Impact of Multilateral Debt Stock on Economic Growth in Nigeria: Evidence from a Vector Error Correction Techniques

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ABSTRACT

This study investigates the impact of multilateral debt on economic growth in Nigeria within the theoretical framework of Public Choice Theory, which emphasizes the role of institutional behaviour and fiscal decision-making in economic outcomes. Using quarterly data from 2007Q1 to 2024Q2, the study employs real gross domestic product (RGDP) as a proxy for economic growth, while multilateral debt (MUD), inflation rate (INF), exchange rate (EXH), and debt servicing (DBS) serve as the independent variables. Data were sourced from the Central Bank of Nigeria (CBN), the Debt Management Office (DMO), and the Budget Monitoring Office (BMO). To assess the time-series properties of the variables, the Augmented Dickey-Fuller (ADF) test was conducted, confirming that all variables are integrated in order one, I(1). The Johansen Cointegration Test reveals the existence of long-run relationships among the variables. The Vector Error Correction Techniques (VECM) confirmed the presence of a significant short-run adjustment mechanism. Furthermore, the Wald Short-Run Causality Test and the Toda-Yamamoto Causality Test provide evidence of unidirectional causality from multilateral debt, debt servicing, and exchange rate to real GDP. These results suggest that while multilateral debt can promote economic growth, its effectiveness largely depends on proper fiscal governance, transparency, and productive utilization of borrowed funds. The study recommends prudent debt management policies and structural reforms to optimize the growth-enhancing potential of multilateral borrowing in Nigeria.

Keywords: Multilateral Debt, Debt Servicing, Economic Growth, Public Choice Theory, Toda-Yamamoto

INTRODUCTION

Most countries borrow money when their revenues cannot cover expenses. Some borrow not only to fund spending but also to restructure or refinance existing debt. These borrowings can come from both domestic and international sources (Nwoye et al., 2023; Ikwuo et al., 2024). The total amount of these borrowings is called public debt stock. Public debt helps countries finance budget deficits and fund infrastructure and other development projects to improve living standards and promote economic growth (Eke & Akujuobi, 2021). Obudah and Tombofa (2013) note that countries borrow to cover budget shortfalls, manage debt efficiently, and deepen financial markets, aiming for sustainable growth. This borrowing is especially common in developing and underdeveloped countries, which typically have low domestic investment and savings. As a result, they rely on foreign loans to bridge the gap (Ekpe, 2020).

However, too much borrowing, especially from foreign sources, can be harmful. It can increase a country's debt burden due to exchange rate fluctuations and may lead to a situation where repayment becomes impossible—known as a debt overhang. This can hurt stock markets, limit investment, and reduce employment due to the outflow of resources needed for debt repayment (Saungweme, Odhiambo & Camerero, 2019). On their part, Eke and Akujuobi (2021) also warn that high debt levels can cause inflation and debt crises, which crowd out investment and slow growth. Gimba, Eche, and Awogbemi (2024) add that inflation caused by debt makes it harder to maintain stable investment and savings.

Foreign loans, especially from multilateral institutions like the IMF, World Bank, and African Development Bank, have been crucial in financing development in low- and middle-income countries. These institutions

offer concessional loans to help fund infrastructure and boost economic growth (Iyoha, 1999; Were, 2001). African countries, including Nigeria, often borrow from these multilateral sources: the World Bank Group, African Development Bank Group, Arab Bank for Economic Development in Africa, European Development Fund, Islamic Development Bank, and International Fund for Agricultural Development (Nwala & Saleh, 2021). These loans usually come with low interest rates and long repayment terms to help reduce poverty and support development.

Nigeria's foreign borrowing began in 1958 with a $28 million loan from the World Bank for a railway project (Ekpe, 2020). After receiving debt relief in 2005, Nigeria's foreign debt grew rapidly—from N438.59 billion in 2007 to N7,759.20 billion in 2018 (Etim et al., 2020), reaching N63,072.07 billion by 2024Q2 (DMO, 2024). Over half of this debt (N31,792.76 billion, or 50.41%) is owed to multilateral creditors.

The main goal of Nigeria's foreign borrowing is to support domestic funds in order to drive economic recovery and growth (Pegkas, 2018). However, experts are divided on its effectiveness. Some argue it leads to macroeconomic instability, low productivity, and high debt servicing costs (Ikwuo et al., 2024). Others believe it can promote growth by financing infrastructure (Rewane, 2019; Nwala & Saleh, 2021). While foreign loans are encouraged as a tool for growth (Ashakah et al., 2025; Nwoye et al., 2023), not all loans have a positive impact on the economy (Gimba, Eche & Awogbemi, 2024). This study aims to analyse the impact of multilateral debt on Nigeria's economic growth from 2007Q1 to 2024Q2. The hypothesis is that multilateral debt has no significant effect on Nigeria's economic growth.

LITERATURE REVIEW

Foreign Debt

Arnone, Bandiera, and Presbitero (2015) define foreign debt as loans obtained by a country from lenders outside its borders, typically in foreign currency, to fund gaps in development projects. Ogbeifin (2017) further explains that such debt results from the gap between domestic savings and investment. The author describes Nigeria's foreign debt as external loans owed by both public and private sectors, repayable in foreign currencies, goods, or services. However, this definition is outdated since private sector debts are no longer considered part of Nigeria's public debt due to the absence of government guarantees. Additionally, foreign debt doesn't always have to be repaid in the currency borrowed, as some loans, like those from the International Development Association (IDA), allow repayment in multiple currencies.

A few things to note here are that most forms of debt, whether foreign or otherwise, carry with them a repayment or amortization schedule that details principal and interest to be paid. Some interest rates on foreign loans, for example, are linked to LIBOR (London Interbank Offer Rate), and the actual rate will be LIBOR plus applicable spread, depending upon the credit rating of the borrower (Fosu, 2017). From these definitions, one could infer that foreign loans have two major features: lenders are resident abroad, and the currency for repayment is foreign denominated, with the exception of a few. In line with this, the study is in agreement with the definition by Arnone, Bandiera, and Presbitero (2015). The study concurs with the position that foreign debt in Nigeria refers to the total outstanding stock of all the multilateral debt, bilateral debt, and commercial debt.

Multilateral Debt

Multilateral debt is the debt owed by developing countries to the World Bank and International Monetary Fund (International Monetary Fund, 2018). In other words, it is the fraction of a country's total foreign debt owed to international financial institutions like the World Bank and the IMF (Gimba, Eche & Awogbemi, 2024). Public and publicly guaranteed multilateral debt includes loans and credits from regional development banks, the World Bank, and other multilateral and intergovernmental agencies (The World Bank, 2020). Although this definition is globally recognized, it is not only the World Bank and the IMF or regional bank loans that constitute multilateral loans. Contextually, this study perceives the word "multilateral debt" as the quarterly accumulated portion of Nigeria's foreign debt owed to multilateral agencies within the period of 2007Q1 to 2022Q2. Such multilateral agencies include the World Bank Group (International Development Association

and International Bank for Reconstruction and Development), the IMF, the African Development Bank Group (African Development Bank and Africa Growing Together Fund), the Arab Bank for Economic Development in Africa, the European Development Fund, the Islamic Development Bank, and the International Fund for Agricultural Development. This study posits the same definition of multilateral debt as defined by the World Bank (2020).

Economic Growth

Economic growth counts as a major national goal for countries, reflecting their development and advancement. For a country to achieve sustained growth, it must embark on investments in production, infrastructure, and human capital. In other words, the most important measure of the economic performance of a country is economic growth, which refers to the expansion of a country's output of goods and services. According to Roy (2017), the expansion of an economy's capacity to produce goods and services over time is what is referred to as economic growth. The growth or growth rate can be evaluated in nominal or real terms, with real terms taking into account inflation. Typically, overall economic growth is assessed by applying indicators such as gross domestic product or gross national product.

The main factors influencing economic growth are capital accumulation, technological innovation, and human capital. As argued by the pioneers of classical theory—Smith & Ricardo (1777)—labour, land, and capital are the drivers of economic growth. That is, for an economy to grow, there must be division of labour and capital accumulation. On the other hand, David Ricardo's theory focuses on the distribution of resources and diminishing returns.

In their view, the neoclassical economists, such as Solow (1956), established a technique that captures technological progress as an exogenous factor. The Solow Growth Technique argues that economic growth is influenced by capital, labour, and technology, where technological advancement is the primary driver. Contrary to the growth theories of classical and neoclassical economics, the developers of the endogenous growth theory, Romer (1986) and Lucas (1988), integrate innovation and technology into the techniques as endogenous variables. Romer's technique emphasizes research and development as well as knowledge spill overs, while Lucas (1988) highlights the role of human capital. This theory is of the view that policies that promote education and innovation can affect growth. In spite of this, other studies highlight various factors that impact economic growth. While Schumpeter's (1942) concept of creative destruction shows how innovation disrupts existing markets, driving growth through new technologies, Barro (1991) indicates that investment in physical capital increases productive capacity, enhancing economic growth. In their view, Mankiw, Romer, and Weil (1992) argue that investments in training and education improve workforce quality, fostering economic growth. Emphasizing institutional quality, Acemoglu and Robinson (2012) highlight the role of inclusive institutions in facilitating economic growth by creating an environment conducive to investment and innovation.

Empirical Review

To empirically explore the relationship between external loans stock and economic growth several studies covering divergent time periods, adopted different econometric models and tools, the outcome of which revealed different positions.

Leghrari et al. (2025), using annual time series data from 1998 to 2022, investigated the effect of external debt, including multilateral loan stock, on economic growth in Morocco. Applying advanced econometric techniques—Augmented Dickey-Fuller and Phillips-Perron tests, Johansen cointegration, and the Vector Error Correction Model—they highlighted the long-run relationship between the variables and concluded that external debt stock negatively impacted the gross domestic product (GDP) of Morocco. They called for effective management of external debt, with policymakers focusing on optimizing the allocation of borrowed funds to productive investments.

Rahimjon et al. (2025) evaluated the interplay between investment, external debt, and economic growth in five countries—Morocco, Algeria, Turkey, Tunisia, and Egypt—under the Organisation of Islamic Cooperation

(OIC). The study employed a panel data model to examine the nexus and interdependencies influencing these nations' economic advancement. By analysing theoretical perspectives, empirical evidence, and statistical data, the study investigated both the opportunities and challenges related to investment, external debt, and growth within the OIC context. The regression analysis revealed that external debt has both beneficial and adverse effects on investment and economic performance. The research emphasized the importance of understanding these dynamics within the specific circumstances of OIC member states. Overall, the study contributes to the field of international economics and provides valuable insights for policymakers aiming to formulate effective economic strategies.

Ikwuo et al. (2024) assessed the relationship between multilateral debt and economic development in Nigeria over the period 2000 to 2023. Employing the econometric technique of multiple regression analysis, the study found that the cointegration test showed the existence of a long-run equilibrium relationship between multilateral debt and economic development. However, it found that multilateral debt had a negative and insignificant effect on economic development in Nigeria. Consequently, the study recommended that the Federal Government exercise caution in accumulating more loans from multilateral sources. It was observed that the number of observations used in the analysis was not adequate to avoid spurious regression results.

Amadi and Edward (2024) used debt stocks of treasury bonds, bilateral, multilateral, and treasury bills as independent variables of public debt, aiming to analyze their impact on the Nigerian economy, proxied by the Human Development Index (HDI) from 1990 to 2021. Data for the study were obtained from the World Bank and the 2021 edition of the Central Bank of Nigeria's statistical bulletin. Applying ARDL and ECM estimation techniques, the study found that in both the short and long run, treasury bonds, treasury bills, and bilateral debt had positive effects on HDI in Nigeria, while multilateral loan stock had a negative impact. They suggested that, for public debt to contribute positively and significantly to the Nigerian economy, strong laws must be enacted by the National Assembly to prevent public officials from embezzlement and ensure sanctions are enforced, regardless of status.

Abille and Kilie (2023) examined the relationship between public debt and economic growth in Ghana using annual data from 1970 to 2019. Applying a nonlinear Autoregressive Distributed Lag (NARDL) bounds test, the study demonstrated that the accumulation of public debt, in both the short and long run, had an insignificant and negative effect on the growth of the Ghanaian economy. The study recommended that, to address the adverse impact of debt on Ghana’s growth potential, short- to medium-term debt management strategies should be strengthened. This could be achieved through the enforcement of the Public Procurement and Public Financial Management Acts.

Using annual data obtained from the World Bank, Hlongwane (2023) analyzed the effect of government debt on economic growth in South Africa. Utilizing an ex-post facto research design and various econometric techniques, the study revealed that short- and long-run equilibrium relationships exist between foreign debt and economic growth. It also found that foreign debt negatively affects economic growth in South Africa in both the short and long run. The study recommended improving South Africa’s productive capacity and infrastructure to boost exports, thereby expanding investment resources and minimizing dependence on debt.

Nwala and Saleh (2021) critically explored the effect of disaggregated foreign debt stock on economic growth in Nigeria, using quarterly data from the Debt Management Office and the Central Bank of Nigeria Statistical Bulletin for the period 2007 to 2020. By analyzing the long-run relationship among the variables through the Johansen Cointegration and Vector Error Correction Model (VECM) techniques, the study demonstrated the existence of a long-run relationship as well as a positive and significant effect of multilateral debt on economic growth.

Adusei (2021) explored the relationship between multilateral debt and productivity in East Africa, concluding that the impact of such debt depends heavily on transparency and governance in the debt allocation process. Ajayi and Edewusi (2020) applied Vector Error Correction Model (VECM) techniques using annual data from 1982 to 2018 to examine the relationship between public debt and economic growth in Nigeria. Their findings showed that foreign debt, especially multilateral loans, exerted an adverse effect on economic growth in both the short and long run. The study’s key recommendation emphasized prudent debt management and redirecting

loans towards investment and social services. A major critique of their work is the exclusion of data for 2019, which was already available from the Debt Management Office (DMO) and could have enriched the analysis.

In a related study, Alfred (2020) investigated the effect of total government debt on Tanzania's economic growth using a causal research design and 18 years of annual data (2000–2019). The data were sourced from the World Bank, the Bank of Tanzania, and the Ministry of Finance. Findings revealed that short-term foreign debt had a significant and progressive impact on growth, while long-term foreign debt had an insignificant effect. A weakness of the study is its failure to compare results with neighboring countries that experienced similar fiscal challenges.

Duro et al. (2020), using multiple regression on data from the CBN and DMO, focused on Nigeria's borrowing and its relationship with GDP over 1980–2018. Though the study concluded that IMF loans positively influenced GDP, it suffered a methodological flaw by using only IMF loans as a proxy for foreign debt, which is too narrow. Econometric robustness would have been improved by using cointegration and VECM techniques, as recommended by other scholars.

Broccolini et al. (2019) offered a broader perspective by examining the mobilization effect of Multilateral Development Banks (MDBs) using syndicated loan data from 1993–2017 across developing countries. The study found that MDBs significantly increased both the number and value of bank inflows, indirectly promoting growth. However, it did not disentangle growth-specific outcomes, leaving a gap regarding how much of these funds translated into productive development.

In South Africa, Mothibi (2019) applied ARDL techniques on data from 1980 to 2018 to assess the effect of foreign debt. Findings showed that excessive debt burden constrained economic growth. Nevertheless, the study had definitional flaws, as it incorrectly categorized domestic debt variables as foreign debt. Fosu (1999) conducted a cross-country analysis and found that countries with higher multilateral debt burdens recorded slower growth. The study showed that debt service payments significantly reduce government spending on education and health.

Farooq et al. (2017) adopted ARDL on time-series data (1976–2015) in Pakistan to study different components of debt, including Paris Club, multilateral, and bilateral debt. The study concluded that multilateral debt was adversely associated with economic growth and recommended favoring permanent and bilateral debts. One limitation of the study is its narrow data window, despite the availability of updated figures beyond 2015. Paul (2017) used Error Correction Model (ECM) techniques to analyze the impact of Nigeria's foreign loans on growth between 1985 and 2015. He concluded that foreign debt had a progressive effect and suggested its use for infrastructure. However, this recommendation is questionable, as not all foreign loans should be tied strictly to infrastructure. According to the Fiscal Responsibility Act (2007), foreign borrowing can also support human development projects, such as those funded under FADAMA. Senadza, Fiagbe, and Quartey (2017) used panel data for West African countries to assess the growth effect of multilateral debt. They found that effective debt management and absorptive capacity are essential for progressive growth outcomes.

Oleka et al. (2016), using time series data for the period 1981 to 2014, investigated the responsiveness of multilateral debt stock to gross domestic product in Nigeria. To analyze the data, they employed the Ordinary Least Squares method using EViews 8. Their analysis revealed a strong relationship between multilateral debt stock and GDP in Nigeria and considered multilateral loans as a key stabilizing factor in economic performance. To boost the productive base of the Nigerian economy, they recommended investing funds sourced from multilateral loans into infrastructural development projects.

Chinaemerem and Anayochukwu (2013) applied VECM on data from 1964 to 2011 to examine the disaggregated impact of foreign debt in Nigeria. The study discovered that multilateral debt had a positive impact, while Paris Club debt had an adverse impact on growth. A limitation of this work is its outdated debt classification, as most referenced debts were repaid before 2011. Moreover, it incorrectly proposed debt cancellation, a strategy that is obsolete in Nigeria's current debt sustainability framework. Chongo (2013) examined Zambia's debt burden and found that while multilateral loans contributed to economic stabilization programs, growth outcomes were minimal due to poor implementation of loan-funded projects.

Sulaiman and Azeez (2012) conducted a study on Nigeria and found that multilateral debt had a statistically significant adverse effect on economic growth when controlled for inflation and exchange rate, using ECM techniques. Akanbi and Du Toit (2011) studied Nigeria and South Africa using VECM and found that multilateral debt adversely impacted long-term GDP growth in both countries, though short-term effects varied. They recommended a sustainable borrowing framework backed by revenue growth.

Clements, Bhattacharya, and Nguyen (2003) explored how debt relief under the HIPC initiative impacted multilateral debt burdens in low-income countries. The results showed that multilateral debt reductions helped improve fiscal space and spurred economic growth in some countries, though the impact varied based on governance and policy environments. Reinhart, Rogoff, and Savastano (2003) found that countries with weak institutions are more likely to suffer adverse effects from multilateral debt due to poor debt management and low returns on borrowed investments. They argued that for debt to support growth, strong institutional frameworks must be in place.

Pattillo, Poirson, and Ricci (2002) examined 61 developing countries using panel data over several periods and found that high levels of foreign debt, especially from multilateral sources, have nonlinear effects on growth. While moderate debt can stimulate growth through investment, excessive multilateral debt becomes counterproductive, confirming the debt overhang theory. Serieux and Yiagadeesen (2001) investigated multilateral debt accumulation and growth stagnation in low-income countries. Their findings indicated that reliance on multilateral debt without corresponding increases in productive capacity constrained long-term growth. Were (2001) focused on Kenya's experience with multilateral and bilateral debt and found that multilateral loans had a statistically significant adverse effect on growth due to poor utilization and corruption. The study advocated strengthening institutions to ensure the effective use of borrowed resources.

Fosu (2010) examined debt-growth channels in Africa and found that foreign debt depresses investment, which in turn hinders growth—supporting the debt Laffer curve hypothesis. Iyoha (1999) analyzed the impact of foreign debt—particularly multilateral debt—on the economic growth of Sub-Saharan African countries. Using macro-econometric techniques and time-series data, the study found that high levels of multilateral debt reduced investment and productivity in the long run, thereby shrinking growth. The study recommended enhanced debt management and efficient utilization of borrowed funds. Krugman (1988) emphasized the role of the debt overhang in limiting the effectiveness of multilateral lending. He argued that expected future taxes to repay large debts discourage private investment, particularly in countries highly exposed to multilateral financial institutions.

Similarly, Ndulu and O'Connell (1999) linked the ineffectiveness of multilateral loans to weak public sector institutions in Africa, where borrowing is often politically motivated rather than economically driven, leading to growth stagnation. Barro (1997) analyzed public finance and showed that growth is adversely correlated with high levels of debt-to-GDP ratios, particularly multilateral debt in developing economies, due to repayment obligations that affect domestic policy space.

Gap in Literature

As reviewed empirically, most of the research conducted on the effect of external debt on growth in Nigeria has analysed the impact of total external debt (comprising bilateral, multilateral, and commercial debt stocks, regressed together) on economic growth—proxied by gross domestic product (GDP) (Nwala & Saleh, 2021). They used multiple linear regression to predict the behaviour and long-run impact of the independent variable—total external debt—on the dependent variable—GDP. In addition, the annual data used in their studies ended in 2022.

Furthermore, the only available but nearly outdated study that explored the effect of multilateral debt on economic growth in Nigeria for the period 1981–2014 is that of Oleka et al. (2016). To bridge the gaps identified, this study emphasizes the effect of only multilateral debt stock on economic growth. By using up-to-date quarterly data, it aims to determine whether the contribution of this debt source to economic growth in Nigeria is positive and significant or not.

Another distinct and important feature of this study is the inclusion of other relevant variables—namely, the exchange rate, inflation rate, and debt servicing. Therefore, the study seeks to contribute to the existing literature and help policymakers better understand the positive or negative contribution of multilateral debt stock to the growth potential of the Nigerian economy.

Theoretical Framework: Public Choice Theory of Debt (Buchanan and Wagner, 1977)

This theory postulates that debt is the result of political incentives rather than economic efficiency. Politicians may borrow to gain political popularity, often leading to the suboptimal use of debt resources and inefficient fiscal policy. The theory emphasizes the political economy dimension of debt accumulation and is particularly relevant in countries with weak institutions, such as Nigeria, where debts are not necessarily assessed based on productive motives.

METHODOLOGY

This study adapts debt-growth empirical techniques similar to those used by Chongo (2013), Bamidele et al. (2024), and Iyoha (1999), who examined the impact of foreign debt and debt servicing on economic performance in Sub-Saharan Africa and Nigeria, relying heavily on public choice theory. Following this line of research, and using quarterly data ranging from 2007Q1 to 2024Q2, the study models real GDP as a function of multilateral debt, debt servicing, and relevant control variables such as inflation and the exchange rate.

To empirically investigate the impact of multilateral debt on economic growth in Nigeria, the following techniques have been specified.

$RGDP_t=F\ (MUD_t, INF_t\ EXH_t\ DBS_t\ )$…...……..…….....(1)

Turning equation 1 into stochastic technique yields

$RGDP_t= \beta_0+ \beta_1 MUD_t + \beta_2 INF_t+ \beta_3 EXH_t+ \beta_2 DBS++ e_t$……..(2)

Where:

$RGDP_t$ is Real gross domestic product – growth proxy (**dependent variable**)

MUD_t is multilateral debt (**Independent Variables)**

DBS_t is Debt service (**Independent Variables)**

INF_t **(control variable)**

EXH_t **(control variable)**

β_0 is intercept, β_1, β_2 are the slope of the coefficient of independent variables and e_t represent the error term.

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

$$\Delta RGDPt = \alpha 0 + \sum_{i=1}^{n} \alpha 1i \Delta MUDt - i + \sum_{i=1}^{n} \alpha 2i \Delta DSSt - i + \sum_{i=1}^{n} \alpha 3 \Delta INFt - i + \sum_{i=1}^{n} \alpha 4 \Delta EXHt - i + \lambda ECMt - 1 + \varepsilon t$$

Where: Δ = first difference operator ε_t = error term

ECM_{t-1} = error correction term obtained from long-run co-integration equation

λ = speed of adjustment parameter (must be adverse and significant)

The coefficient of the ECM (λ) must be adverse and statistically significant to confirm the existence of a long-run equilibrium relationship.

This approach aligns with methodologies in Chongo (2013), who used VECM to estimate debt-growth relationships in Zambia, and Adofu and Abula (2010), who evaluated Nigeria's debt servicing impact on growth using time series econometrics.

RESULT ANALYSIS

Unit root test

The results from the ADF unit root test show that all variables under study are non-stationary at level, as their ADF test statistics are greater (less adverse) than the critical values at the 5% significance level and their associated p-values are all greater than 0.05, indicating a failure to reject the null hypothesis of a unit root.

Table 4.1 Unit root test

Level				**First Difference**			
Variables	ADF T-Stat.	C.V @ 5%	Prob.	ADF T-Stat.	C.V @ 5%	Prob.	Status
(RGDP)	-0.332147	-2.904198	0.7408	-7.096856	-2.904848	0.0000	1(1)
(MD)	1.539439	-2.917650	0.9992	-5.951882	-2.917650	0.0000	1(I)
(DBS)	-0.931421	-2.915522	0.7708	-9.413227	-2.916566	0.0000	1(I)
(INF)	1.535151	-2.904198	0.9993	-5.381687	-2.904848	0.0000	1(I)
(EXH)	2.440716	-2.904198	1.0000	-6.907493	-2.904848	0.0000	1(I)

Source : Author's computation using E-view 9

In spite of this, upon first differencing, all variables became stationary; This implies that all variables are integrated of first order, which further called for longrun testing

Johansson Co-integration Results

The study runs the Johansen cointegration test on the log-transformed variables. The results from both the Trace and Max-Eigenvalue statistics suggest the presence of long-run relationships among the variables. In particular, the Trace test indicates the presence of three cointegrating equations at the 5% significance level, as the test statistics for "None," "At most 1," and "At most 2" (128.67, 57.770, and 31.382, respectively) all exceed their critical values (69.818, 47.856, and 29.797), and the corresponding p-values are below 0.05.

Table 4.2: Johansen Co-integration

Sample (adjusted): 2007Q1 2024Q2								
Series: LRGDP LMUD LDBS INF EXH								
	Unrestricted Co-integRank Test (Trace)				Unrestricted Co-int Rank Test (Max Eigenvalue)			
Hypothesized	Trace	0.05		Remarks	Max-Eigen	0.05		Remarks
No. of CE(s)	Statistic	Critical Value	Prob.**		Statistic	Critical Value	Prob.**	
None *	128.67	69.818	0.0000	cointegrated	70.904	33.876	0.0000	cointegrated
At most 1 *	57.770	47.856	0.0045	cointegrated	26.387	27.584	0.0705	Not cointegrated
At most 2 *	31.382	29.797	0.0326	cointegrated	22.037	21.131	0.0372	cointegrated
At most 3	9.3458	15.494	0.3344	Not cointegrated	9.2780	14.264	0.2637	Not cointegrated
At most 4	0.0677	3.8414	0.7947	Not cointegrated	0.0677	3.8414	0.7947	Not cointegrated
	Trace test indicates 3 cointegrating eqn(s) at the 0.05 level				Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level			

Source: Authors Computation using E-view 9

Meanwhile, the Max-Eigenvalue test identifies two cointegrating equations, as the statistics for "None" (70.904) and "At most 2" (22.037) exceed their respective critical values (33.876 and 21.131), with significant p-values of 0.0000 and 0.0372. However, for "At most 1," the Max-Eigenvalue statistic (26.387) falls just below the critical value (27.584), with a p-value of 0.0705, indicating no significant cointegration at that rank.

Overall, the evidence strongly supports the existence of at least two long-run equilibrium relationships among the variables, justifying the application of a Vector Error Correction Model (VECM) to capture both short- and long-run dynamics. The optimal lag length was selected based on the Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ). Both the Trace and Max-Eigenvalue tests indicate the presence of cointegrating equations at the 5% significance level.

Vector Error Correction Techniques

The VECM results reveal that the Error Correction Term (ECT) is negative and statistically significant, with a coefficient of -0.021052 and a p-value of 0.0233. This suggests a stable long-run equilibrium and that deviations from this equilibrium are corrected at a speed of approximately 2.1% per quarter. This result is in line with studies such as Iyoha (1999) and Audu (2004), who found significant speed-of-adjustment coefficients in their VECM analyses when examining debt and growth in Nigeria. The negative and significant ECT indicates that RGDP adjusts back to the long-run equilibrium after a short-run shock, reinforcing the importance of including an error correction mechanism in the model.

In the short-run causality framework, multilateral debt shows a significant positive impact on RGDP with a lag of two quarters, as indicated by a p-value of 0.0479. This suggests that multilateral debt has a stimulating effect on economic growth in the short term. This finding supports the arguments by Fosu (1999) and Were (2001), and corroborates the findings of Nwala & Saleh (2021) and Oleka et al. (2016), that debt inflows—especially those of a multilateral nature—can enhance investment and growth when appropriately managed. However, it contrasts with the findings of Ikwuo et al. (2024), who demonstrated that multilateral debt has a negative and insignificant contribution to growth.

Table 4.3: Vector Error Correction

				Wald Short Run Causality Test	
DLRGDP as Explained variable				**Null Hypothesis**	**P-values (X^2)**
Variable(s)	Coeff	P-values	R-square =	C(6)=C(7)=C(8)=C(9)=0	0.2424
ECT C(1)	-0.021052	0.0233	0.294297	C(10)=C(11)=C(12)=C(13)=0	0.1330
D(LRGDP(-4))	0.323538	0.0524	P(f-stat) =	C(14)=C(15)=C(16)=C(17)=0	0.4851
D(LMUD(-2))	0.671345	0.0479	0.471874	**Post estimation Test**	
D(LDBS(-2))	-0.023592	0.7238		**Test**	**P-values**
D(EXH(-1)	-0.003206	0.0237		Normality(J-B=51.70294)	0.0000
D(LINF(-1))	-0.419758	0.2562		Serial Correlation LM Test	0.0842
				Heteroscedasticity ARCH	0.0960

Source: Authors Computation using E-view 9

Fascinatingly, the exchange rate (EXH) at lag 1 also shows a significant negative effect on RGDP, with a p-value of 0.0237, implying that exchange rate depreciation adversely affects economic growth in the short run. This aligns with the findings of Aliyu (2009), who both found that exchange rate volatility negatively influences macroeconomic stability in Nigeria. The implication is that depreciation of the country's currency makes imports more expensive and raises production costs, thereby shrinking output. In contrast, Obadan (2006) found that depreciation could promote export competitiveness and boost GDP—a position that may hold under conditions of stronger export bases, which Nigeria arguably lacks in a diversified sense.

Meanwhile, other variables such as LDBS (log of debt service) and LINF (log of inflation) are not statistically significant in explaining variations in RGDP in the short run (p = 0.7238 and p = 0.2562, respectively). The insignificance of debt service resonates with Adesola (2009) and Ashaka et al. (2025), who contended that

Nigeria's debt servicing has not had a significant short-term impact on growth, partly due to debt restructuring and moratoriums. Similarly, the non-significant effects of these explanatory variables align with Ezeabasili et al. (2011) and Amadi and Edward (2024), who suggested that inflation and multilateral debt may not have immediate effects on output.

The R-squared value of 0.294 indicates that about 29.4% of the variation in RGDP is explained by the included regressors in the short run. Although this is a moderate value, it is typical in macroeconomic models using quarterly data. The post-estimation diagnostics further validate the model's adequacy: the normality test (Jarque-Bera = 51.70, p = 0.0000) indicates non-normality, which is not uncommon in large-sample economic models. Nevertheless, the serial correlation LM test (p = 0.0842) and the ARCH heteroskedasticity test (p = 0.0960) both exceed the 5% threshold, suggesting the absence of autocorrelation and conditional heteroskedasticity at acceptable levels.

In summary, the short-run dynamics reveal a statistically significant feedback mechanism toward long-run equilibrium. The findings show that multilateral debt contributes positively to short-term growth, while exchange rate volatility undermines it—thus, invalidating the study's null hypothesis. These results not only reflect Nigeria's sensitivity to external economic variables but also underscore the importance of coherent policies in managing debt and exchange rates for sustainable growth. The mixed outcomes also highlight the contextual dependency of these relationships, as previous studies have shown divergent results depending on timeframes, econometric techniques, and country-specific factors.

Causality Results

The Toda-Yamamoto causality test offers an alternative and robust approach to evaluating the direction of causality among variables without the need for pre-testing for stationarity or cointegration, thereby avoiding potential pre-test biases. The test results show a unidirectional causality from multilateral debt (MUD) to real gross domestic product (RGDP), as the χ^2 value is 9.4434 with a p-value of 0.0089. This suggests that variations in multilateral debt significantly influence economic growth. Conversely, RGDP does not Granger-cause multilateral debt, as indicated by a p-value of 0.2988. These results reinforce the proposition that debt-driven inflows—particularly concessional loans from multilateral institutions—can act as catalysts for growth when well managed.

Table 4.4: Toda Yamamoto Causality Test

Null Hypothesis	Chi-square	Df	Prob	Decision
Mud Vs Rgdp	9.4434	2	0.0089*	Unidirectional Causaity
Rgdp Vs Md	2.4158	2	0.2988	

Source: Author's Computation using E-view 9.

This result aligns with the findings of Fosu (1996) and Iyoha (1999), who documented that foreign borrowing, particularly from multilateral sources, can promote growth in sub-Saharan Africa. However, this diverges from the findings of Ajayi and Oke (2012), who noted that such debts can become a drag on growth due to high servicing costs and potential mismanagement.

CONCLUSION AND RECOMMENDATIONS

The results of the ADF, Johansen Cointegration, VECM, Wald Short-Run Causality, and Toda-Yamamoto Causality tests reveal a complex but informative relationship between Nigeria's multilateral debt stock and economic growth. All variables were found to be integrated of order one, suggesting non-stationarity at level but stationarity at first difference. The Johansen cointegration test confirms the existence of long-run equilibrium relationships, particularly highlighting that multilateral debt, debt servicing, inflation, and exchange rate move together with real GDP over time. The VECM error correction term was significant and negative, indicating convergence toward equilibrium. Short-run dynamics from the Wald test show that multilateral debt and exchange rate significantly affect RGDP, while inflation and debt service have minimal

impact. Additionally, the Toda-Yamamoto causality test indicates unidirectional causality from multilateral debt, debt service, and exchange rate to economic growth, affirming that these variables are key drivers of Nigeria's macroeconomic performance.

Based on these findings, the Nigerian government should strengthen its debt management frameworks by prioritizing concessional multilateral borrowing and ensuring that such loans are directed toward productive infrastructure and development projects. Improving fiscal transparency, institutional quality, and exchange rate stability is crucial for maximizing the benefits of foreign finance. Given the weak causality between inflation and growth, monetary policy should be complemented with structural reforms in agriculture, energy, and public services to curb cost-push inflation. Furthermore, efforts must be made to enhance revenue mobilization, reduce overreliance on borrowing, and ensure that debt obligations do not crowd out essential social and capital expenditures.

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