invest in infrastructure was affected. The high cost of borrowing and limited resources left fewer funds available for capital expenditure. The Crowding Out Theory thus exemplifies how public debt servicing can reduce the availability of resources for infrastructure projects, potentially hindering the nation's efforts to address its infrastructure deficits.

Empirical Review

Henry (2023) determined the asymmetric and dynamic effects of public debt on private investment in Nigeria from 1990 to 2019. Because of the nature of data stationarity, the study then adopted the Nonlinear Autoregressive Distributed Lag (NARDL) modelling technique, which can produce both long-run and short-run parameter estimates of negative and positive decomposed values of domestic and foreign investment. The study used the Augmented Dickey-Fuller (ADF) test to ascertain the true order of integration for the study variables. The findings for the NARDL model showed a stable long-run cointegration among private investment, domestic debt, foreign debt, economic growth, inflation, and real exchange rate for the study period. The results show an asymmetric relationship between domestic and foreign debts and private investments in the long run. The estimated results further show that private investment is a significant positive function of positive and negative changes in foreign debt, and a significant negative function of positive and negative changes in domestic debt in the long run, while there was a significant instant positive on impacts on domestic and foreign debt shocks in the short run.

Yadav (2025) studied the impact of domestic debt on the economic growth of a country from 1995 – 2025. The study uses statistical and econometric techniques, including co-integration tests, Granger causality tests, and regression modeling, to assess the influence of internal debt on GDP growth. The findings indicate that domestic debt does not exert a statistically significant direct influence on economic growth, but it can result in financial instability when mismanaged. The analysis identifies problems like as deficits, interest payments, and the displacement of private sector investment. The findings indicate the necessity for robust debt management strategies, improved fiscal responsibility, and initiatives to reconcile inflation control with interest rate stability. By implementing these policies, policymakers can optimize the utilization of domestic debt while mitigating economic risks.

Iiyambo and Kaulihowa (2020) investigated the relationship between government expenditure, government revenue, and public debt in Namibia by employing the data of these variables for the period 1980 to 2018. An error correction model (ECM) was employed to analyze the short-run dynamics and a positive relationship between government expenditure and government revenue was found. Similarly, there was supporting evidence that an increase in public debt would stimulate government expenditure. The study recommended that policymakers should thoroughly review government expenditure and bring it to optimal levels to prevent the widening of public debt.

Aladejana *et al.* (2021) evaluated debt burden and implications for infrastructural development in Nigeria for the period 1986-2019. The study embraced annual time-series data and employed the Fully Modified Ordinary Least Squares (FMOLS) estimation techniques to examine the relationship between the variables. The findings revealed that both current and lagged coefficients showed a positive and significant relationship between domestic debt and infrastructural development, while the current and lagged coefficient of external debt showed a negative relationship with infrastructural development and was not statistically significant during the study period. The findings imply that increases in domestic debt of the federal government lead to an increase in Infrastructural development (in the short run) while federal government external debt hitherto has not resulted in any improvement in infrastructural development. The study concluded that the external debt has not contributed significantly to the

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development of Nigeria's infrastructure and that the huge external debt profile of Nigeria even before the debt forgiveness of 2005/2006 to date is not justifiable and is uncalled for. The study recommended that external loans should be restricted to specified identifiable infrastructural or productive projects.

Babatunde *et al.* (2020) investigated the impact of foreign debt on sustainable development goals in Nigeria. The research employed the standard Ordinary Least Square analytical technique. The study found that only foreign debt stock was statistically insignificant while the explanatory variables of foreign debt servicing and inflation, as well as the Gross Domestic Product, are found to be statistically significant. Nevertheless, from the OLS output, it was observed that the foreign debt stock coefficient contributes less. Again, the coefficient of foreign debt servicing contributes significantly to sustainable development goals in Nigeria. This means its significant contribution to the economy's sustainable goals. Also, the model is claimed to be freed from the serial correlation of residuals and there exists a direct correlation between the variables under investigation. The study concluded that despite the cost-benefit imbalance of sustainable development goals, the foreign debt portfolio continued to soar. provided that the negative effect of foreign debt far exceeds the benefit, it's apparent that external debt is distressing to the economy.

Literature Gap

Several noteworthy gaps and areas for further exploration emerge in this study. Most importantly, while the research acknowledges the historical context of Nigeria's public debt and its impact on infrastructure, it could benefit from more in-depth analyses of specific infrastructure sectors. A more granular examination of sectors such as transportation, energy, and healthcare would provide valuable insights into how different areas have been affected by public debt and may reveal sector-specific challenges and solutions. Also, the study predominantly focuses on the quantitative aspect of debt accumulation and capital expenditure, utilizing regression models and statistical analyses. However, it may lack a comprehensive exploration of qualitative factors influencing infrastructure development (Smith, 2015b). Factors such as governance, political stability, and the effectiveness of public institutions play pivotal roles in infrastructure projects' success. Exploring these qualitative dimensions could enhance the study's comprehensiveness.

METHODOLOGY

The research design for the study is meticulously structured to exclusively employ a quantitative approach, providing a comprehensive investigation into the intricate relationship between public debt and infrastructure. The research will initiate extensive and systematic data collection, focusing on historical information encompassing public debt metrics, capital expenditure allocations, and relevant economic indicators in Nigeria throughout the specified period. These data will be sourced from authoritative institutions, including the Central Bank of Nigeria, the National Bureau of Statistics, and international organizations, ensuring the integrity and reliability of the dataset.

The model for the study is expressed as:

$$CAPEX_t = \alpha_0 + \beta_1 EXD_t + \beta_2 DD_t + \beta_3 DSt + \epsilon_{it} \dots\dots\dots \text{eqn. (i)}$$

The model can be explained as follows:

CAPEX_t: This represents Capital Expenditure in a specific year (t); **EXD_t**: This represents the External Debt in a specific year t; **DD_t**: This represents the Domestic Debt in a specific year t; **α_0** : This is the intercept or constant term in the regression equation; **β_1 - β_3** : This is the regression coefficient associated with the variables EXD_t, DD_t & DS_t; **cit**: This represents the error term in the regression equation.

RESULTS AND DISCUSSION

In this section, data are presented in tabular and graphical form and the analysis.

Table 4.1: *Descriptive Statistics*

	LOGCAPEX	LOGEXD	LOGDD	LOGDS
Mean	6.055717	7.380992	7.584076	5.629123
Median	6.314272	7.235138	7.469232	5.895808
Maximum	7.735869	9.449800	9.681836	8.091160
Minimum	3.180077	5.699153	4.431925	2.965286
Std. Dev.	1.239291	1.132945	1.539013	1.549729
Skewness	-0.890108	0.281832	-0.261207	-0.084941
Kurtosis	2.912091	1.713733	1.996900	1.857057
Jarque-Bera	4.368230	2.711775	1.758797	1.835870
Probability	0.112577	0.257718	0.415032	0.399343
Sum	199.8387	243.5728	250.2745	185.7611
Sum Sq. Dev.	49.14692	41.07409	75.79399	76.85317
Observations	33	33	33	33

Source: *Author's computation Using EViews-10*

The above Table 3.1 describes the behaviour of the variables, and normality with Jarque Bera (JB) test considering the Skewness value, Kurtosis value, JB, and P-value for the normality decision. The table shows that the Capital expenditure (LOGCAPEX) mean value of 6.055717, with a standard deviation (SD) of 1.239291. This is an indication that the CAPEX deviates from both sides of the mean by 1.239291, which means that the data is widely dispersed from its mean. The CAPEX also has a minimum and maximum value of 3.180077 and 7.735869 respectively. The data for CAPEX is negatively skewed with a coefficient of -0.890108, meaning that most of the data falls on the left side of the normal curve. The kurtosis coefficient of 2.912091, approximately 3 shows that the data is normally distributed with a JB value of 2.7117 and its P-value of 0.1125 which is (11.25%). It means when the P-value of JB is greater than 0.05 (i.e., 5%), the variable is said to be normal in behaviour.

The table shows that the External debt (LOGEXD) mean value of 7.380992, with a standard deviation (SD) of 1.132945. This is an indication that the EXD deviates from both sides of the

mean by 1.132945, which means that the data is widely dispersed from its mean. The EXD also has a minimum and maximum value of 5.699153 and 9.449800 respectively. The data for EXD is negatively skewed with a coefficient of 0.281832, meaning that most of the data falls on the right side of the normal curve. The kurtosis coefficient of 1.713733, approximately 2 with a JB value of 4.3682 and its P-value 0.2577 which is (25.77%). It means when the P-value of JB is greater than 0.05 (i.e., 5%), the variable is said to be normal in behaviour.

The table shows that the Domestic debt (**LOGDD**) mean value of 7.584076, with a standard deviation (SD) of 1.539013. This is an indication that the CAPEX deviates from both sides of the mean by 1.539013, which means that the data is widely dispersed from its mean. The DD also has a minimum and maximum value of 4.4319253 and 9.681836 respectively. The data for DD is negatively skewed with a coefficient of -0.261207, meaning that most of the data falls on the left side of the normal curve. The kurtosis coefficient of 1.996900, approximately 2 with a JB value of 1.835870 and its P-value of 0.4150 which is (41.50%). It means when the P-value of JB is greater than 0.05 (i.e. 5%), the variable is said to be normal in behaviour.

The table shows that the Debt servicing (**LOGDS**) mean value of 5.629123, with a standard deviation (SD) of 1.549729. This is an indication that the DD deviates from both sides of the mean by 1.549729, which means that the data is widely dispersed from its mean. The DD also has a minimum and maximum value of 2.965286 and 8.091160 respectively. The data for DD is negatively skewed with a coefficient of -0.084941, meaning that most of the data falls on the left side of the normal curve. The kurtosis coefficient of 1.857057, approximately 2 with a JB value of 4.3682 and its P-value of 0.399343 which is (39.93%). It means when the P-value of JB is greater than 0.05 (i.e. 5%), the variable is said to be normal in behaviour.

Unit Root Test

Table 4.2: *Augmented Dickey-Fuller Test Result*

Variables	At Levels			At First Difference			Order of Integration
	ADF	5% CV	Prob.	ADF	5% CV	Prob.	
LogCAPEX	-2.4233	-3.5578	0.3614	-4.3666	-3.6220	0.0111	I(1)
LogEXD	-2.1689	-3.5629	0.4893	-3.9557	-3.5629	0.0213	I(1)
LogDD	-2.1057	-3.5578	0.5232	-3.8266	-3.5629	0.0284	I(1)
LogDS	-2.1359	-3.5950	0.5031	-5.2851	-3.5950	0.0012	I(1)

Source: *Author's computation Using EViews-10*

The Table 4.2 shows that all the variables only became stationary at first difference as indicated by the absolute values of the ADF statistics of all the variables which were above the critical values at a 5% level of significance.

Table 4.3: Co-integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.655948	10%	2.01	3.1
K	3	5%	2.45	3.63
		2.5%	2.87	4.16
		1%	3.42	4.84

Source: *Author's computation Using EViews-10*

From the Table 4.3, the F-statistic value of 4.655948 is greater than the lower I(0) and upper I(1) bounds critical values of 2.45 and 3.63 respectively at the 5% significance level. It can therefore be inferred that the variables are co-integrated and as such, there is a long-run equilibrium relationship between them.

Table 4.4: Short-run Result

ECM Regression					
Case 1: No Constant and No Trend					
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
D(LOGDS)	-0.360889	0.104920	-3.439654	0.0019	
CointEq(-1)*	-0.280238	0.061605	-4.548967	0.0001	
R-squared	0.344855	Mean dependent var		0.135260	
Adjusted R-squared	0.323017	S.D. dependent var		0.322849	
S.E. of regression	0.265637	Akaike info criterion		0.247091	
Sum squared resid	2.116894	Schwarz criterion		0.338700	
Log likelihood	-1.953461	Hannan-Quinn criter.		0.277457	
Durbin-Watson stat	2.141082				

* p-value incompatible with t-Bounds distribution.

Source: *Author's computation Using EViews-10*

As expected, the lagged coefficient of the Error Correction Term is negative, less than one, and statistically significant at 5% (as captured by -0.280238; and pv of 0.0001). This means that once there is disequilibrium in the system, it will take an average (annual) speed of 28.0238% to restore the long-run relationship (i.e. Speed of adjustment).

Table 4.5: Long-run Result

Levels Equation				
Case 1: No Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGEXD	0.174101	0.190449	0.914162	0.3687
LOGDD	1.054141	0.336512	3.132553	0.0041
LOGDS	-0.491183	0.368210	-1.333975	0.1934

Source: *Author's computation Using EViews-10*

The long-run result shows that LogEXD has a positive and insignificant relationship with LogCAPEX, while LogDD has a positive and significant relationship with LogCAPEX. Also, LogDS has a negative and insignificant relationship with LogCAPEX.

Results of Diagnostic Tests

The study applied numerous diagnostic tests to the ARDL model. There is no evidence of either serial correlation or Heteroscedasticity as shown by Breusch-Godfrey LM and Breusch-Pagan-Godfrey Tests probability values in tables 4.6 and 4.7 respectively. The residuals are normally distributed as shown by the Jarque-bera probability value in Table 4.8. The CUSUM and CUSUMSQ tests in tables 4.9 and 4.10 respectively, show that the model is stable and the regression equation is correctly specified as the plots of the charts lie within the critical bounds at 5% significance level.

Table 4.6: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.118327	Prob. F(2,25)	0.8889
Obs*R-squared	0.300076	Prob. Chi-Square(2)	0.8607

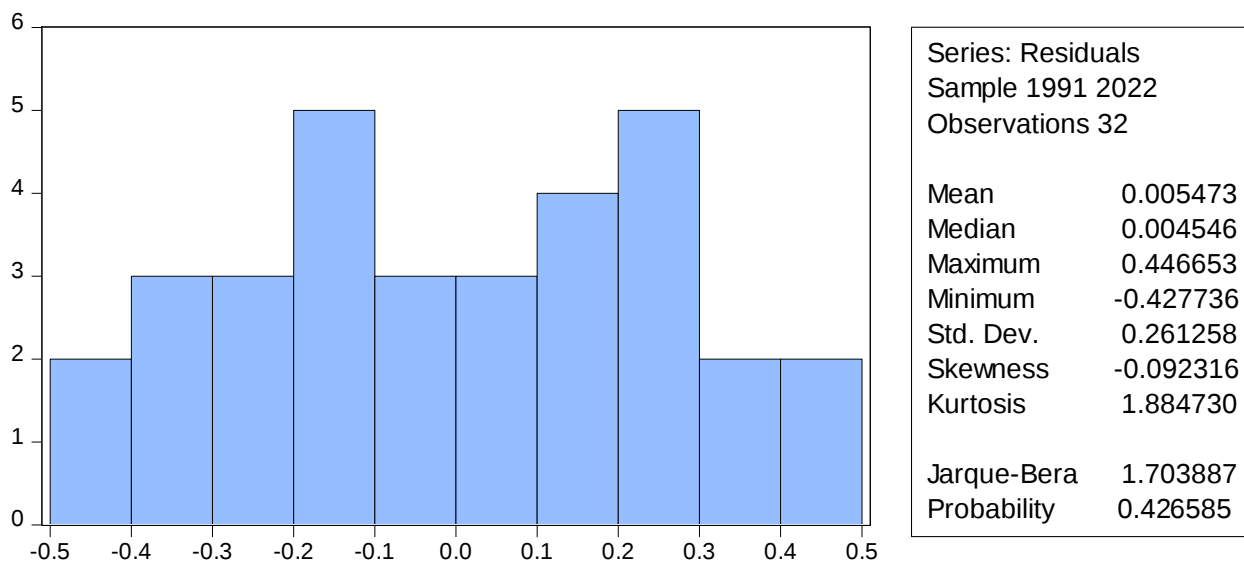
Source: *Author's computation Using EViews-10*

Table 4.7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.158130	Prob. F(5,26)	0.3560
Obs*R-squared	5.828782	Prob. Chi-Square(5)	0.3232
Scaled explained SS	1.821437	Prob. Chi-Square(5)	0.8733

Source: *Author's computation Using EViews-10*

Figure 4.1: Jarque-Berra



Source: Author's computation Using EViews-10

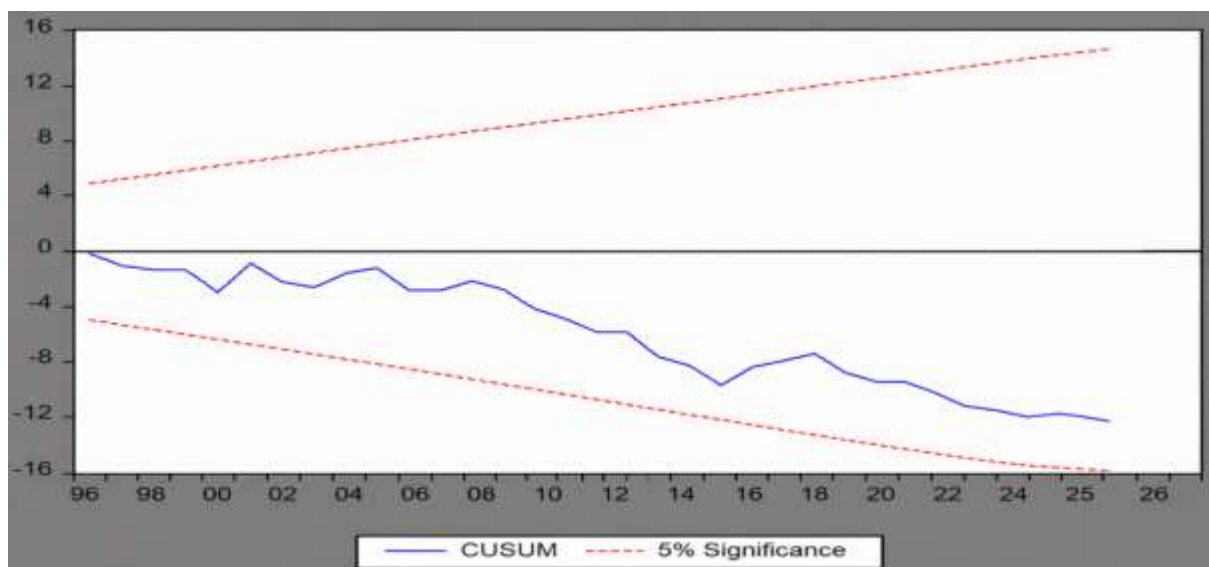


Figure 4.2: Cumulative Sum of Recursive Residual Test

Source: Author's computation Using EViews-10

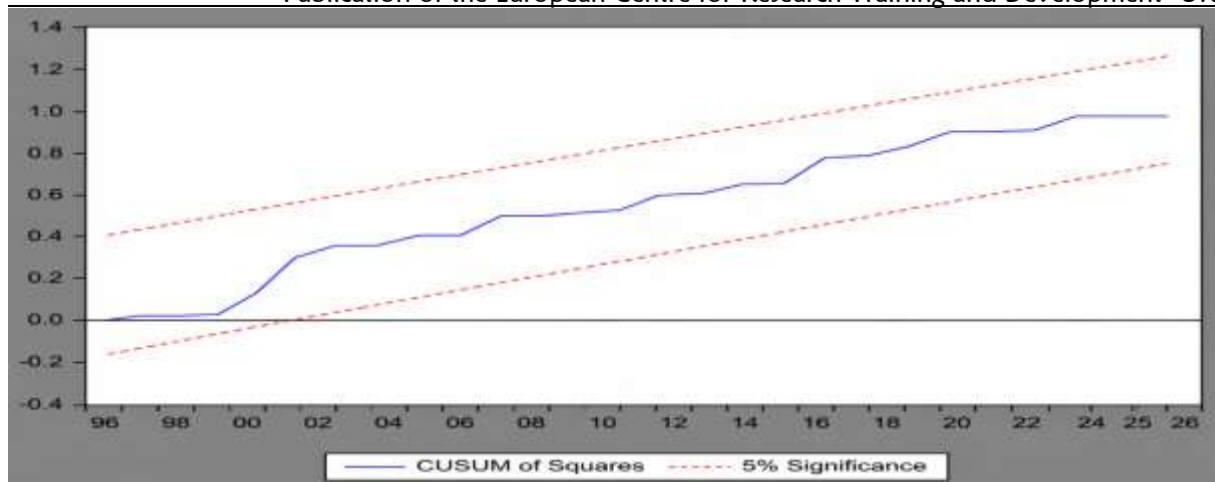


Figure 4.3: Cumulative Sum of Squares Recursive Residual Test Result

Source: Author's computation Using EViews-10

CONCLUSION AND RECOMMENDATIONS

This section discusses the findings, conclusion, recommendations, and suggestions for further study.

To what extent does external debt (LogEXD) influence capital expenditure (LogCAPEX)?

The estimated result obtained from the Autoregressive Distributed Lag Model (ARDL) reveals that LogEXD has a positive and insignificant relationship with LogCAPEX in Nigeria from 1990 to 2025. This implies that a 1 percent increase in EXD will lead to about 0.174101 percent increase in CAPEX. The outcome is in tandem with the a-priori expectation that external debt has a positive relationship with capital expenditure (infrastructural development). However, it is insignificant because of mismanagement and misplacement of priority & political will. The study outcome is consistent with the study Babatunde *et al.* (2020) that foreign debt insignificantly contributed to sustainable development goals (SDGs) in Nigeria.

How does domestic debt (LogDD) affect capital expenditure (LogCAPEX)?

LogDD has a positive and significant relationship with LogCAPEX over the specified timeframe. This implies that a 1 percent increase in DD will lead to about 1.054141 percent increase in CAPEX. The outcome is in tandem with the a-priori expectation that domestic debt has positively and significantly impacted capital expenditure (infrastructural development). Furthermore, the study outcome is consistent with Aladejana *et al.* (2021) that domestic debt has a positive and significant impact on infrastructural development in Nigeria.

What is the impact of debt service (LogDS) on capital expenditure (LogCAPEX)?

LogDS has a negative and insignificant relationship with LogCAPEX in Nigeria during the study period (1990 - 2025). This implies that a 1 percent increase in DS will lead to about 0-0.491183 percent decrease in CAPEX. The study outcome agrees with the findings of Babatunde *et al.* (2020) that foreign debt servicing insignificantly affected sustainable

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development goals (SDGs) in Nigeria. The outcome is in tandem with the a -priori expectation that debt servicing has a negative relationship with capital expenditure (infrastructural development). However, it is insignificant because of possible diversion, delays in capital project execution, and corruption to siphon public funds. Moreover, domestic debt formed the larger proportion of the debt profile in Nigeria which ought to have reduced the burden and affected capital expenditure significantly.

The study concludes that there exists a positive relationship between EXD and DD on CAPEX, while there is a negative relationship between DS and CAPEX. Furthermore, EXD and DS are insignificantly affected by CAPEX while DD has a significant effect on CAPEX.

Based on the findings, the following recommendation were made for the study:

Firstly, EXD shows a positive relationship to CAPEX while it is not significant due to lack of financial prudence and monitoring. It advises adhering to due diligence and ensuring value for money in capital project management. Secondly, it is recommended that more domestic debt should be borrowed to finance capital expenditure because it was empirically established that such enhances infrastructural development in Nigeria at a lower cost devoid of foreign currency fluctuations. Lastly, effective monitoring and execution of capital projects is advised to reduce the debt servicing burden, and incentives to domestic creditors and financials to reduce external borrowing.

Suggestion for Further Studies

This present study is domiciled at the federal level; further research is encouraged on a state-by-state basis analysis or geo-political basis.

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