Effects of Total Public Debt Stock on Economic Growth in Nigeria: A Disaggregated Analysis

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Abstract

This study investigates the impact of public debt on economic growth in Nigeria, using the Debt Overhang Theory as a framework. The theory suggests that high debt levels can reduce growth by discouraging investment and causing fiscal strain. Quarterly data from 2007Q1 to 2024Q2 were sourced from the Debt Management Office (DMO), Central Bank of Nigeria (CBN), and National Bureau of Statistics (NBS). Real GDP (RGDP) was used to measure economic growth, while debt indicators included Multilateral Debt (MD), Bilateral Debt (BD), Commercial Debt (COMD), Banking Sector Debt (BSD), Non-Banking Sector Debt (NBD), and CBN Ways and Means Advances (CBNWM). Control variables were Exchange Rate (EXH), Inflation (INF), and Interest Rate (INT). An Augmented Dickey-Fuller (ADF) test confirmed all variables were stationary at first difference. Johansen cointegration test found five cointegrating relationships, indicating a stable long-term link. The long-run analysis of the vector error correction model (VECM) reveals that multilateral, bilateral, banking sector, non-banking sector debts, and Central Bank ways and means advances exert significant negative effects on economic growth, while exchange rate movements positively influence growth. The short-run results confirm a significant error correction mechanism, indicating gradual adjustment toward long-run equilibrium, with debt variables and inflation also playing notable roles in short-term GDP fluctuations. Also, Granger causality tests revealed predictive relationships between debt and growth variables, and confirmed the interconnectedness of Nigeria's debt system. The inverse roots of the AR polynomial confirmed model stability. The findings underscore the importance of prudent debt management and macroeconomic stability, suggesting that controlling inflation and exchange rate volatility alongside disciplined borrowing are essential for fostering sustainable economic growth. These insights provide valuable guidance for policymakers aiming to enhance economic performance through balanced fiscal and monetary strategies.

Keywords: Public Debt, Economic Growth, Multilateral Debt, Bilateral Debt Debt Overhang Theory

1.0 Introduction

The rising acquisition of public debt in Nigeria has become a matter of growing concern among policymakers, scholars, and international financial institutions. Public debt, categorized broadly into external and domestic debt, plays a critical role in bridging budget deficits and financing development projects, particularly in low and middle-income countries. In recent years, Nigeria has increasingly relied on various forms of external debt including multilateral, bilateral, and commercial sources as well as domestic debt instruments sourced from the banking sector, non-banking institutions, and advances from the Central Bank of Nigeria (CBN), particularly through its Ways and Means facility.

Public debt means the total financial obligations incurred by a government through borrowing from internal or external sources to finance public spending. While public debt, when efficiently managed, can catalyze economic growth by financing infrastructure, education, and health services, its mismanagement or excessive acquisition may impede long-term growth and macroeconomic stability. The empirical literature presents mixed findings on the relationship between debt and economic growth. For instance, Eze, and Ukwueni, (2023) found that external debt had an insignificant impact on Nigeria's economic growth. Additionally, Chinanuife, et'al (2018) discovered that multilateral debt negatively affected economic growth in Jordan, suggesting that the source of debt matters.

More recently, Nigeria's debt profile has expanded beyond conventional bilateral and multilateral loans to include market-based commercial debts and domestic borrowing from both banking and non-banking sectors. According to the Debt Management Office (DMO, 2025), Nigeria's total public debt stood at over ₦149trillion, with substantial proportions owed to multilateral agencies, bilateral partners, Eurobond holders, and the CBN. Despite the importance of understanding the differential impacts of these debt components, the existing literature predominantly examines the aggregate effects of total public debt, often neglecting the nuanced implications of each debt type.

The relationship between public debt and economic growth has long been debated in economic literature. According to Reinhart and Rogoff (2010), when public debt exceeds a certain threshold (often cited as 90% of GDP), it can begin to negatively impact economic growth. High levels of debt may crowd out private investment and increase interest rates, ultimately stalling economic expansion. Conversely, Barro (1979) argues that moderate public borrowing, particularly when used to finance productive investments, may promote growth, especially in developing countries facing capital constraints (Bamidele, Idris & Abubakar 2023). Multilateral debt involves loans from international organizations such as the International Monetary Fund (IMF) and the World Bank. These loans often come with lower interest rates and longer repayment terms. However, Ajayi and Khan (2000) caution that multilateral debt can become unsustainable if not well managed. Bilateral debt, on the other hand, is a loan agreement between two countries (Saleh, 2025). It is often influenced by political and strategic considerations (Iyoha, 1999). Commercial debt means loans from private sector creditors, such as commercial banks and bondholders. Although these loans are typically more expensive, they can be advantageous if used for high-yield projects (Elbadawi et al., 1997).

On the domestic side, the banking sector debt comprises loans and credit facilities extended to the government by commercial banks. Excessive reliance on this type of borrowing can crowd out private sector access to credit, thus inhibiting economic activity (Adam & Bevan, 2005). Non-banking sector debt, in contrast, includes borrowing from pension funds, insurance companies, and the general public through instruments such as treasury bills. Though considered less distortive, it still imposes a future fiscal burden if not managed prudently (Checherita-Westphal & Rother, 2012). The Central Bank of Nigeria (CBN) provides temporary financing to the federal government through "Ways and Means Advances." While this mechanism is intended to cover short-term budget gaps, overdependence can lead to inflation and fiscal indiscipline. According to the CBN Act (2007), such advances should be limited to 5% of the previous year's revenue. However, exceeding this threshold, as observed in recent years, may have inflationary effects and erode monetary policy effectiveness (Nguyen, 2022). Debt Overhang Theory popularized by Krugman (1988) argues that when a country's debt level is perceived as unsustainable, potential

investors may fear future tax increases or macroeconomic instability. This reduces incentives to invest and thereby hampers economic growth. The theory implies that debt restructuring or relief may be necessary to restore growth in heavily indebted countries.

The fundamental problem confronting Nigeria today is the persistent increase in public debt without a corresponding and sustainable improvement in economic growth indicators. Although successive governments have justified borrowing on the grounds of infrastructure and development financing, the country's GDP growth remains relatively weak, inflation remains high, and debt servicing obligations continue to consume a substantial portion of government revenue (CBN, 2023). This raises questions about the effectiveness of different categories of debt in promoting economic development. Much of the existing empirical research tends to focus on either total public debt or external debt in general, without disaggregating the data to analyze the effects of multilateral, bilateral, commercial, and domestic debt by source. For instance, studies by Nzeh (2019) and Didia and Ayokunle (2020) provide important insights into the broader debt-growth relationship but fall short of distinguishing the impact of specific debt sources such as CBN Ways and Means advances or banking versus non-banking sector debt. Similarly, while Chenaa, & Aziseh (2024). explored commercial borrowing trends, their analysis lacked country-specific evidence for Nigeria.

This gap in the literature is particularly concerning given Nigeria's increasing reliance on diverse forms of borrowing, each carrying different costs, risks, and repayment structures. The dearth of empirical studies examining the distinct effects of these debt sources leaves policymakers with insufficient information to make informed borrowing decisions. Therefore, there is a pressing need for a comprehensive study that disaggregates Nigeria’s debt profile and empirically examines the individual and collective impact of multilateral, bilateral, commercial, banking sector, non-banking sector, and CBN Ways and Means debts on economic growth. This study seeks to fill that gap by providing nuanced, evidence-based insights into how each form of debt influences Nigeria’s economic performance.

2.0 Literature Review

2.1 Empirical Literature

Understanding how public debt affects economic growth has been a major topic of discussion, especially in developing countries like Nigeria. Many studies have looked into this issue, but their findings often differ depending on the country, time period, research methods, and types of debt studied. While earlier research mainly looked at the overall impact of public debt, recent studies such as Nwala & Saleh (2021) now focus on breaking debt down into types such as multilateral, bilateral, commercial, and domestic to see how each type of debt affects the economy differently. More specifically, Saleh (2025) looked at the effect of multilateral debt on growth and concluded that deficit financing through multilateral debt enhances economic growth but its effectiveness depends on effective governance and transparency in the utilization of borrowed funds. This section provides a review of past studies on how different kinds of public debt affect economic growth, with attention to both global and Nigerian experiences.

Public debt and its implications for economic growth have attracted wide attention among scholars. In the Nigerian context, Edward and Amadi (2024) investigated how public debt influenced Nigeria’s economic development between 1990 and 2021. Their study considered different categories of debt, including treasury bills, treasury bonds, multilateral loans, and bilateral loans,

with the Human Development Index (HDI) serving as the indicator of economic performance. Data were obtained from the Central Bank of Nigeria's statistical bulletin and the World Bank, and analyzed using several statistical techniques. The findings revealed that treasury bills, treasury bonds, and bilateral debt positively contributed to HDI in both the short and long term, whereas multilateral debt had an adverse effect. The researchers recommended enacting strict legislation to curb the embezzlement of public funds and ensuring that offenders face appropriate penalties.

Ajayi and Edewusi (2020) employed a Vector Error Correction Model (VECM) covering 1982–2018 and reported that foreign debt exerted negative effects on growth in both the long and short run. However, their study did not include data for 2019 despite its availability, and it overlooked effective domestic debt management strategies. Similarly, Duro, Tega, Sola, and Olanrewaju (2020) utilized multiple regression and correlation tests and found that International Monetary Fund (IMF) loans had a positive effect on Nigeria's GDP. Yet, their reliance solely on IMF loans as an indicator of external debt reduced robustness, as broader co-integration techniques like VECM would have offered deeper insights. Along this line, Paul (2017), applying an Error Correction Technique (ECT) for 1985–2015, showed that foreign debt stock positively impacted growth. Nonetheless, his policy recommendations were misguided since they failed to recognize the developmental uses of loans stipulated in the Fiscal Responsibility Act of 2007.

Further empirical evidence within Nigeria highlights debt composition as a key determinant. Ohiamu (2020) using ARDL bounds testing, showed that debt overhang and crowding-out effects constrained growth, but his recommendations for debt reduction were too generic and lacked implementable strategies. Chinaemerem and Anayochukwu (2013) disaggregated foreign debt and discovered that London Club loans positively contributed to development, whereas Paris Club loans were harmful. Their work, however, was limited by outdated instruments already repaid before 2011. In another update, Chinaemerem and Anayochukwu (2019) employed VECM and found that commercial debts such as promissory notes negatively affected growth, recommending debt service cancellation and SME support. While insightful, their repeated calls for debt cancellation after Nigeria's Paris Club debt relief made the recommendations obsolete.

In contrast, cross-country and regional studies have presented more nuanced findings. Alfred (2020), analyzing Tanzania, established that short-term debt had significant positive effects while long-term debt remained insignificant. The study, however, failed to situate its findings in a regional comparative context. Likewise, Mothibi (2019) employed ARDL for South Africa and revealed that unsustainable debt levels constrained growth. Yet, the study's focus on domestic debt conflicted with its title and left gaps regarding external debt. At the continental level, Gachungal and Kuso (2018) applied GMM across 38 Sub-Saharan African countries and found external debt to negatively affect growth, with commercial debts posing particular risks for middle-income economies. However, their recommendations were overly broad and lacked country-specific strategies.

Evidence from other developing economies also supports the mixed debt–growth relationship. Evidence from Jordan by Fseifes et al. (2020), for example, showed multilateral debt exerted negative effects on growth, underscoring the importance of debt source. Similarly, Tuncer (2019) assessed Turkey (1970–2016) and found external debt to promote growth, while openness and inflation dampened performance. Farooq, Khan, and Akram (2017), analyzing Pakistan between 1976 and 2015 with ARDL, found that bilateral debt was harmful to growth, whereas Paris Club and multilateral debts were beneficial. Yet, their reliance on outdated data reduced present policy

relevance. Hasan (2015) also discovered a negative debt–growth link in Turkey, though contextual differences limited transferability of findings to Nigeria.

Country-specific experiences in Europe further enrich this discourse. Silva (2020) analyzed Portugal (1999–2019) and established that foreign loans positively and significantly impacted growth, though the study overlooked debt disaggregation. A related work by Silva (2018) differentiated between private and public debt, showing that private debt was beneficial while public debt had adverse effects on GDP and productivity. Despite these insights, both studies missed more recent data that could have improved robustness.

Turning back to Nigeria, several studies have focused on the dynamics of domestic versus external borrowing. Gimba et al. (2024) examined the impact of Nigeria's foreign loan stock—measured through bilateral and multilateral debts—on the inflation rate between 2008 and 2023. The study utilized quarterly data sourced from the 2023 Debt Management Office reports and the CBN Statistical Bulletin. Using multiple regression analysis, the findings indicated that bilateral debt had a significant negative effect on inflation. Based on this, the researchers advised the Federal Government to expand bilateral borrowing for capital project financing. However, they cautioned that not all bilateral loans are concessional, even though such loans were recommended for infrastructure development.

Inyang and Effiong (2020) applied ARDL and ECM to 1981–2019 data and found a long-run relationship where debt burden, though positive, was insignificant. Their failure to disaggregate components, however, limits insight into which types of debt are more sustainable. Ujuju and Oboro (2017) demonstrated that external debt negatively affected GDP while domestic debt was positive, recommending increased reliance on the latter. Similarly, Idowu et al. (2017), using SVAR, confirmed that domestic borrowing constrained macroeconomic growth. Earlier, Mbah, Umunna, and Agu (2016) reported a negative effect of foreign loans on output, though their outdated data excluded post-debt relief dynamics. Likewise, Nwannebuike (2016) showed that foreign loans had negative long-run and positive short-run effects, but misdirected recommendations regarding the Debt Management Office's role weakened the policy implications.

Other studies in Nigeria have examined sectoral dimensions. Omodero et al. (2021) focused on household debt and found a positive effect on growth, stressing the need to observe debt thresholds. On their part, Odubuasi, Uzoka, and Anichebe (2018) argued that foreign loans positively influenced growth when channeled into capital expenditure, though this contradicted the Fiscal Responsibility Act's prioritization of human development. Similarly, Eze and Ogiji (2016) highlighted that both banking debt and interest rates negatively impacted growth, while non-banking debt and external loans promoted stability. Nwaeke and Korgbeelo (2016) and Nwala and Saleh (2021) using OLS, echoed these findings by showing that domestic and non-banking debt enhanced output. However, both works excluded more recent years of data, which diminishes their current relevance.

From a methodological perspective, diverse approaches have been adopted across contexts. Zaheer, Khaliq, and Rafiq (2019) using VAR, revealed that higher public borrowing in Pakistan crowded out private credit within months, but their failure to disaggregate debt sources limited understanding of transmission mechanisms. Wani and Kabir (2016), in Afghanistan, and Mun and Ismail (2015), in Malaysia, both underscored the negative effects of external or internal debt during specific crises, though their short study periods restricted generalization. Likewise, Amassoma

(2011) in Nigeria identified bi-directional causality between internal debt and growth, stressing the feedback relationship, while Onyeiwu (2012) revealed that excessive internal debt crowds out investment by surpassing 35% of bank deposits.

Broader global perspectives provide theoretical underpinnings. Shilling (2021), in a theoretical global study, argued that banking debt during recessions intensifies contractions but noted that GDP can rebound quickly in both high- and low-debt countries. Likewise, Maithreerathna et al. (2019) found that Sri Lanka's domestic debt negatively impacted GDP, suggesting public-private partnerships (PPPs) and foreign direct investment (FDI) as alternatives. Broccolini et al. (2019) showed that Multilateral Development Banks (MDBs) through syndicated lending increased deal sizes and capital inflows in developing countries, though their work did not extend to long-run growth implications.

Thus, empirical evidence presents a complex and sometimes contradictory picture. While some studies suggest that debt particularly external can promote growth when well-managed, others emphasize its potential to crowd out private investment, generate overhang effects, or undermine macroeconomic stability. The diversity of methodologies, data coverage, and contexts contributes to these mixed findings, underscoring the importance of considering debt composition, country-specific institutions, and time period in understanding the debt–growth nexus.

2.2 Theoretical Framework

This paper relied on the Debt Overhang Theory as a framework. The Debt Overhang Theory, advanced by Krugman (1988), posits that when a nation's debt exceeds its repayment capacity, the anticipation of higher future taxes deters private investment, which in turn slows economic growth. In such situations, debt acts as a constraint on growth unless it is properly managed and channeled into productive ventures. In more simple term, debt overhang theory suggests that when a country's debt is too high it can reduce growth by discouraging investment and causing fiscal strain. That is to say potential investors expect that much of the returns from new investments will be used to service existing debt rather than benefit the economy. As a result, high debt discourages both domestic and foreign investment, reduces economic growth, and can trap countries in a cycle of borrowing and underdevelopment.

3.0 Methodology

The research adapts the study of Iyoha (1999) who employed a linear regression model to analyze the relationship between **external debt** and **economic growth**, with real GDP as the dependent variable and various components of debt (total debt stock and debt service) and control variables (interest rate, inflation, terms of trade) as independent variables. Iyoha (1999) model is structured as: $RGDP_t = \beta_0 + \beta_1 DebtStockt + \beta_2 DebtService_t + \beta_3 TOT_t + \beta_4 IR_t + \varepsilon_t$ ……..*3.1*

This current study **adapts and improves** Iyoha's model by **Disaggregating external debt** into specific categories like multilateral debt, bilateral debt, commercial bank debt, banking sector debt, non-banking sector debt, and CBN Ways and Means Advances. This study also **replaced Iyoha's term of trade and debt service with** inflation rate, and exchange rate but retained interest rate as **macroeconomic control variables**, lastly **to critically explore the dynamic effect of the variables of study, this study hired VECM** model so as to accommodates short-run and long-run relationships which improves upon the static linear regression used in Iyoha (1999).

Thus, the functional form of the upgraded model is specified as:

$RGDP_t = F(MDt, BDt, COMDt, BSDt, NBDt, CBNWMt, INTt, INFt, EXHt)$ ……..3.2

Econometric model as

$RGDP_t = \beta_0 + \beta_1 MD_t + \beta_2 BD_t + \beta_3 COMD_t + \beta_4 BSD_t + \beta_5 NBD_t + \beta_6 CBNWM_t + \beta_7 INT_t + \beta_8 INF_t + \beta_9 EXH_t + \mu_t$ ……3.3

Where:

Dependent Variable: RGDP = Real Gross Domestic Product (to proxy growth)

Independent Variables: MD = Multilateral Debt BD = Bilateral Debt

COMD = Commercial Bank Debt BSD = Banking Sector Debt

NBD = Non-Banking Sector Debt CBNWM = Central Bank (CBN) Ways and Means Advances

Control Variables: INT = Interest Rate INF = Inflation Rate EXH = Exchange Rate

Since the variables are I(1) and co-integrated, a **Vector Error Correction Model (VECM)** is used to capture both short-run dynamics and long-run equilibrium. Thus, the study there by present the vector error correction model as:

$$\Delta RGDPt = \alpha 0 + \sum_{i=1}^{n} \alpha 1i \Delta MDt - i + \sum_{i=1}^{n} \alpha 2i \Delta BDt - i + \sum_{i=1}^{n} \alpha 3 \Delta COMDt - i + \sum_{i=1}^{n} \alpha 4 \Delta BSDt - i + \sum_{i=1}^{n} \alpha 5 \Delta NBDt - i + \sum_{i=1}^{n} \alpha 6 \Delta CBNWMt - i + \sum_{i=1}^{n} \alpha 7 \Delta INTt - i + \sum_{i=1}^{n} \alpha 8 \Delta INFt - i + \sum_{i=1}^{n} \alpha 3 \Delta EXHt - i + \lambda ECMt - 1 + \varepsilon t$$

Where:
Δ = first difference operator
ECM_{t-1} = error correction term obtained from long-run co-integration equation
λ = speed of adjustment parameter (must be negative and significant)
ε_t = error term
The coefficient of the ECM (λ) must be negative and statistically significant to confirm the existence of a long-run equilibrium relationship.

Granger Causality Test

To see the direction of causality the study presented the causality test, Let Y_t and X_t be two stationary time series. A variable X Granger-causes Y if past values of X help predict current

values of Y, **beyond** what past values of Y can explain. For testing whether X Granger-causes Y

$$Y_t = \alpha_0 + \sum_{i=1}^{p} \alpha i Y_{t-I} + \sum_{j=1}^{p} \beta_j X_{t-1} + \epsilon_t$$

Null Hypothesis H_0: $\beta_1 = \beta_2 = \ldots = \beta_p = 0$ (i.e., X does **not** Granger cause Y) and Alternative Hypothesis H_1: At least one $\beta_j \neq 0$ An F-test is used to assess whether the lagged values of X significantly improve the prediction of Y. If the null is rejected, we say that X **Granger-causes** Y.

4.0 Results and Analysis

This study uses the Augmented Dickey-Fuller (ADF) test to check if the data on public debt and economic growth in Nigeria are stable over time. The results show that all variables are non-stationary at their original levels, meaning they contain unit roots and could produce misleading results if not properly adjusted.

Table 4.1 Unit Root Test

LEVEL				**FIRST DIFFERENCE**			
Variables	ADF Test Statistic	Critical Value @ 5%	Prob.	ADF Test Statistic	Critical Value @ 5%	Prob.	Order of Integration
Log(RGDP)	-0.332147	-2.904198	0.7408	-7.096856	-2.904848	0.0000	1(1)
Log(BSD)	-0.738020	-2.918778	0.8277	-2.991480	-2.918778	0.0423	1(I)
Log(NBD)	-1.073423	-2.916566	0.7199	-10.99489	-2.916566	0.0000	1(I)
Log(CBWM)	-0.344445	-2.918778	0.9106	-6.279514	-2.918778	0.0000	1(I)
Log(MD)	1.539439	-2.917650	0.9992	-5.951882	-2.917650	0.0000	1(I)
Log(BD)	0.436273	-2.915522	0.9828	-8.889487	-2.916566	0.0000	1(I)
Log(COMD)	-0.931421	-2.915522	0.7708	-9.413227	-2.916566	0.0000	1(I)

Source : Author's computation using E-view 9

Thus, the order of integration for all explanatory variables is I(1), while the dependent variable Log(RGDP) is also effectively I(1) in this dataset. This condition supports the use of the Vector Error Correction Model (VECM), as it is appropriate for handling variables that are non-stationary at level but stationary at first difference and potentially co-integrated. To confirm the long run features of the data set, the study further conducted Johansen co-integration test and the results is presented in table 4.2 below.

Table 4.2 Johansen Co-integration Result

Test	Statistic	5% Critical Value	Inference
Trace (At most 4 cointegrating eqns)	98.645	95.754	Cointegration exists
Max-Eigenvalue (At most 4)	41.921	40.078	Cointegration exists
Number of Cointegrating Equations	**5**	—	Long-run relationship confirmed
Long-run Relationships with RGDP			
Variable	**Effect on RGDP**	**Direction**	
MD	-0.0022	Negative	
BD	-0.0065	Negative	
COMD	+0.0012	Slight Positive	
BSD	-0.9274	Strong Negative	
NBD	-0.4122	Negative	
CBNWM	-1.7818	Strong Negative	
EXH	+79.4029	Strong Positive	

Source : Author's computation using E-view 9

The Johansen cointegration test shows a strong long-term relationship between Nigeria's GDP and various types of public debt, along with control variables like exchange rate, inflation, and interest rate. Central Bank Ways and Means Advances (CBNWM) and Banking Sector Debt (BSD) have significant negative impacts on GDP, while the exchange rate has a strong positive effect. Other debt types show weaker impacts. The study also used VAR lag order selection to identify the best lag length for the model, using criteria like AIC and SC for accuracy and model simplicity.

Table 4.4 VAR Lag Order Selection Criteria

Endogenous variables: RGDP						
Exogenous variables: C MD BD COMD BSD NBD CBNWM EXH INF INT						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-508.1986	NA	818786.2	16.45075	16.79093	16.58454
1	-455.6913	86.67863	159745.2	14.81560	15.18980*	14.96277*

2	-455.5334	0.255668	164253.0	14.84233	15.25055	15.00288
3	-455.5033	0.047831	169609.6	14.87312	15.31535	15.04705
4	-455.3895	0.176912	174716.3	14.90126	15.37751	15.08857
5	-451.3165	6.206498*	158758.5*	14.80370*	15.31397	15.00439
6	-450.3323	1.468555	159163.3	14.80420	15.34849	15.01827
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error				SC: Schwarz information criterion		
AIC: Akaike information criterion				HQ: Hannan-Quinn information criterion		

Source : Author's computation using E-view 9

The FPE, AIC, and LR test all point to lag 5 as the best choice for model accuracy and prediction, while HQ and SC being stricter on complexity suggest lag 1. Overall, lag 5 offers the best fit, but lag 1 could be used for a simpler model, especially when working with limited data.

VECM Long-Run Estimates (Cointegrating Equation)

The Vector Error Correction Model (VECM) long-run estimates provide valuable insights into the equilibrium relationship between Real Gross Domestic Product (RGDP) and several forms of debt and macroeconomic control variables in Nigeria. The model confirms that a long-term relationship exists among these variables, with all coefficients statistically significant at conventional levels. The negative coefficients for most types of debt suggest a contractionary influence on economic growth, while the macroeconomic control variables reinforce the importance of sound economic management.

Table 4.5 Long Run Estimate

Variable	Coefficient	Std. Error	t-Statistic	Significance
RGDP(-1)	1.000000	-	-	Reference
MD(-1)	-0.002193	0.00056	-3.94677	Significant
BD(-1)	-0.006462	0.00240	-2.69578	Significant
COMD(-1)	0.001151	0.00026	4.44805	Significant
BSD(-1)	-0.927443	0.16338	-5.67656	Significant
NBD(-1)	-0.412167	0.16485	-2.50024	Significant

CBNWM(-1)	-1.781757	0.40277	-4.42378	Significant
EXH(-1)	79.40285	6.79714	11.6818	Significant
INF(-1)	-173.4390	38.6814	-4.48378	Significant
INT(-1)	-173.8574	56.1005	-3.09904	Significant
Constant	-15746.42	-	-	-

Source : Author's computation using E-view 9

Multilateral debt (MD) is found to have a statistically significant negative effect on RGDP in the long run, with a coefficient of -0.002193. This suggests that increased borrowing from multilateral institutions is associated with a decline in real economic output. This finding is consistent with the debt overhang hypothesis as emphasized in empirical studies such as Iyoha (1999) and Pattillo et al. (2002), who argue that high levels of external debt can discourage investment and hinder economic growth, especially when the borrowed funds are not channeled into productive sectors. However, the finding contradicts the conclusion of Saleh (2025) who discovered a significant positive impact of multilateral loans on RGDP.

Consistent with the recent findings of Saleh (2025), bilateral debt (BD) exerts a negative long-term impact on RGDP, with a coefficient of -0.006462. This result supports earlier studies by Ajayi (1991) and Elbadawi et al. (1997), which indicate that bilateral loans, often tied to political and concessional conditions, can become unsustainable and reduce fiscal space for growth-enhancing expenditures. The relatively larger magnitude compared to multilateral debt suggests that bilateral debts may pose even greater risks to growth when poorly managed.

In contrast, external commercial bank debt (COMD) shows a positive and significant relationship with RGDP, with a coefficient of 0.001151. This implies that debt sourced from commercial banks may contribute positively to economic performance, possibly due to its use in more targeted and productive ventures. This aligns with findings from Clements et al. (2003), who argue that certain types of external debt, particularly those linked to infrastructure or trade, can enhance growth if efficiently utilized and well-managed. This result contradicts the findings of Saleh (2025) who showed a significant negative impact of commercial external loans on debt service.

So also, Banking sector debt (BSD) has a large negative coefficient of -0.927443, suggesting that domestic debt owed to the banking sector severely hampers growth in the long run. This finding contradicts optimistic views in works like Elbadawi et al. (1997), which emphasize the positive role of the financial sector in economic development.

Non-banking sector debt (NBD) also reveals a negative relationship with RGDP, with a coefficient of -0.412167. This reinforces the notion that debt acquisition in the domestic economy, if not associated with productive activities, could depress growth. This is in line with findings by Reinhart and Rogoff (2010), who warned that exceeding certain debt thresholds could harm long-term output irrespective of the source. One of the most striking results in the model is the highly negative coefficient on Central Bank Ways and Means Advances (CBNWM), valued at -1.781757. This suggests that overreliance on central bank financing of fiscal deficits has a deeply damaging effect on growth in the long run. This finding supports studies such as Nguyen, et al. (2022) and

recent IMF (2022) reports, which criticize the monetization of deficits in Nigeria for fueling inflation and eroding investor confidence.

The exchange rate (EXH) carries a positive and significant coefficient of 79.40285, indicating that currency depreciation may be associated with higher real GDP. While this result may seem counterintuitive, it could suggest that exchange rate depreciation improves export competitiveness, stimulating domestic production. This aligns with Maithreerathna et al. (2019) who observed a similar effect under an export-led growth framework. However, caution is warranted given Nigeria's heavy dependence on imports and vulnerability to external shocks. Inflation (INF) and interest rate (INT) both have large negative coefficients, -173.4390 and -173.8574 respectively, and are statistically significant. These findings underscore the adverse impact of macroeconomic instability on growth. High inflation erodes purchasing power and increases uncertainty, while elevated interest rates can crowd out private investment. These outcomes are consistent with Barro (1995), who found that macroeconomic volatility and financial repression undermine long-run economic performance.

Short-Run Estimates

The short-run estimates derived from the Vector Error Correction Model (VECM) capture how deviations from long-term equilibrium are corrected over time. Central to this dynamic adjustment is the Error Correction Term (ECT), which has a coefficient of -0.0752 and is highly statistically significant at the 1% level. This negative and significant ECT confirms the existence of a stable long-run relationship between real GDP and the repressors. It also suggests that approximately 7.5% of any deviation from long-run equilibrium is corrected in the subsequent period. This moderate speed of adjustment indicates that shocks to economic growth are gradually but meaningfully realigned with long-term fundamentals, echoing empirical results from Engle and Granger (1987) and similar country-level studies like Adegbite and Ayadi (2010), which found consistent error correction dynamics in macroeconomic variables in Nigeria.

Table 4.6 Short-run Estimates

Regressor	Coefficient	Std. Error	t-Statistic	Significance
ECT (CointEq1)	-0.0752	0.0187	-4.02	*** (1%)
Δ(RGDP(-1))	0.0521	0.0240	2.17	* (10%)
Δ(MD(-1))	0.1023	0.0343	2.98	** (5%)
Δ(BD(-1))	0.0715	0.0274	2.61	** (5%)
Δ(INF(-1))	-0.0034	0.0013	-2.55	** (5%)
Δ(EXH(-1))	0.0049	0.0016	3.02	** (5%)
Δ(CBNWM(-1))	-0.0932	0.0334	-2.79	** (5%)
Constant	125.47	51.28	2.45	** (5%)

Source : Author's computation using E-view 9

The lagged change in RGDP (ΔRGDP(-1)) has a positive and significant coefficient of 0.0521 at the 10% level, indicating some inertia or momentum in GDP growth. This suggests that past improvements in growth influence current economic performance, consistent with empirical findings by Adegbite and Ayadi (2010), which recognized persistence in Nigeria's output fluctuations. The short-run effect of multilateral debt (ΔMD(-1)) is positive and significant at the 5% level, with a coefficient of 0.1023. Unlike its long-run counterpart, this result suggests that in the short term, disbursements from multilateral creditors may stimulate economic activities, perhaps through budget support, infrastructure financing, or project implementation. This aligns with Clements et al. (2003) who argued that well-utilized debt can have a short-term expansionary effect, especially when accompanied by proper fiscal oversight. Similarly, bilateral debt (ΔBD(-1)) shows a positive and significant coefficient of 0.0715, reinforcing the notion that bilateral aid or loans may serve as a short-term fiscal stimulus. This outcome agrees with the findings of Todaro and Smith (2011), who noted that concessional bilateral loans, particularly for social sector investments, can have immediate positive effects even if long-term consequences differ.

Inflation (ΔINF(-1)) exerts a statistically significant negative impact on RGDP in the short term, with a coefficient of -0.0034. This result is consistent with conventional macroeconomic theory and past empirical research such as Barro (1995), which indicates that inflationary pressures reduce purchasing power, create uncertainty, and adversely affect output levels. This finding underscores the importance of price stability in promoting short-run economic growth. Exchange rate changes (ΔEXH(-1)) are positively and significantly related to RGDP in the short run, with a coefficient of 0.0049. This suggests that a depreciation of the naira, in the immediate term, may boost real output through improved export competitiveness and reduced import demand.

The coefficient of ΔCBNWM(-1) (Ways and Means Advances by the Central Bank) is significantly negative at -0.0932, reaffirming the harmful short-term effects of excessive monetary financing of government deficits. This supports recent findings by the International Monetary Fund (IMF, 2022) and Akpan et al. (2021), which criticize the rising use of central bank overdrafts for fiscal operations in Nigeria as inflationary and crowding out private investment, thereby depressing output even in the short run. Finally, the constant term is positive and significant, suggesting that other omitted or autonomous factors are contributing positively to short-run fluctuations in real GDP.

The short-run estimates reveal important dynamics in Nigeria's growth trajectory. While certain debt components (like multilateral and bilateral debt) stimulate growth in the immediate term, others such as inflation and central bank overdrafts have adverse effects. The significant and appropriately signed ECT provides strong evidence of a gradual but effective correction toward long-run equilibrium. These results underscore the need for careful debt composition, inflation targeting, and sound monetary-fiscal coordination in the short-run stabilization policy framework. The long-run cointegration equation confirms that there exists a stable long-run relationship between RGDP and the explanatory variables, as indicated by the significant and negative error correction term in the RGDP equation. This means the Nigerian economy adjusts towards long-run equilibrium after short-run shocks.

The Granger causality test results reveal several significant causal relationships at the 5% significance level. Most notably, Banking Sector Debt (BSD) Granger causes RGDP, suggesting that increases in banking sector debt may have predictive power over real GDP movements in Nigeria. Conversely, RGDP Granger causes Central Bank Ways and Means (CBNWM), implying

a feedback mechanism from economic performance to CBN borrowing behavior. There is substantial bidirectional causality among various types of debt, especially between Multilateral Debt (MD) and its bilateral, commercial, and banking components, signifying a complex interdependence. Additionally, Exchange Rate (EXH) and Inflation (INF) show mutual Granger causality, reflecting the feedback loop often present in macroeconomic variables. The causality from INT (interest rate) and INF (inflation) to debt variables also indicates the macroeconomic sensitivity of public debt channels. Overall, the results emphasize the dynamic and interrelated nature of debt composition and macroeconomic outcomes in Nigeria.

Post Estimation Diagnostic Tests

The post-estimation diagnostic tests for the VECM provide a mixed but largely favorable assessment of model adequacy. The serial correlation test at lag 3 indicates no significant autocorrelation ($p = 0.1486$), suggesting that the model effectively captures short-run dynamics and that residuals behave like white noise at this lag. However, the normality tests reveal significant departures from multivariate normality in many components, primarily due to skewness and kurtosis, as confirmed by the Jarque-Bera and joint tests. This suggests caution when relying on inference methods that assume normal residuals. In contrast, the heteroskedasticity test results are encouraging, with the joint chi-square test ($p = 0.4297$) showing no strong evidence of heteroskedasticity, despite a few individual components indicating localized variance issues. Overall, the model appears robust in terms of serial correlation and variance stability, but the non-normality of residuals may warrant the use of robust inference techniques or model adjustments.

5.0 Conclusion and Recommendation

Based on the VECM long-run and short-run results, it is evident that various forms of debt multilateral, bilateral, banking sector, non-banking sector, and central bank advances have significant long-term negative impacts on real GDP, while factors like exchange rate show a strong positive influence on economic growth. In the short run, the error correction term confirms a moderate but significant adjustment toward long-run equilibrium, with some debts and macroeconomic variables also influencing short-term growth fluctuations. These findings suggest that excessive reliance on certain debt types may hinder sustainable growth, while maintaining stable exchange rates and controlling inflation are crucial for economic stability. Therefore, policymakers should prioritize prudent debt management by limiting unproductive borrowing and enhancing fiscal discipline, alongside implementing policies that stabilize inflation and exchange rates to support both short-term recovery and long-term economic growth.

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