Public Debt and Economic Performance of Nigeria: A VECM Analysis

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ABSTRACT

Public debt has been a veritable fiscal tool for governments worldwide to finance public expenditure and stimulate economic growth. This study investigates the impact of public debt—comprising domestic and external debt—on Nigeria's economic performance from 1981 to 2022. Employing a vector error correction model (VECM) alongside causality analysis, the research examines both the short- and long-term relationships between different debt types and economic growth. Descriptive and inferential statistics, including stationarity tests and Cointegration analysis, were used to analyze the data obtained from the Central Bank of Nigeria and Debt Management Office. The findings indicate that external debt exerts a positive and significant influence on Nigeria's economic performance, primarily when allocated to productive sectors. Conversely, domestic debt exhibits a negative and significant relationship, likely due to crowding-out private investment and fiscal strains. The study emphasizes the need for strategic debt management and allocation policies to sustain economic growth. Recommendations include aligning borrowing with productive investments, maintaining debt sustainability thresholds, and ensuring efficient utilization of borrowed funds to foster Nigeria's long-term economic stability and development.

Keywords: Cointegration, Economic Growth, Public Debt, External debt, Domestic debt

INTRODUCTION

Public debt, often referred to as government debt or national debt, is a critical financial tool used by countries worldwide to finance economic activities, infrastructure projects, and social programs. Oladipo et al. (2020) avers that the necessity for external borrowing emerged when limited public funds hindered the ability to finance national development projects, as capital accumulation enhances productivity, ultimately driving economic growth. While excessive debt can pose economic risks, moderate and well-managed public debt is essential for national development, economic stability, and growth. Public debt plays a pivotal role in shaping a nation's economic trajectory, serving as a tool for financing development projects and addressing budget deficits. In Nigeria, the dynamics of public debt have been a subject of extensive analysis, especially concerning their impact on economic performance. Historically, Nigeria's debt profile has experienced significant fluctuations, with notable increases in the 1980s and early 2000s, leading to various economic challenges which has profoundly influenced the nation's economic landscape. For instance, in 1987, the country's total debt rose by 96.9%, reaching N137.58 billion, and by 2004, it escalated to N6,188.03 million (Essien, et al, 2016). Public debt is a critical instrument for governments to finance development projects and manage budget deficits. The debt accumulation in the 1980s and early 2000s therefore needed comprehensive policy responses.

Public debt proliferation suffered by numerous developing countries has attracted global attention; this experience which is occasioned by the fall in oil prices, exchange rate volatility, increasing financing costs

etc. have negatively affected the economies of developing economies around the world, especially the Nigerian economy (Favour, Ideniyi, Oge and Charity, 2017). Debt or loans have been described as an important fiscal policy tool available to the government to finance national development and ultimately increase productivity and enhance economic growth. (Muhammad, Ruhaini, Nathan, & Arshad, 2017).

The relationship between public debt and economic growth is complex and multifaceted especially in a developing country like Nigeria. While some studies suggest that external debt can positively influence economic growth, others highlight the potential adverse effects of domestic debt on the economy. For example, recent research indicates that external debt positively impacts economic growth, whereas domestic debt may retard growth asymmetrically in the short term and linearly over the long term (Oladotun and Olanipekun, 2024).

Nigeria's debt profile is made up of both external and domestic debt. Domestic debt is contracted in Nigeria, usually through bonds and government bonds while external debts also known as foreign debt are typically owed to foreign creditors. These are multilateral agencies such as the Africa Development Bank, the World Bank, or the Islamic Development Bank, and bilateral agencies such as the China Exim Bank, the French Development Bank, or the Japanese Aid Agency. Borrowing by countries is occasioned by inability to raise enough revenue from local sources for the administration of government business as observed by (Essien et al, 2016) which is meant to accelerate economic growth and development of a country. Chinanuife, Eze, and Nwodo (2018), avers that the practice of borrowing is not bad, if borrowed fund is used judiciously. However, the Nigerian situation have been marred with corrupt practices leading to overwhelming debt overhang almost choking the nation.

In recent years, Nigeria has undertaken significant economic reforms to address its debt challenges and stimulate growth. Key measures include unifying exchange rates to prevent losses from oil proceeds and cutting regressive petrol subsidies to fortify public finances and stabilize the naira. These reforms aim to create a more sustainable economic environment, reduce reliance on debt, and enhance overall economic performance. This study aims to critically examine the intricate relationship between public debt and economic performance in Nigeria. By analyzing recent data and evaluating the outcomes of implemented economic reforms, the research seeks to provide insights into how public debt influences economic growth and development in the Nigerian context. In examining this relationship the study is premised on the broad objective to assess the effect of government debt on the economic growth in Nigeria with specific objective including to: examine how domestic debt impact on the Economic Growth in Nigeria., (2) determine the impact of external debt on the Economic growth in Nigeria and to ascertain the effect of debt servicing on the economic growth in Nigeria.

LITERATURE REVIEW

Public debt, defined as the total amount of money that a government owes to external creditors, has been a focal point of economic discourse, especially in the aftermath of global financial crises and the COVID-19 pandemic. The relationship between public debt and economic growth is complex and multifaceted, with varying implications depending on a country's economic status, debt levels, and external economic conditions. Public debt is an important instrument for governments to fund public spending, particularly when it is difficult to raise taxes and reduce public expenditure.

Economic theories present divergent views on how public debt influences growth. Some argue that moderate levels of public debt can stimulate economic activity by financing infrastructure, education, and other public goods that enhance productivity. Conversely, excessive debt may lead to higher interest rates, crowding out private investment, and potentially triggering fiscal crises as spelt out by the debt overhang theory notably developed by Krugman (1988) and Sachs (1989). The theory posits that if a country's debt exceeds its future capacity to repay, any new income or investment is effectively taxed by creditors. Misztal (2021) noted that public debt does not have to be detrimental to the economy. It was noted that an increase in public debt could either increase or decrease prosperity depending on the situation. The seminal work by Reinhart and Rogoff

(2010) suggested that when a country's gross external debt exceeds 90% of its GDP, economic growth rates tend to decline significantly. However, subsequent critiques have questioned the universality of this threshold, emphasizing the need for context-specific analyses.

Recent empirical studies offer different insights into the debt-growth nexus. Kikuchi and Tobe (2021) analyzed data from 50 countries between 1997 and 2015, finding a positive correlation between foreign debt and GDP growth. Their study indicates that foreign debt can enhance investment and subsequent economic growth, particularly in OECD countries. Similarly, a study focusing on the G7 nations highlighted that the impact of public debt on economic growth varies across different income levels, necessitating tailored policy approaches (Kikuchi & Tobe, 2021).The heterogeneity in findings underscores the importance of context-specific policy formulations. For lower-middle-income countries, public debt can serve as a tool to spur economic growth, provided it is managed prudently and invested in growth-enhancing sectors. In contrast, advanced economies with high debt levels might need to focus on fiscal consolidation to prevent potential negative effects on growth. Moreover, the global economic landscape, including factors like interest rates and investor confidence, plays a crucial role in determining the sustainability of public debt.

Domestic debt and Economic growth in Nigeria

The relationship between domestic debt and economic growth in Nigeria is complex and context-dependent. While it can serve as a tool for economic development, excessive and poorly managed debt undermines growth prospects. Domestic debt are liabilities that a government owes to its residents typically in the form of treasury bills, bonds and other debt instruments issued by the central bank. In Nigeria, domestic debt has been a significant component of public debt often employed to finance deficit budgets, infrastructural development and economic stimulus. The relationship between domestic debt and economic growth, however, remains a topic of scholarly debate and policy relevance as it depends on the size, structure, utilization, and management of the debt. Domestic debt when well-managed can finance productive investments, enhance capital accumulation and stimulate aggregate demand. At the same time, excessive domestic debt can crowd out private investment, increase interest rates, trigger inflation and lead to debt overhang all of which may hinder growth. According to Debt Management Office (DMO, 2024) Nigeria's total domestic debt stood at N38.4trillion as of December 2023 and domestic debt constitute over 60% of Nigeria's total public debt. This calls for an investigation, hence we hypothesize that domestic debt has no significant impact on economic growth in Nigeria.

External debt and Economic Growth in Nigeria

External debt on the other hand refers to the portion of a country's debt borrowed from foreign lenders, including commercial banks, governments or international financial institutions. External borrowings has been a significant tool for infrastructure finance, budget deficit finance economic growth stimulation. The relationship between external debt and economic growth has shown different results. Some studies have found that external debt can positively influence economic growth both in the short and long run while others have indicated that external debt has a negative relationship with economic growth often due to mismanagement and inefficient use of borrowed funds. We thereby hypothesized that external debt has no significant impact on economic growth in Nigeria.

Debt Servicing and Economic Growth in Nigeria

This is the repayment of principal and interest on public debt and has become a significant fiscal concern in Nigeria. As the country grapples with rising debt obligations, understanding the implications of debt servicing on economic growth is crucial for policymakers and stakeholders alike. The debt overhang hypothesis suggest that high debt levels may discourage investment, as potential returns are perceived to be taxed away to service existing debt. A study by Amoo (2024) using the ARDL model found that while external debt positively influences real GDP, debt servicing has a significant negative correlation with economic performance. This suggests that rising debt service obligation adversely affect economic growth. To further provide empirical

evidence to this claim, we hypothesize that debt servicing has no significant impact on economic growth in Nigeria.

Empirical Review

The link between public debt and economic growth is one of the macro-economic issues that has been intensely debated by economists worldwide due to its economic and social implications, as well as its complexity. There have been several empirical studies conducted on the effects of public debt on economic growth around the world including Nigeria. The following is an overview of some of the relevant empirical reviews both from developed and emerging economies

Otieno (2024) utilized a novel spatial econometrics methodology to examine the spill-over effects of foreign public debt and foreign direct investment (FDI) on the economic growth dynamics of Eastern Africa. Specifically, the Spatial Durbin Fixed Effect (SDM-FE) Model was employed, utilizing balanced panel data sourced from the World Development Indicators (WDI) covering the years 1992 to 2019. The study enhances the existing literature by incorporating a spatial weight matrix and exploring its interactions with economic growth alongside various macro-regional factors, thereby revealing the existence of spatial spill-over effects and the significance of geographical proximity among countries in the region. The findings demonstrate that foreign public debt, FDI, gross fixed capital formation, human capital development, inflation, and government expenditure exert significant spatial spill-over effects on regional economic growth. Furthermore, the results highlight the phenomenon of regional growth divergence and provide compelling evidence of considerable regional spatial dependence in economic growth. These findings indicate that foreign public debt adversely affects economic growth, aligning with the debt overhang theory and the crowding-out hypothesis.

Onofreil et al. (2022) examined the short- and long-term effects of public debt on economic growth in EU countries, using data that covers a period of 25 years (1995–2019). For public debt was proxy as general government gross debt (as a percentage of GDP), while for economic growth, the real GDP per capita growth rate was used. The models included a set of control variables to highlight the impact of other determinants on economic growth. Several econometric methodologies related to ARDL (autoregressive distributed lag models), such as the pooled mean group (PMG), the mean group (MG), and the dynamic fixed effects (DFE) models were utilized in the study. The results of the study show that in both the short and long term, an increase in public debt is negatively and significantly associated with economic growth. Specifically, in both the short- and long-term analyses, the estimated coefficients of public debt were statistically significant and negative, while the magnitude of the negative impact on economic growth differed. They advised for both the rigorous monitoring of the level of public debt and the control of public allocation to support economic growth to be of major importance.

Liu and Lyu (2021) found out that there is a non-linear relationship between public debt and economic growth, both in developing and emerging countries, and in developed countries. However, the debt threshold differs from one country to another, depending mainly on the current account balance, gross savings, crisis, and the degree to which the economy is opened. Siong et al. (2021) using a dynamic panel threshold technique, provided new evidence on the threshold value of the ratio of public debt to the gross domestic product in seventy-one developing countries from 1984 to 2015. Debt has a negative and statistically significant impact on economic growth at a high level of public debt but an insignificant effect at a low level of public debt. The findings also reveal that better institutions tend to minimize the negative impact of public debt on economic growth. For further robustness checks, different estimations, without outlier sample countries, and panel quantile regression were used and the findings are unaltered.

Onyewife et al. (2023) assessed the effect of public debt on economic growth in Nigeria from a two pronged approach. Disaggregating debt into bank sourced debt and non-bank sourced debt. They appraised the implication of public debt on growth in the tradable sector and in the non-tradable sector for the period of 1981-2021. The study concluded that different elements of public debt have varying impacts on the growth of the tradable sector. External debt and debt obtained from non-bank sources positively drive the growth of the

tradable sector. However, debt acquired from banks and the associated servicing costs hurt the growth of the tradable sector. Furthermore, the different components of public debt have varying impacts on the growth of the non-tradable sector. Specifically, foreign debt and debt obtained from non-bank sources have a significant positive influence on the growth of the non-tradable sector. The influence of debt acquired from banks on the non-tradable sector is positive but insignificant. However, similar to the tradable sector, the servicing of debt undermines the growth of the non-tradable sector
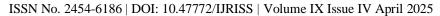
Obadiaru and Onovughe (2022) examine the relationship between public debt and economic growth in Nigeria. The model was estimated using the ARDL (Autoregressive Distributed Lag) method. The sample size was 30 years, covering the years 1990-2020. Their research showed that public debt has a short-term negative effect on economic growth, but the long-term relationship was found to be insignificant. John, Fedir, Maxim, Banchuk-Petrosova and Olena (2022) concluded that government consider more domestic borrowing than foreign borrowing, which is used only when necessary when they examined the short and long term effects of public debt on economic growth in Nigeria. The model was estimated for longitudinal study co-integration using autoregressive distributed lag constraints. The data was collected from the Central Bank of Nigeria Statistical Bulletin and Annual Reports and covered the years 1991-2020. The findings reveals that all explanatory variables were statistically significant. In particular, economic growth is significant and responds negatively to changes in external debt by 0.19 percent and in debt service by 0.07 percent, in contrast to positive responses to changes in domestic debt and by 0.18 percent to changes in exchange rates.

Adegbie, Otitolaiye, Aguguom and Ajayi (2022) suggested that appropriate measures should be put in place to ensure that the borrowed funds are optimally invested in productive projects in Nigeria. This assertion was arrived at from their study on the relationship between public debt management and economic growth in Nigeria. A retrospective study design was used for time series data on relevant macroeconomic variables. They found that public debt service (RGDP) had a significant positive impact on economic growth in Nigeria.

Sani and Sunday (2021) examined the impact of public debt on economic growth in Nigeria. Their review revealed that borrowing has negatively affected the growth of the Nigerian economy. Diversifying the country's economy from oil to non-oil sectors, creating an enabling environment for businesses to thrive and curbing the menace of financial outflows and corruption are some of the recommendations of the study to curb the growth of Nigeria's public debt. Nwakanma and Iwuji (2021) used dynamic analysis to examine the relationship between public debt and economic growth in Nigeria between 1981 and 2019. Their research showed that public debt has a negative impact on economic growth. Their study found that high levels of public debt could hamper Nigeria's economic growth.

Adegbite, Adeleke and Olowolaju (2021) found a positive relationship between public debt and economic growth in Nigeria using a VAR model to analyze data from 1981 to 2019. They argued that public debt could promote economic growth through investment. in infrastructure and social services. Onyele and Nwadike (2021) examine the impact of government debt on economic stability in Nigeria. The study covered the period 1981-2019 and annual data was obtained from World Development Indicators and Central Bank of Nigeria Statistical Bulletin, 2019. The analysis used an ARDL (Autoregressive Distributed Lag) model because the variables are stationary at both levels and first difference. . The ARDL estimation shows that the explanatory variables together have a long-run decreasing effect on economic stability, and that income adequacy has a negative and significant effect. In the short run, all components of the debt burden, except the debt surplus, have a negative and significant impact on the stability of the economy. In such a situation, the exchange rate has a positive and significant effect on the stability of the economy in the long term.

Iteh and Oyeanu (2021) avers that policy makers should adhere to the proper use of debt by making effective investments to promote economic growth and avoid excessive accumulation of debt after examining the impact of external debt on economic growth in Nigeria from 1985 to 2018 using a vector autoregression (VAR) approach. Empirical results showed that both external debt balance and external debt management had a negative and significant impact on economic growth. These results led to the fact that when the external debt

balance changed by one unit, economic growth slowed down by 0.495 units. In contrast, if the external debt service changed by one unit, economic growth slowed down by 0.017 units.

Opara, Nzotta and Kanu (2021) observed that government should be careful with its domestic borrowing policy as debt servicing always becomes a burden on the sustainability of economic gains and also tends to crowd out private sector investment in Nigeria. This was the conclusion after examining the impact of Nigeria's national debt on Nigeria's economic development between 1981 and 2018. The used ordinary least square regression to determine the statistical relationship between Nigeria's public debt profile and human development index and private sector investment. The result of the first model study showed that internal debt management and the internal debt of state governments are significantly related to economic development. On the other hand, federal domestic debt and state domestic debt are significantly related to private sector investment. Ezenwobi and Anisiobi (2021) investigated the impact of government borrowing on economic development in Nigeria. The study covered the period 1990 to 2020, with annual data obtained secondarily from the database of World Development Indicators (2020) and the CBN Statistical Bulletin, analyzed using multiple regression models with Augmented Dickey-Fuller (ADF) unit root test, Johansen. co-integration and an error correction mechanism (ECM). The study used external debt (EXD), domestic debt (DOD), interest rate (INTR) and inflation (INF) as independent variables, while human development index (HDI) was used as dependent variable and development descriptive variable. The result showed a positive statistically significant relationship between external debt and the economic development of Nigeria, while interest rates have a negative statistically significant relationship with the economic development of Nigeria.

Chukwuemeka and Samuel (2021) examine the impact of public debt on economic growth in Nigeria. Annual data series for the variables used in the study were obtained from the Central Bank of Nigeria for the years 1981–2019. The unit root test was performed, and the results showed that the variables were stationary, although at different levels. The co-integration test was also performed using Johansen's co-integration method and the result showed that the variables in the model were co-integrated, that is, the variables have a long-term relationship. The error correction mechanism showed that the coefficient of multiple determination (R^2) was 0.890,783 in the over parametric model, while it was 0.846548 in the parsimonious model. The short-run regression result showed that external debt has a negative and insignificant effect on economic growth in Nigeria. The short-term result also showed that domestic debt has a positive and significant effect on Nigeria's economic growth, while loans to the private sector have a negative and insignificant effect on Nigeria's economic growth. The result of the long-term dynamic analysis showed that external debt has a negative and insignificant effect on Nigeria's economic growth, while domestic debt has a positive and significant effect on Nigeria's economic growth. Long-run dynamic analysis also showed that credit to the private sector has a positive and significant impact on economic growth in Nigeria. The report recommended that the government reduce the amount of foreign borrowing it needs to finance its operations. Domestic debt should be properly managed by channelling it into activities that stimulate economic growth.

METHODOLOGY

Data for this study was obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and Debt Management Office Website of Nigeria. The data was considered adequate and relevant for the study because the Central Bank of Nigeria (CBN), which collected the data, is the apex banking institution in Nigeria with regulatory and supervisory powers. The country's financial institutions submits annual report of their activities to the CBN. Researchers can access these reports and other information on the CBN website or by contacting CBN directly. Using this CBN data, researchers can obtain high quality and reliable data on the Nigerian economy that can help identify the impact of public debt on Nigeria's economic growth. As a result the design employed for the study was the causal comparative research design, to investigate the cause and effect relationship by analysing existing conditions or past events without manipulating independent variables. The data set include time series data of Real Gross Domestic Product (RGDP), External Debt (ED) and Domestic Debt (DB) for the period 1981-2022. An econometric model was stated to define the relationship subsisting among the variables of study for the purpose of analysis.

Model Specification

To attain the objectives of this study, the following functional models were formulated:

EG=f (Government debt)

$$RGDP = bo_t + b_1 ED_t + \mu_t$$

$$RGDP = bo_t + b_1\ DD + \mu_t$$

$$RGDP = bo_t + b_1 DS_t + \mu_t$$

Where,

ED = External debt

DD = Domestic debt

DS = Debt servicing

EG = Economic growth

RGDP = RGDP growth rate

μ = error term

b_0, b_1, b_2 = parameters of the variables

Data Analysis Technique

Data were analyzed using descriptive statistics and inferential statistics. The descriptive statistics summarized data using measures such as mean, median, mode, standard deviation, and range in a meaningful way. Conclusions were drawn on the population based on the sample size testing hypotheses and with regression analysis. Some other pre-estimation test were conducted such as Unit Root Test used to determine whether the time series data was stationary or not. If the data were not stationary, they were transformed before applying other statistical methods. The result of the unit root test showed that all variables were stationary at the first difference, so we had to perform a co-integration test to determine the long-run relationship between the variables of interest.

FINDINGS AND DISCUSSION

Descriptive Statistics

The descriptive statistics for both the dependent and independent variables are presented in table 1.

Table 1: Descriptive Statistics

	LOGRGDP	LOGRCEXP	LOGEXD	LOGDMD	LOGCEXP	DS__GNI
Mean	4.520136	2.507452	2.803188	2.865178	0.400766	2.648780
Median	4.430322	2.762904	2.812120	3.007310	0.421604	2.000000
Maximum	4.865594	3.909644	4.200173	4.284263	0.958086	6.500000
Minimum	4.209823	0.676694	0.367580	1.048931	-0.193820	0.100000
Std. Dev.	0.232011	1.071495	0.904044	0.977108	0.277797	2.085800
Skewness	0.266564	-0.378365	-0.859062	-0.312032	-0.210171	0.480223

Kurtosis	1.496489	1.740256	3.308167	1.894439	2.192075	1.830120
Jarque-Bera	4.347315	3.689307	5.205151	2.753355	1.416943	3.913919
Probability	0.113761	0.158080	0.074083	0.252416	0.492396	0.141287
Sum	185.3256	102.8055	114.9307	117.4723	16.43142	108.6000
Sum Sq. Dev.	2.153155	45.92409	32.69184	38.18963	3.086846	174.0224
Observations	41	41	41	41	41	41

Source: Authors output from E-views 10

The result in table 1 is the descriptive or summary statistics of both the dependent and the independent variables in their logged values employed in the study (RGDP, DMD, EXD, RCEXP, CEXP and DS). The summary statistics were used to compare the measures of central tendency, the measures of dispersion and the measure normality of the data set. The central tendency measure compares the mean and the median values of the data set. From the results we observe that the mean values of RGDP, RCEXP, DMD, EXD, CEXP and DS were 4.520136, 2.507452 2.865178, 2.803188, 0.400766, 2.648780 respectively. The measure of dispersion which measures how widely spread the dataset was from the mean value is indicated by the minimum, maximum, and standard deviation values. Their values are as shown in table 4.1. The test for normality measures whether the data set is normally distributed or otherwise. These measures include the values of skewness and kurtosis. The skewness measures the degree of asymmetry of the data set whether they are normally skewed, positively skewed or negatively skewed and can affect the centre of the distribution while kurtosis can affect the distribution's tails. The rule of thumb argues that skewness value that lies between (-1, 1) and (-2, 2) for kurtosis is an acceptable range for a normally distributed data set. From the table we observe that the data set indicates a normally distributed data set and there are no possible outliers in the study. The Jarque-Bera statistics alongside the revealed p-values confirms the normality of the data set. We observed that the p-values of JB statistics are all not significant (0.113761, 0.074083, 0.252416, and 0.141287) indicating a normal distribution of the data employed in the study.

Stationarity/ Unit Root Test

To avoid running a spurious regression, unit root test is carried out to ensure that the variables employed in this study are mean reverting i.e. stationary. To this end the Augmented Dickey Fuller (ADF) test is employed to establish the stationarity of the data. The result is presented in table 2

Table 2: Unit Root test

Variable	Augmented Dickey Fuller (ADF)		Order of Integration
	T-Statistics	**P-value**	
RGDP	-4.003609	0.0035	1(1) 1ST difference
DMD	-4.699981	0.0005	1(1) 1st difference
EXD	-4.863682	0.0003	1(1) 1st difference
RCEXP	-11.62989	0.0000	1(1) 1st difference
CEXP	-7.797534	0.0000	1(1) 1st difference
GN_I	-6.137392	0.0000	1(1) 1st difference

Source: Researcher's output from E-views 10

The result shown in table 2 reveals the individual stationarity of the variables. The ADF unit root test result can be interpreted using the t-statistic or the p-value. A variable is stationary if the ADF t-statistic in absolute term is greater than the ADF 5% critical value or the p-value is less than or equal to 0.05 level of significance. Table 2 indicates that all the variables (RGDP, DMD, EXD, and DS) are stationary at first difference. We

will therefore estimate the long run relationship subsisting among the variables using the Johansen Co-integration

Co-integration Test

Table 3: Johansen Co-integration Test (Model 1)

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.466924	59.00766	47.85613	0.0032
At most 1 *	0.385337	35.10221	29.79707	0.0111
At most 2 *	0.245539	16.60830	15.49471	0.0339
At most 3 *	0.143849	5.901729	3.841466	0.0151
Trace test indicates 4 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The presence of co-integration can is interpreted to mean the presence of a long-run equilibrium relationship between the variables in question that is the RGDP and domestic debt. Co-integration focuses on whether the long-term linear relationship between two or more time series is stationary even if this linear relationship does not exist or is not strong for the short term. Table 3 shows that variables in model 1 are co-integrated and thus have a long run relationship. The long run existence is confirmed by the p-value of the trace statistic all of which are less than 0.05. We therefore reject the null hypothesis where the trace or Max-Eigen statistic is higher than the 0.05 critical value. The null hypothesis of no co-integration is rejected and it is concluded that a long-run relationship exist among the variables.

Table 4: Table for Johansen Co-integration Test (Model 2)

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.470102	59.57657	47.85613	0.0027
At most 1 *	0.407741	35.44387	29.79707	0.0100
At most 2 *	0.262733	15.53904	15.49471	0.0492
At most 3 *	0.098880	3.956449	3.841466	0.0467
Trace test indicates 4 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 4 shows that variables in model 2 are co-integrated and thus have a long run relationship. The long run existence is confirmed by the p-value of the trace statistic all of which are less than 0.05. We therefore reject the null hypothesis where the trace or Max-Eigen statistic is higher than the 0.05 critical value. The null hypothesis of no co-integration is rejected and it is concluded that a long-run relationship exist between external debt and Real gross domestic product.

Table 5 Johansen Co-integration Test for Model 3

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.449681	57.29445	47.85613	0.0051
At most 1 *	0.354156	34.59866	29.79707	0.0130
At most 2 *	0.292333	17.98514	15.49471	0.0206
At most 3 *	0.119717	4.845452	3.841466	0.0277
Trace test indicates 4 co-integrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

Table 5 shows that variables in model 3 are co-integrated and thus have a long run relationship. The long run existence is confirmed by the p-value of the trace statistic all of which are less than 0.05. We therefore reject the null hypothesis where the trace or Max-Eigen statistic is higher than the 0.05 critical value. The null hypothesis of no co-integration is rejected and it is concluded that a long-run relationship exist among the variables in model 3.

Having established the long-run relationship subsisting among the variables in the three models, it is pertinent to estimate the Vector Error Correction Model of the models in the study. Estimating this model will enable us analyse the long-run equilibrium relationships among variables and short-run deviations from that equilibrium. Moreover the adjustment coefficients show us how the short-run deviations or disequilibrium are corrected.

Regression Estimates of Model Summary

Model 1: Testing for the effect of domestic debt on the economic growth of Nigeria

Table 6: Short Run Equation (Error Correction Result)

Variable	Coefficient	T-statistic	P-value
CointEq1	-0.071692	-1.07479	0.0344
D(logRGDP(-1))	0.431837	3.21732	0.0016
D(logDMD(-1))	-0.065205	-1.33352	0.1847
D(logCEXP(-1)	0.013065	0.54053	0.5897
D(logRCEXP(-1)	0.010524	0.59540	0.5526
C	0.013886	2.59061	0.0107
Source: Authors' Com			

Table 6 is the result of the short-run equation of model 1. We observe that the CointEq1 coefficient shows a negative position of -0.071692 at a p-value of 0.0344 which is rightly signed. We therefore state that the previous period's deviation from the long-run equilibrium is corrected in the current period at a speed of 7.1%. This indicates that there is a short-run relationship among the variables. Also for DMD coefficient, a unit change in DMD is associated with 0.065205 decrease in RGDP in the short run.

Table 7: Co-integrating Equation (Long-run Equation Model 1)

Variable	Coefficient	T-stat
LogRGDP (-1)	1.00000	
LogDMD (-1)	-0.170735	-3.23348
LogCEXP (-)	0.376137	10.8294
LogRCEXP (-1)	-0.001206	-0.02459
C	-4.174853	
R^2	0.347883	
Adj. R^2	0.249077	
F-stat	3.520879	
D.W	2.144598	

Source: Researcher's output from E-views

Table 7 show the Co-integrating equation result. In other words it indicate the long-run position of the relationship subsisting among the variables in the study. From the table it is observed that Log DMD reveals a negative long-run association with LogRGDP at (-0.170735) with a t-stat of 3.23348 significant at 5% level of significance. The durbin Watson (D.W) statistics of 2.14 indicates that there is no autocorrelation among the variables of interest under study. The control variables of LogCEXP and LogRCEXP indicate a positive and negative association respectively with only LogCEXP being significant. The null hypothesis is thus rejected and the alternative sustained. Therefore domestic debt has significant effect on Real Gross domestic Product in Nigeria. The Cointegrating equation is thus stated:

Model 2: Testing for the effect of External debt on the economic growth of Nigeria

Table 8: Short Run Equation (Error Correction Result)

Variable	Coefficient	T-statistic	P-value
CointEq1	-0.265487	-3.43300	0.0008
D(logRGDP(-1))	0.306971	2.32676	0.0215
D(logEXD(-1))	0.008011	0.55828	0.5776
D(logCEXP(-1)	0.046647	2.16930	0.0319
D(logRCEXP(-1)	-0.015275	0.01843	0.4086
C	0.0123212	3.40608	0.0009

Source: Researcher's output from E-views

Table 8 is the result of the short-run equation of model 2. It is observed that the CointEq1 coefficient is negatively signed with at a value of -0.265487 and p-value of 0.0008 which is rightly signed. We therefore state that the previous period's deviation from the long-run equilibrium is corrected in the current period at a speed of 26.5%. This indicates that there is a short-run relationship among the variables. For EXD coefficient, a unit change in EXD is associated with 0.008011 increases in RGDP in the short run.

Table 9 Co-integrating Equation (Long-run Equation Model 2)

Variable	Coefficient	T-stat
LogRGDP (-1)	1.00000	
LogEXD (-1)	0.028666	1.76884
LogCEXP (-)	0.296531	8.07291

LogRCEXP (-1)	-0.190649	-11.7931
C	-4.237718	
R^2	0.463457	
Adj. R^2	0.382152	
F-stat	5.700968	
D.W	2.175460	

Source: Researcher's Analysis from E-views

Table 9 show the Co-integrating equation result of model 2. In other words it indicates the long-run position of the relationship subsisting among the variables in the study. From the table it is observed that Log EXD reveals a positive long-run association with Log RGDP at (0.028666) with a t-stat of 1.76884 significant at 5% level of significance. The Durbin Watson (D.W) statistics of 2.2 indicates that there is no autocorrelation among the variables of interest under study. The control variables of Log CEXP and Log RCEXP indicate a positive and negative association respectively with only and significant. The null hypothesis is thus rejected and the alternative sustained. Therefore external debt has significant effect on Real Gross domestic Product in Nigeria. The Co-integrating equation is thus stated:

D(LOGRGDP) = C(1)*(LOGRGDP(-1) + 0.028666 + *LOGEXD(-1) -0.190649*LOGRCEXP(-1)+
LOGRCEXP(-1) + 0.296531LOGCEXP(-1) -4.237718 + C(2)* D(LOGRCEXP (-1) + C(3)*D(logexd (-1) + C(4)* D(LOGRCEXP(-1) + C(5)*D(LOGCEXP(-1)) + C(6)

Model 3: Testing for the effect of Debt Servicing on the Economic performance of Nigeria

Table 10: Short Run Equation (Error Correction Result)

Variable	Coefficient	T-statistic	P-value
CointEq1	-0.197222	-3.08245	0.00025
D(logRGDP(-1))	0.315758	2.35940	0.0198
D(logDS_GNI(-1))	0.001131	0.57567	0.5658
D(logCEXP(-1)	0.039501	1.81920	0.0711
D(logRCEXP(-1)	-0.007047	-0.40756	0.6843
C	0.012161	3.40091	0.0009

Table 10 is the result of the short-run equation of model 3. It is observed that the CointEq1 coefficient is negatively signed with at a value of -0.197222 and p-value of 0.00025 which is rightly signed. We therefore state that the previous period's deviation from the long-run equilibrium is corrected in the current period at a speed of 19.7%. This indicates that there is a short-run relationship among the variables. For DS coefficient, a unit change in DS_GNI is associated with 0.001131 increase in RGDP in the short run. Also a unit change in CEXP is associated with a unit increase in RGDP .While a unit change in RCEXP is associated with a unit decrease in RGDP.

Table 11 Co-integrating Equation (Long-run Equation Model 3)

Variable	Coefficient	T-stat
LogRGDP (-1)	1.00000	
LogDS_GNI(-1)	-0.001191	-0.18793
LogCEXP (-1)	0.346045	7.52841
LogRCEXP (-1)	-0.166388	-11.9944
C	-4.234451	

R^2	0.420337	
Adj. R^2	0.332509	
F-stat	4.785917	
D.W	2.159525	

Table 11 show the Co-integrating equation result of model 3. In other words it indicates the long-run association that exist among the variables of the study. From the table it is observed that Log DS_GNI reveals a negative long-run association with Log RGDP at (-0.001191) with a t-stat of -0.18793 significant at 5% level of significance. The durbin Watson (D.W) statistics of 2.15 indicates that there is no autocorrelation among the variables of interest under study. The control variables of Log CEXP and Log RCEXP indicate a positive and negative association respectively and significant. The null hypothesis is thus rejected and the alternative sustained. Therefore debt servicing has significant effect on Real Gross domestic Product in Nigeria. The Co-integrating equation is thus stated:

D(LOGRGDP) = C(1)*(LOGRGDP(-1) + 0.001191*DS_GNI(-1) + 0.346045*LOGCEXP(-1) - 0.166388*LOGRCEXP(-1) – 4.234451 + C(2)* D(LOGRGDP(-1) + C(3)*D(DS_GNI(-1) + C(4)* D(LOGCEXP(-1) + C(5)*D(LOGRCEXP(-1)) + C(6)

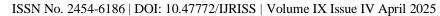## DISCUSSIONS AND POLICY IMPLICATIONS

Impact of domestic debt on Economic Growth.

The findings from the first hypothesis reveal that domestic debt exerts a negative and statistically significant impact on Nigeria's economic growth. The results further indicate the existence of both long-run and short-run relationships between domestic debt and economic growth, with short-run deviations being corrected in the current period at an adjustment speed of 7.1%. This suggests that while short-term shocks in domestic debt levels influence economic performance, the economy adjusts over time, albeit at a slow pace.

These findings align with the empirical evidence presented by Opara et al. (2021) and Ajayi and Edewusi (2021), who established that domestic debt and economic growth in Nigeria exhibit both long-term and short-term interactions. The negative impact observed reinforces concerns that excessive domestic borrowing tends to constrain economic expansion rather than stimulate it. This is consistent with the debt overhang theory, which posits that high debt levels discourage private investment due to the anticipated future tax burden needed for debt servicing (Krugman, 1988; Sachs, 1989). Hence the accumulation of large domestic debt creates expectations of future taxation or inflation, thereby discouraging private investment and consumption leading to macroeconomic instability. Moreover, the crowding-out effect suggests that increased government borrowing in domestic markets raises interest rates, thereby limiting credit accessibility for private sector investments, which are essential for economic growth (Elmendorf & Mankiw, 1999).

The findings underscore the necessity for prudent debt management strategies to mitigate the adverse effects of rising domestic debt. Specifically, excessive borrowing should be curtailed, and fiscal discipline should be strengthened to maintain a sustainable debt-to-GDP ratio. Furthermore, public debt should be strategically aligned with investments in productive sectors such as infrastructure, education, and healthcare—sectors with high multiplier effects that contribute to long-term economic growth. The misallocation of borrowed funds toward recurrent expenditures, which do not generate future economic returns, exacerbates fiscal vulnerabilities and must be minimized.

Policy implications of these findings suggest that the Nigerian government must adopt a comprehensive fiscal reform strategy aimed at reducing dependence on debt, enhancing public expenditure efficiency, and fostering economic diversification. Diversifying revenue sources beyond debt financing, particularly through enhanced tax revenue mobilization and non-oil sector growth, will contribute to a more resilient and sustainable economic framework with reduced debt-related risks.

Impact of External Debt on the Economic Growth

Conversely, the findings from the second hypothesis reveal that external debt exerts a positive and statistically less significant impact on economic growth in Nigeria. This suggests that foreign borrowing when effectively managed helps bridge savings-investment and foreign exchange gap. Thus contributing meaningfully to the country's economic performance, likely by financing capital-intensive projects that stimulate productivity and infrastructural development. However, this result contrasts with the findings of Iteh and Oyeanu (2021), who, using a Vector Autoregressive (VAR) model, reported a negative and significant relationship between external debt and economic growth. The discrepancy in findings could be attributed to differences in methodological approaches, time frames, and macroeconomic conditions under which the studies were conducted.

Furthermore, the results confirm the existence of both long-run and short-run relationships between external debt and economic growth, although the significance level is marginal at 10%, indicating that while external debt plays a role in economic expansion, its impact may not be as strong or immediate as other macroeconomic variables. The relationship between external debt and economic growth is complex but can be best understood in the light of certain theories such as Debt-Financed Growth Hypothesis which suggests that external debt, when effectively managed, enhances economic growth by bridging the savings-investment gap in developing countries. External borrowing helps to close these gaps as postulated in the dual gap theory which restricts growth by providing much-needed foreign exchange, enabling economies to invest in industrialization, technology, and human capital development, which, in turn, enhances GDP growth (Ajayi & Khan, 2022). While the current findings indicate that external debt positively contributes to economic growth, the debt overhang hypothesis (Krugman, 1988; Sachs, 1989) warns that excessive external debt can become a burden in the long run. If a country accumulates high levels of foreign debt without corresponding revenue growth, a significant portion of future national income is diverted toward debt servicing rather than productive investment. This weakens economic expansion and creates macroeconomic instability. Nigeria's growing debt-to-GDP ratio raises concerns that continued external borrowing, if not effectively managed, could lead to a future debt crisis (IMF, 2023) in place of a crowding in effect that compliment domestic investment.

The study's findings highlight the positive role of external debt in Nigeria's economic growth, in contrast to some previous empirical results that emphasized its detrimental effects. However, the long-term sustainability of external borrowing remains a critical concern. While foreign debt can stimulate growth in the short run, excessive reliance on borrowing without corresponding economic productivity could lead to fiscal instability. Therefore, prudent debt management, sector-focused investment, and effective fiscal governance are necessary to ensure that external debt continues to serve as a catalyst for sustainable economic development rather than becoming a liability.

Impact of Debt servicing on the Economic Growth

The findings from the third hypothesis reveal that debt servicing exerts a negative but statistically insignificant impact on economic growth in Nigeria. This result aligns with the findings of Chukwu (2023), who determined that debt servicing has no significant effect on Nigeria's economic performance and, as a result, cannot be used as a predictor of economic growth. While the present study confirms the existence of both long-run and short-run relationships between debt servicing and economic growth, the relationship remains weak and statistically insignificant. This suggests that although debt repayment might exert a mild adverse effect on economic performance, its immediate impact is not strong enough to be considered a primary determinant of economic growth.

When a significant portion of national revenue is diverted to servicing debt, government spending on critical growth-enhancing sectors such as infrastructure, education, and healthcare declines, thereby reducing long-term economic potential. However, the insignificance of debt servicing in this study suggests that Nigeria's debt repayment obligations may not yet have reached a critical level that impairs growth. The present findings indicate that Nigeria's debt servicing, while negative in effect, is not yet a severe constraint on economic performance, possibly due to flexible repayment terms or debt restructuring efforts that mitigate its impact.

CONCLUSIONS

Based on the analytical results carried out in the study, it is evident that public debt has effect on economic performance in different ways. The study specifically established that external debt impacts positively on economic performance of Nigeria both in the short runand long run while domestic debt possesses negative relationship with economic growth both in the long run and short run. Based on the findings of the study, we therefore conclude that public debt does impact economic performance depending on the form of debt contracted.
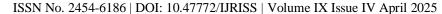
RECOMMENDATIONS

Based on the findings ascertained in the study, the following policy recommendations is imperative.

1. Policy makers should ensure that borrowing is aligned with productive investments or sector-specific investment that can generate economic returns in the long term such as infrastructure, education and healthcare rather than being used for recurrent expenditures. Integrate appropriate measures towards ensuring suitable management of domestic debts so as to enhance the productivity level of the country. Empirical evidence from Adegbite & Olayemi (2022) suggests that external debt, when allocated to these sectors, has a stronger positive impact on GDP growth.
2. Government should ensure that borrowings are tied to projects with clear revenue generating capabilities; while prioritizing investment in sectors with high growth potential and ensuring that external debt remains beneficial.
3. Government and policy makers must therefore reassess its debt sustainability framework to ensure that debt servicing does not become a future burden especially where debt is incurred continuously. Policymakers must adhere to debt sustainability thresholds set by the International Monetary Fund (IMF) and World Bank to prevent debt distress.

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