
The Impact of Debt Servicing on Economic Growth in Nigeria

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Abstract

Any country in the globe targets to achieve economic growth and development. Thus, this can only happen if a country has an abundant resource and utilizes them efficiently and effectively. In developing countries, like Nigeria, the resources to finance the optimal level of economic growth are in short supply; due to low domestic savings, low tax revenues, low productivity and light foreign exchange earnings. The study investigates the impact of debt servicing on economic growth in Nigeria from 1980 to 2022. The Zivot-Andrew unit root test indicates that real gross domestic product, interest rate, external debt and exchange rate are integrated of order one while external debt servicing is integrated of order zero. The study employed nonlinear ARDL model and the result show that external debt servicing and exchange rate have positive and statistically significant effect on the real gross domestic product while external debt has a negative and statistically significant effect on the real gross domestic product. Therefore, the current study concludes that there exists an asymmetry impact in the long-run of debt servicing in the Nigerian economy. The study recommends that Nigerian debt be it internal or external should be utilize judiciously and investment should be made so that the economic growth could be achieved.

Keywords: Economic growth, External debt, External debt servicing

JEL Classification: O40, H63, H63

1 Introduction

Any country in the globe targets to achieve economic growth and development. Thus, this can only happen if a country has an abundant resource and utilizes them efficiently and effectively. In developing countries, like Nigeria, the resources to finance the optimal level of economic growth are in short supply; due to low domestic savings, low tax revenues, low productivity and light foreign exchange earnings. Basically, for those reasons, many developing countries like Nigeria yearning for economic growth inevitably haunt external and internal finance to bridge the gap between their savings and investments. Every country in the world suffers from high

levels of debt service, which exacerbates the country's issues by widening the fiscal deficit caused by the need to fund the national budget. High debt servicing levels pose a serious danger to a country's economy since principle and interest payments consume a disproportionate share of public resources. The amount of outstanding foreign debt for the country was US\$28.35 million in 2001, or 59.4% of GDP, compared to US\$8.5 million in 1980, or 14.6% of GDP (WDI 2013). When it was believed that the country's debt problem had peaked in 2003, the federal government issued US\$2.3 billion to pay down the country's outstanding foreign borrowings. Nigeria owed the Paris Club of creditors US\$30.85 billion, of which 60% (US\$18 billion) was written off in 2005. In the majority of fiscal years, these anticipated revenues are not realized as anticipated. There will therefore be a deficit, which the government will attempt to finance by taking on debt in order to fund the budget while both completing the capital project and meeting ongoing needs. Due to poor productivity, low investment, low level of development of the Nigerian capital market, and insufficient savings, the necessary financial resources may not be available locally. The federal government's total expenditure for servicing its domestic debt in the fourth quarter of 2020 was N604.1 billion, a decrease from the N610.3 billion spent in the same quarter of 2019, or 52.3% of federal revenue gathered during that time (Debt Management Office, 2021). Moreover, from January to March 2020, interest payments on domestic debt were nearly twice as much as the amount made available for federal capital projects. In contrast, the first quarter of 2020 saw US\$357.3m (N109bn) in external debt-service payments to creditors of both the federal government and sub-national governments. This amount is quite low when compared to the cost of local debt, especially considering the size of the stock of external commitments. For this reason, Nigeria's debt-management approach is expected to continue depending heavily on the policy of moving from domestic to external debt. Large amounts of money are used to pay down public debt, which can burden domestic production and reduce the resources available to carry out governments' growth-oriented economic policies. As a result, meaningful GDP growth activities may be hampered. These factors will likely have an impact on economic growth. Nigeria's inefficient use of both international and domestic loans has made debt servicing a major burden. A number of factors, including political, economic, and policy instability, corruption, misappropriation and embezzlement of public funds, a lack of commitment to sound economic philosophy, the politicization of economic projects, and a lax legal framework, may have contributed to the ineffective application of debt (Harrison, Momodu & Tamunomieibi 2000). Low capital formation, the nation's underdevelopment, and the rise in the debt profile are the results of this. Between 1997 and 2004, Nigeria's external debt stock increased from US\$28454.8 million to US\$31041.6 and US\$37883.1 million, representing 80.3, 64.67, and 52.58 percent of GDP, respectively. The main objective of the study is to investigate the impact of debt servicing on economic growth in Nigeria. The rest of the paper is arranged as follows: literature review which is the second part of the paper, methodology which discussed the model employed in the analysis and is the part three of the study paper, part four of the paper is presentation and analysis of the empirical findings and the part five discussed the conclusion and recommendations of the study.

2 Literature review

This section presents conceptual literature, theoretical literature and empirical literature relevant to the study.

2.1 Conceptual Literature

Debt servicing

The amount required to cover a loan's principal and interest payments over a specific time period is known as debt service. According to the International Monetary Fund (2003), debt servicing refers to the necessary payments of principle and interest on outstanding obligations. Debt servicing is the sum required to pay interest and redeem principal on a loan when it becomes due, according to Adesola (2009). According to DMO (2016) external debt servicing is a type of embedded tax that stifles economic progress and makes investment nearly impossible. A significant source of worry over Nigeria's debt servicing is the country's historically high and continuing trend of interest payments as a percentage of total debt service.

External Debt

The idea of borrowing is as old as the Bible. The Israelites borrowed all they required from the Egyptians as they prepared to leave the country of their captivity. Countries borrow money in the contemporary period when they are unable to save enough money domestically to fund productive endeavors. These foreign loans are intended to replenish domestic savings and enable the borrowing nations to engage in economic endeavors (Ezeabesili, 2011). In order to bolster its external reserves position and fortify its external liquidity position going forward, a nation may also opt to borrow short-term, from outside sources, to cover current account deficits resulting from external disruptions. As long as borrowing from abroad is used to boost the economy's productive potential, it is considered both desirable and required to boost economic growth (Udoffia & Akpanah, 2016). The major purpose of external debt is to supplement domestic funding sources for a nation's development and other demands. It is an indispensable source of capital. The majority of the time, a nation that lacks the foreign exchange and domestic savings necessary to meet its developmental and other national goals will acquire external debt. Nonetheless, the effort made by a debtor nation to repay the debt becomes extremely important since it may lead to bad debt if the foreign debt is not utilized effectively and productively. The World Bank (2004) defines external debt as the total amount owing to non-residents that must be repaid in the form of foreign exchange, goods, or services. Therefore, the mobilization of funds and resources produced outside of one's own country is referred to as external debt. According to Udoffia and Akpanah (2016), external debt refers to packages that include managerial and technical requirements as well as financial requirements that come from outside the nation. These packages are meant to encourage economic growth and development and are repaid in foreign currency at a later date.

Domestic Debt

According to Asogwa (2008), debt is an obligation arising from a contract or from cumulative borrowing that is hoped to be repaid in the future. The government views debt as originating from both domestic (using one or more instruments and denominated in local currency) and external (originating from outside the nation and denominated in foreign currency) sources. The federal government, state governments, and municipal governments of Nigeria are the ones who take on domestic debt. Though practically speaking, states and local governments have limited ability to create debt instruments. Treasury bills (TBs), Treasury certificates (TCs), Federal Government development stocks (DS), bonds, and means advances are the principal types of domestic debt instruments in Nigeria. While bonds and ways-and-means advances are not marketable or negotiable and are instead owned exclusively by the Central Bank of Nigeria, TBs, TCs, and DS are. (Adofu & Abula, 2010). Typically, these loan instruments are employed for local borrowing to bridge the resource difference between investment and savings. According to Alison (2003), there are three reasons why there is domestic government debt: funding the budget deficit, implementing monetary policy (i.e., trading treasury bills on the open market), and creating new financial instruments to expand the financial market. The majority of domestic public debt is owed to holders of government securities like Treasury Bonds and Bills. Typically, governments borrow money through the issuance of securities such as bills and bonds. In order to pay off maturing loans (Ponzi games), which is common with domestic debt, and when expected revenue projections fall short of projected expenditures, governments borrow money (Babu, Kiprop, Kalio & Gisore, 2015). According to Fry (1997), a major contributing reason to the rising amount of debt is the need on outside resources to supplement capital formation in the domestic economy. The amount of debt incurred increases proportionately with interest payments and current account deficit.

2.2 Theoretical framework

Debt Overhang Theory

In 1988, Krugman created the debt overhang theory. The theory clarifies a situation in which a nation's debt exceeds its potential for future repayment. The underlying premise of the hypothesis is that the predicted debt servicing may likely reduce the function of the country's output level if its loan amount exceeds its ability to repay. As a result, the nation's existing foreign debts devour a portion of its investment revenue, discouraging both fresh foreign investments and local ones. According to the debt overhang theory, a nation's ability to repay its debt will be hampered by debt servicing, which will restrict investment and impede economic growth (Gordon & Cosim, 2018). A situation known as "debt overhang" occurs when a nation's debt load is so great that it is unable to take on additional loans to fund ongoing projects. According to Coccia (2017), the theory holds that public debt and debt servicing have an impact on economic growth by prioritizing debt repayment over other spending. Overspending on governmental debt affects the home economy in two ways. The first is the interest rate hike and crowding out effect. A requirement to pay high interest can increase a nation's financial deficit. Large debt repayment will impede growth by cutting back on public resources that could be spent on productive projects that promote growth (Yusuf & Mohammed, 2021).

2.3 Empirical literature

Ndu (2024) examined the effect of debt servicing on economic growth in Nigeria. Ordinary least square regression was adopted. The findings revealed that both Foreign Debt Servicing and Domestic Debt Servicing have significant effect on GDP. Therefore, the study concludes that debt servicing in Nigeria should be managed with utmost sincerity to stimulate economic growth. Suffice it to say that, domestic and foreign debt servicing has become obscenity rather than a blessing to the Nigerian economy, as it has not proven to salvage the economic woes of the Nigeria. The study recommends accordingly that, Domestic and foreign debt servicing payments should be managed in such a manner that it would not hinder economic growth of Nigeria.

Yusuf and Mohd (2023) examined the asymmetric impact of public debt on economic growth in Nigeria from 1980 to 2020 using the Nonlinear Autoregressive Distributed Lag method. Empirical evidence indicated that external debt have a significant positive and symmetric impact on economic growth in the long and short run, while debt service payment supporting the debt overhang hypothesis activated a symmetric effect that stifle growth. Domestic debt retarded growth asymmetrically in the short term and linearly over the long term. Foreign reserve holding, on the other hand, had an asymmetric long-run influence and a symmetric short-run impact on growth motivation. To mitigate the negative effects of unsustainable public debt, the study advocated for fiscal reforms that effectively reduce deficit financing to keep the level of government debt low and be able to respond robustly to an economic shock, improve domestic revenue generation and infrastructure spending, and strengthen governance practices and institutions.

Idris and Aliyara (2022) examined the impact of debt burden on economic growth in Nigeria for a period of 30 years, (1990 to 2020), and ordinary least square statistical tool was used to test the relationship between Nigeria's debt burden and its economic growth. The study found that there is a positive, but insignificant relationship between foreign debt stock (FDST) and Gross Domestic Product, a negative, and insignificant or weak relationship between foreign debt servicing (FDSR) and Gross Domestic Product. The study concluded that the aggregate of Nigeria's debt burden does significantly affect its economic growth. The study recommends that acquisition of foreign debt should be exclusively on economic considerations.

Otiko and Iheonkhan (2022) examined the effect of debt servicing on economic growth in Nigeria with corruption as a moderator. Debt servicing was proxy by foreign and domestic debt servicing, while economic growth was proxy by gross domestic product. Also, corruption was measured using the corruption perception index of the Transparency International from 1990 to 2020. The study used multiple regression analysis technique for the purpose of data analysis. The result of this study showed that foreign debt servicing has significant effect on GDP, while the domestic debt servicing does not have any significant effect on GDP in Nigeria. The study also, showed that corruption as a moderator a negative indirect effect on relationship between debt servicing and economic growth in Nigeria. Based on the findings, the study concluded that debt servicing can be used as a predictor of economic growth in Nigeria.

Akanbi, Uwaleke, and Ibrahim (2022) investigated the relationship between external debt service and economic growth in Nigeria from 1981 to 2020. The method for estimation was the Auto-Regressive Distributed Lags (ARDL) model. The ARDL bound test results showed there was co-integration. The speed of change between the short-run and long-run of the co-integrating equations was 88.86%. The study provided evidence of a negative relationship between external debt service and economic growth although this is not statistically significant. The result shows resource depletion effect of external debt services on growth. External debt stock has a positive but not significant relationship with growth. There is a positive but not significant relationship between external reserves to external debt ratio with growth. Debt service to export ratio has a positive relationship with growth. The study recommends that policy makers in Nigeria should develop a methodology to compare the return on external debt to be incurred with the cost of debt so that gains that may eventually offset the cost of debt service.

Awol (2022) assessed the impact of public external debt stock on economic growth of Ethiopia over the year from 1971 to 2018. The study employed Auto regressive distributed lag (ARDL) approach to real GDP data as a function of stock of public external debt, public external debt servicing, fixed capital formation, inflation rate, export, real effective exchange rate and trade openness. The empirical finding results from the study revealed that public external debt stock has an adverse significant impact to economic growth of Ethiopia both in the long run and short run with a coefficient of 0.133 and 0.050 respectively, which possess a greater challenge for the growth of a country. While public external debt servicing has positive significant impact to real GDP both in short run and long run with a positive coefficient of 0.0433 and 0.1356 respectively. On the other hand, the variable fixed capital formation, inflation rate, export and real effective exchange rate has positive significant impact to economic growth of Ethiopia. Thus, the study recommended that the government should minimize the reliance on external debt by diversifying the sources of finance through mobilizing its own resource domestically and enhance the exports of country and reduce imports of luxuries goods and also, they should conduct those measures which minimize fiscal deficit so as to tackling the problem of severe external debt burden.

Akanbi, Uwaleke, and Ibrahim (2022) investigated the relationship between external debt service and economic growth in Nigeria from 1981 to 2020. The ARDL bound test results showed there was co-integration. The speed of change between the short-run and long-run of the co-integrating equations was 88.86%. The study used debt overhang theory, the neo-classical theory and endogenous theory as the theoretical framework. The study provided evidence of a negative relationship between external debt service and economic growth although this is not statistically significant. The result shows resource depletion effect of external debt services on growth. External debt stock has a positive but not significant relationship with growth. There is a positive but not significant relationship between external reserves to external debt ratio with growth. Debt service to export ratio has a positive relationship with growth. The study recommends that policy makers in Nigeria should develop a methodology to compare the return on external debt to be incurred with the cost of debt so that gains that may eventually offset the cost of debt service. This methodology should be a policy or legislation.

Edeminam (2021) examined the impact of public debt on economic growth in Nigeria using annual time series data from 1990 to 2019. The variables are Real GDP, public debt, Inflation, debt to GDP ratio, debt servicing to GDP ratio, and exchange rate. Empirical results showed that the impact of public debt on economic growth was negative and significant in the long run. The impact of public debt on economic growth was negative but insignificant in the short run. In addition, the impact of ratio of debt servicing to GDP was significant and negative in the short and long run. There was no causality between public debt and economic growth.

Yusuf and Mohd (2021) investigated the effect of government debt on Nigeria's economic growth using annual data from 1980 to 2018. The empirical results showed that external debt constituted an impediment to long-term growth while its short-term effect was growth-enhancing. Domestic debt had a significant positive impact on long-term growth while its short-term effect was negative. In the long term and short term, debt service payments led to growth retardation confirming debt overhang effect. The findings suggested that the government should direct the borrowed funds to the diversification of the productive base of the economy. This will improve long-term economic growth, expand the revenue base and strengthen the capacity to repay outstanding debts when due. Fiscal improvements that encourage domestic resource mobilization, efficient debt management strategies and reliance on domestic debt rather than external debt for increased deficit financing to engender greater growth are the main contribution of the study.

Adegboyega (2021) examined the impact of debt service payments on economic growth in Nigeria. The study made use of data collected from Central Bank of Nigeria (CBN) and World Bank Database from 1981 to 2019 using ARDL regression method of analysis. The results showed that debt service payment (TDS_GNI), exchange rate (EXR), external debt (EXTD_GNI) and foreign direct investment that debt service obligation should not be allowed to rise more than foreign exchange earnings and that the loan contracted should amongst others the needs for the country to develop a framework and strategy for closing its resource gap in order to achieve the objective of halving poverty by 2030.

Grace, Oluwayemisi, and Femi (2019) examined the effect of external debt on economic growth in Nigeria under the period of 37 years (1981-2017). The study specifically examined the influence of external debt, external debt service payment and exchange rate on economic growth proxy as real gross domestic product. The study employed least square econometric technique to ascertain the relationship between external debt variables and economic growth in Nigeria. The study found that external debt and external debt service payment have negative effect on economic growth while exchange rate has positive effect on economic growth in Nigeria. The coefficient of multiple determinations (R²) showed that approximately 77% of variations in economic growth are explained by the explanatory variables (EXTD, EXTDS and EXR) while the remaining 23% is accounted by factors not specified in the model. However, The Durbin Watson correlation test indicated that there is positive autocorrelation in the model which implied there is about 23% missing variables in the model. The conclusion that may be drawn from the study is that external debt has negative effect on economic growth in Nigeria. Hence, it

is recommended that Debt Management Office should set mechanism in motion to ensure that loans were utilized for purposes for which they were acquired and channel towards productive uses and sourcing external debts should be considered as a means of long run development not just for solving short run problems.

Olusegun, Oladipo, and Omotayo (2021) examined debt service and its impact on economic growth in Nigeria. The secondary data were obtained from the debt management office which covered the period of 30 years spanning from 1990-2020. The findings revealed among other things that; there was presence of co-integration (long-run relationship) among the dependent and all the explanatory variables which is a clear indication that working debt servicing has positive and significant impact on economic growth of the country both in short and long run if properly managed. It was concluded that debt servicing has significant impact on the economic growth due to his positive relationship with gross domestic product, while exchange rate reflected a negative significant relation to Gross domestic product. This study recommends among others that government should ensure that any debt both internal and external debt should be deal that will open Nigeria to greater trade and investment and can stimulate the economic growth of the country.

Muhammad and Abdullahi (2020) investigated the impact of external debt servicing on Nigeria's economic growth through a time-series data between 1985 to 2018 which was managed with Autoregressive Distributive Lag (ARDL) model. Results of the study indicated that in the long-run, external debt servicing will negatively affect economic growth. That is an increase in external debt servicing lead to a decline in economic growth. The study suggests that debt service requirement should not be allowed to increase above the debt stock and, the contracted loan should be devoted to infrastructure development through efficient and judicious utilization. Orjinta and Nwadiolor (2016) examined the effect of debt service on economic growth using a time series data of 20 years (1996-2015). The data collected were analysed using unit root, co-integrations and ordinary least square regression. The analysis result revealed a significant long run relationship between real gross domestic product (RGDP) and external debt (EDEBT) and debt service (DEBT) and an insignificant long run relationship between real gross domestic product (RGDP) and domestic debt (DDET). Secondly, the regression analysis result revealed that external debt and debt servicing has a positive significant effect on economic growth in Nigeria. Real gross domestic product and external debt services exhibit the inelastic relationship. Based on the above findings, we recommend that Debts should be contracted solely for economic capital formation purposes since capital formation has direct impact on economic growth.

Sulaiman and Azeez (2012) examined the effect of external debt on the economic growth of Nigeria. The model built for the study proxy gross domestic product as the endogenous variable measuring economic growth as a function of external debt, ratio of external debt to export, inflation, and exchange rate proxy as the exogenous variables from 1970 to 2010. The econometric techniques of Ordinary Least Square (OLS) and Error Correction Method (ECM) are employed in the empirical analysis. The co-integration test shows that long-run equilibrium

relationship exist among the variables. The findings from the error correction method show that external debt has contributed positively to the Nigerian economy. The study recommends that government should ensure economic and political stability and external debt should be acquired largely for economic reasons rather than social or political reasons.

2.4 Gap identified

Most of the literature reviewed used gross domestic product to measured economic growth without considering the real terms of GDP in the study area except for Awol (2022), Edeminam (2021) and Orjinta and Nwadiolor (2016), furthermore, none of the previous study employed nonlinear ARDL model except Yusuf and Mohd (2023). In view of the above the current study used real gross domestic product to measured economic growth and employed nonlinear ARDL model in the analysis in order to measure the asymmetric effect of the debt servicing on economic growth in Nigeria.

3. Methodology

3.1 model specification

The model of the study is adopted from the work of Otiko et al (2022) and Akanbi at al (2022), is express as

$$GDP = F(FDS, DDS, EXD, CURRP) \tag{3.1}$$

The model is modified by using real gross domestic product and incorporating exchange rate due to its significant roles play in international economy.

$$RGDP = F(FDS, EXD, REXRATE) \tag{3.2}$$

Table 3.1 Measurement of Variable

Variable	Type of Variable	Expected sign	Measurement	Source
Real GDP	Dependent variable	positive (+)	Real gross domestic product (RGDP) is measured as GDP at constant price of 2015	World development indicators (WDI)
Foreign debt service	Independent variable	Negative (-)	Measured at current US dollar	World development indicators (WDI)
External debt	Independent variable	Negative (-)	Measure as total of external debt stock	World development indicators (WDI)
Real exchange rate	Independent variable	Negative (-)	Measured as official exchange rate.	World development indicators (WDI)

Source: Authors compilation (2023).

3.2 Non-linear Auto Regressive Distributed Lag (NARDL) Model

Non-linear Autoregressive Lagged (NARDL) Model recently developed by Shin et al. (2014) contains asymmetries relationships both in the short and long run. But, the model sees the asymmetries in the dynamic modification. Furthermore, the model is appropriate in a combined order of level and the first difference (Ibrahim, 2015). The asymmetries are repeatedly experienced in economic variables. In reality, asymmetry is a basis in the human condition since nonlinearity is globally witnessed in the social sciences (Shin et al., 2014).

$$\Delta y_t = \mu + \sum_{i=1}^{n-1} a_i \Delta y_{t-i_P} + \sum_{i=1}^{n-1} a_i \Delta y_{t-i_N} + \sum_{i=0}^{m-1} \gamma_i \Delta x_{t-i_P} + \sum_{i=0}^{m-1} \gamma_i \Delta x_{t-i_N} - \pi \hat{e}_{t-1} + \varepsilon_t \tag{3.3}$$

Where Δ is the difference operator, y_t is a vector of dependent variable, x_{t-i} is the matrix of lag values of independent variables and π is the adjustment effect or error correction coefficient which is assumed to be negative for the error to be corrected. Specifically, the ECM model to be tested is shown in equation while $_P$ and $_N$ portray the partial sum of positive and negative changes in the explanatory variables respectively.

$$\Delta RGDP_t = \mu + \sum_{i=1}^{n-1} a_i \Delta RGDP_{t-1} + \sum_{i=0}^{m-1} \beta_i \Delta FDS_{t-i_P} + \sum_{i=0}^{m-1} u_i \Delta FDS_{t-i_N} + \sum_{i=1}^{n-1} a_i \Delta EXD_{t-i_P} + \sum_{i=0}^{m-1} \gamma_i \Delta EXD_{t-i_N} + \sum_{i=0}^{m-1} \beta_i \Delta REXRATE_{t-i_P} + \sum_{i=0}^{m-1} u_i \Delta REXRATE_{t-i_N} - \pi \hat{e}_{t-1} + \varepsilon_t \tag{3.4}$$

4. Empirical Results and Discussion

Table 4.1 Descriptive statistics

Statistics	LRGDP	LEDS	LEXD	EXRATE
Mean	11.20403	9.365136	10.50561	112.9787
Median	11.21610	9.311913	10.51024	111.2313
Maximum	11.75905	9.954170	10.99271	425.9792
Minimum	10.64348	8.812647	9.951251	0.546781
Std. Dev.	0.372987	0.287416	0.222328	119.0566
Skewness	0.004011	0.441034	-0.017458	0.050324
Kurtosis	1.459363	2.463159	3.519004	3.278607
Jarque-Bera	4.252749	1.910350	0.484796	8.045202
Probability	0.119269	0.384745	0.784744	0.017906
Sum	481.7731	402.7009	451.7411	4858.084
Sum Sq. Dev.	5.843000	3.469536	2.076041	595327.5
Observations	43	43	43	43

Source: Researcher computation using E-views 10.

Table 4.1 presents the result of descriptive statistics of the study, it indicates that the standard deviations of the variables of used in the study are not far away from their means, this means that

there is a minimum chance to have an error in the study. The Skewness of the distribution in the table shows that real gross domestic product, external debt service, and exchange rate skewed to the right and less than one, while external debt skewed to the left, this implies that all the variables employed in the study are normally distributed. The Kurtosis shows that all the variables employed such as real gross domestic product, external debt servicing, external debt and exchange rate are normally distributed. The Jarque-Bera test for normality is also estimated. It shows that real gross domestic product, external debt servicing, and external debt are not normally distributed while exchange rate is normally distributed as its p-values is greater than 5%.

4.2 Zivot and Andrew Unit Root Test

The study used Zivot and Andrew unit root test in order to confirm the order of integration among the variables employed, because ignoring unit root test with break may lead the acceptance of null hypothesis where is supposed to be rejected.

Table 4.2 Zivot-Andrew Unit Root Test

Variables	Level		First difference	
	Statistics	Break point	Statistics	Break point
LRGDP	-3.880334	2010	-7.074353	1997
LEDS	-5.262694	2007	-	-
LEXD	-5.085685	2005	-6.430948	2005
EXRATE	-3.544289	2013	-5.939992	2015

Source: Researcher computation using E-views 10.

Table 4.2 presents the Zivot-Andrew unit root test indicates that real gross domestic product, interest rate, external debt and exchange rate are integrated of order one in other words are stationary at first difference i.e. they are I(1) process, the break dates are 1997, 2005 and 2015 respectively. The variable external debt servicing is integrated of order zero in other word it is stationary at level i.e. it is I(0) process, the break date is 2007.

4.3 NARDL Bound Test for Long run

The test is conducted in order to ensure the existence of long run association among the variables employed.

Table 4.3 Result of Cointegration Bounds test of NARDL

Statistics	Value		Critical bounds			
			1%	2.5%	5%	10%
F-statistics	4.694997					
		I(0) Bound	2.88	2.55	2.27	1.99
		I (1) Bound	3.99	3.61	3.28	2.94

Source: Researcher computation using E-views 10.

From table 4.3, the result of co-integration bound test indicates a higher value of F-statistics than any of the critical values of all bounds 4.69. Therefore, there is a strong evidence of long run nonlinear equilibrium relationship between dependent and independent variables in the model. Furthermore, this means that the null the hypothesis claiming no asymmetric Cointegration among the variables in the model is rejected. This indicates strong evidence for asymmetric cointegration among the variables employed.

4.4 Results of Nonlinear Autoregressive Distributed Lag (NARDL) model

As a result of unit root and bound tests conducted in the study which suggests the use of the ARDL model. The appropriate model (number of lags) is selected automatically using Akaike Information Criterion (AIC) which is seen as a more robust model. Below, both short-run and long-run parameters of the model are presented.

4.4.1. Short-run Relationship

Below the result of short-run parameters of the NARDL model is presented. AIC suggests a (4, 4, 4, 3, 3, 4, 3) model after testing for up to 62500 different models.

Table 4.4 Short run parameters of the NARDL Model and ECM result

Variables	Coefficient	Std error	t- statistics	Prob.
$\Delta(\text{LRGDP}(-1))$	0.184082	0.111558	1.650093	0.0500
$\Delta(\text{LRGDP}(-2))$	0.333810	0.127554	2.617004	0.0397
$\Delta(\text{LRGDP}(-3))$	0.378931	0.150234	2.522274	0.0451
$\Delta(\text{LEDS_POS})$	-0.048834	0.084526	-0.577733	0.5845
$\Delta(\text{LEDS_POS}(-1))$	-0.103041	0.098250	-1.048766	0.3347
$\Delta(\text{LEDS_POS}(-2))$	-0.726594	0.118499	-6.131644	0.0009
$\Delta(\text{LEDS_POS}(-3))$	-0.942630	0.126860	-7.430453	0.0003
$\Delta(\text{LEDS_NEG})$	-0.107947	0.101173	-1.066951	0.3270
$\Delta(\text{LEDS_NEG}(-1))$	0.702986	0.144037	4.880580	0.0028
$\Delta(\text{LEDS_NEG}(-2))$	0.996968	0.153293	6.503675	0.0006
$\Delta(\text{LEDS_NEG}(-3))$	0.486226	0.118457	4.104660	0.0063
$\Delta(\text{LEXD_POS})$	0.847614	0.279179	3.036096	0.0229
$\Delta(\text{LEXD_POS}(-1))$	0.701730	0.412245	4.127959	0.0062
$\Delta(\text{LEXD_POS}(-2))$	0.755823	0.218938	3.452222	0.0136
$\Delta(\text{LEXD_NEG})$	0.994558	0.394977	7.581607	0.0003
$\Delta(\text{LEXD_NEG}(-1))$	-0.369797	0.476128	-4.977228	0.0025
$\Delta(\text{LEXD_NEG}(-2))$	0.349258	0.603698	2.234988	0.0668
$\Delta(\text{EXRATE_POS})$	-0.006390	0.000603	-10.60467	0.0000
$\Delta(\text{EXRATE_POS}(-1))$	-0.000883	0.001191	-0.741195	0.4866

$\Delta(\text{EXRATE_POS}(-2))$	-0.006023	0.000948	-6.351967	0.0007
$\Delta(\text{EXRATE_POS}(-3))$	-0.003664	0.001288	-2.844140	0.0294
$\Delta(\text{EXRATE_NEG})$	-0.170276	0.026306	-6.472923	0.0006
$\Delta(\text{EXRATE_NEG}(-1))$	-0.074533	0.013809	-5.397273	0.0017
$\Delta(\text{EXRATE_NEG}(-2))$	-0.056695	0.012477	-4.543991	0.0039
R-squared				0.996406
Adjusted R-squared				0.977834
S.E. of regression				0.057382
Sum squared resid				0.019756
Log likelihood				89.75594
F-statistic				53.65345
Prob(F-statistic)				0.000033
Durbin-Watson stat				2.735121

Source: Researcher computation using E-views 10.

The result from table 4.4 presents the non-linear ARDL model, it indicates a positive autoregressive and statistically significant effect of the dependent variable (real gross domestic product) at all lag, this means that real gross domestic product is largely depends itself in the short run. The positive coefficient of external debt servicing shows negative and statistically insignificant effect on the real gross domestic product Nigeria in the short run, at lag 1, 2 and 3 indicates positive and statistically significant effect on the real gross domestic product. The negative coefficient of external debt servicing shows negative and statistically insignificant effect on the real gross domestic product Nigeria, at lag 1, 2 and 3 indicates positive and statistically significant effect on the real gross domestic product. The positive coefficient of external debt indicates positive and statistically significant effect on the real gross domestic product Nigeria, at lag 1 and 2 indicates positive and statistically significant effect on the real gross domestic product.

The negative coefficient of external debt shows positive and statistically significant effect on the real gross domestic product Nigeria, at lag 1 indicates negative while lag 2 shows positive effect on real growth domestic product. The positive coefficient of exchange rate indicates negative and statistically significant effect on the real gross domestic product Nigeria, at lag 1, 2 and 3 indicates negative and statistically significant effect on the real gross domestic product. The negative coefficient of exchange rate indicates negative and statistically significant effect on the real gross domestic product Nigeria, at lag 1, 2 and 3 indicates positive and statistically significant effect on the real gross domestic product.

The R-squared and its adjusted value are very high 0.996406, this implies that 99% change in the real gross domestic product is explained by external debt servicing, external debt and exchange rate in Nigeria. The p-value of f-statistics indicates (0.000000), this means that external debt servicing, external debt and exchange rate have 100% significance influence on the real gross domestic product.

4.4.2 Long-run and Error Correction Result

As a result of the NARDL bound test which confirms the existence of a long-run relationship among the variables of interest.

Table 4.5 NARDL Long run Form Results

Variables	Coefficient	Std error	t- statistics	Prob.
LEDS_POS	0.419171	8.265857	0.413650	0.0035
LEDS_NEG	-0.932014	44.98206	-0.220799	0.0326
LEXD_POS	-0.749814	71.02330	-0.246372	0.0136
LEXD_NEG	0.119800	147.2951	0.211806	0.0393
EXRATE_POS	0.001570	0.029936	0.052433	0.0599
EXRATE_NEG	-0.020014	0.523009	-0.038267	0.0407
ECM	-0.118451	0.013130	-9.021084	0.0001

Source: researcher computation using E-views 10.

Table 4.5 present the nonlinear auto regressive distributed lag model results, the positive coefficient of external debt servicing shows positive and statistically significant effect on the real gross domestic product Nigeria in the long run and the negative coefficient shows negative and statistically significant effect on the real gross domestic product in Nigeria. by implication if external debt service raises up by single digit the real gross domestic product will increase by 41% in the long run all thing being equal. The positive finding is contrary with the appriari expectation which establish a negative relationship between external debt servicing and economic growth in Nigeria, an increase in external debt services will reduce economic growth all things being equal. The positive coefficient of external debt shows negative and statistically significant effect on the real gross domestic product Nigeria while the negative coefficient of external debt shows positive and statistically significant effect on the real gross domestic product Nigeria, by implication if external debt increases by single digit the real gross domestic product will decrease by 74% in the long run all thing being equal. The positive coefficient of exchange rate indicates positive and statistically significant effect on the real gross domestic product in Nigeria; this means that when exchange increases by N1 the real gross domestic product in Nigeria will increase by less than 1%, the negative coefficient of exchange rate indicates negative and statistically significant effect on the real gross domestic product in Nigeria. The error correction term meets all its condition, that is negative, less than one and statistically significant, if there is any disequilibrium in the system, it takes an average of 11% of this NARDL model to adjust back from short run to long run.

4.4.3 Wald Test

An asymmetry test investigates whether the coefficients are equal or not. If they are not identical, there is evidence of asymmetry; otherwise, it would not be. To test the long run asymmetry in using Wald test.

Table 4.6 NARDL Wald test

Test Statistic	Value	Df	Probability
F-statistic	115.3017	(1, 19)	0.0000
Chi-square	115.3017	1	0.0000

Source: researcher computation using E-views 10.

Table 4.6 indicates that the null hypothesis of symmetry is rejected because the p-value is less than 5%. The result of the Wald test reveals an asymmetry impact exist in the long-run of debt servicing in the Nigerian economy. It means that positive and negative changes of debt servicing are not equal i.e are asymmetric. It is shown that the growth rate is more influenced by positive change than the negative change in economic growth.

4.4.4 Post estimation tests

Table 4.7 Post estimation tests

Tests	P-value
Serial correlation	0.2414
Heteroscedastics	0.2867
Normality	0.0937
Ramsey test	0.8445

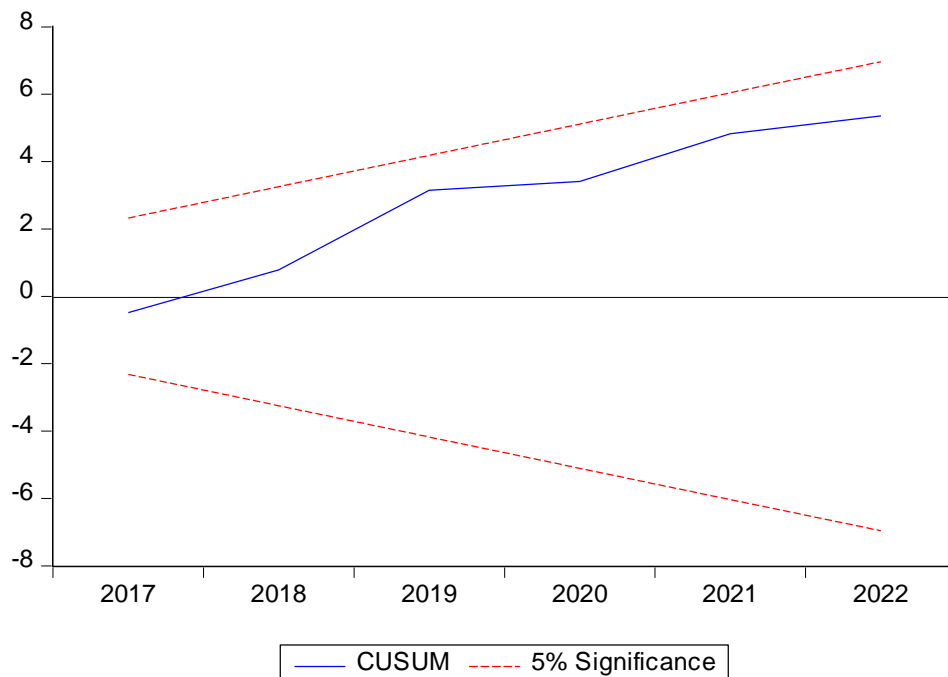
Source: Researcher computation using E-views 10.

The nonlinear ARDL model estimated passed the post estimation tests such as serial correlation, Heteroscedasticity, normality and Ramsey test because their probability values are greater than 5%.

4.4.5 Structural Stability test

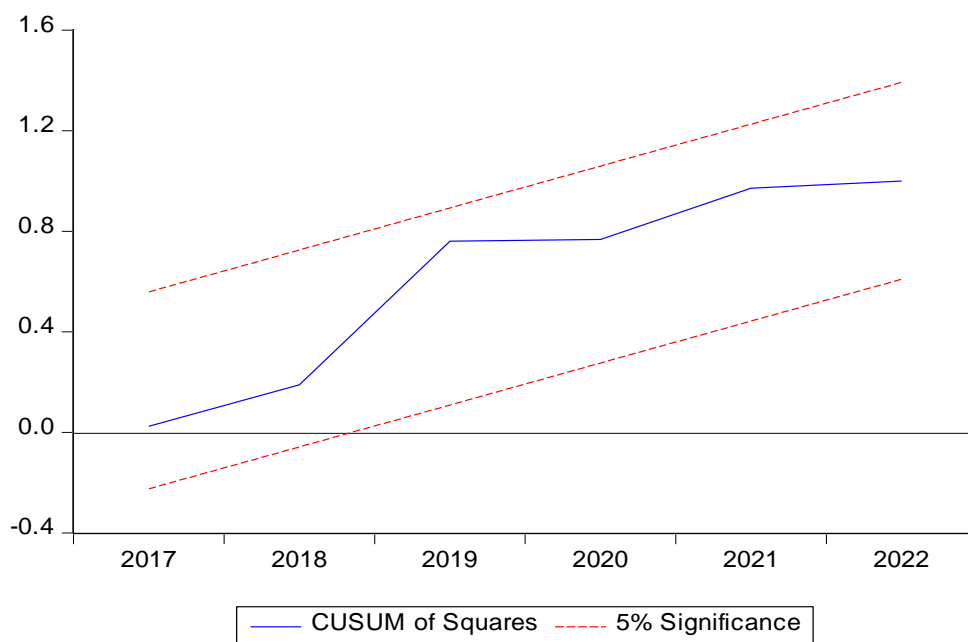
To check the structural stability test, recursive estimation has been applied. There are two types of tests in recursive estimation. The Cumulative Sum and Cumulative Sum of squares test are used to detect the structural stability of the nonlinear ARDL model.

Figure 4.1 Cusum Plot Recursive Residual of ARDL Model



Source: Researcher computation using E-views 10.

Figure 4.2 Cusum Square Plot Recursive Residual of ARDL Model



Source: Researcher computation using E-views 10.

The decision rule is that we cannot reject the null hypothesis if the Cumulative Sum (CUSUM) and Cumulative Sum of squares test line lies between two critical lines at a 5% significance level. Otherwise, the null hypothesis would be accepted. In this case the current study cannot reject the null hypothesis, which implies that the NARDL model is structurally stable over study time.

4.4.6 Discussion of the result

The results of nonlinear ARDL model shows that external debt servicing has a positive and statistically significant effect on the real gross domestic product Nigeria, by implication if external debt service raises up by single digit the real gross domestic product will increase by 41% all thing being equal. The positive finding is contrary with the appriri expectation which establish a negative relationship between external debt servicing and economic growth in Nigeria, an increase in external debt services will reduce economic growth all things being equal. furthermore, the positive finding in line with the finding of Ndu (2024), Yusuf et al (2023), Awol (2022) and Olusegun, Oladipo et al (2021) while countered with the finding of Akanbi, Uwaleke et al (2022) and Muhammad and Abdullahi (2020). The result also shows that external debt has a negative and statistically significant effect on the real gross domestic product Nigeria, by implication if external debt increases by single digit the real gross domestic product will decrease by 74% in the long run all thing being equal. The negative finding countered with the finding of Idris and Aliyara (2022). Exchange rate indicates positive and statistically significant effect on the real gross domestic product in Nigeria; this means that when exchange increases by N1 the real gross domestic product in Nigeria will increase by less than 1%.

5. Conclusions and Recommendations

The study investigates the effect of debt servicing on economic growth in Nigeria using annual data from 1980 to 2022. The Zivot-Andrew unit root test indicates that real gross domestic product, interest rate, external debt and exchange rate are integrated of order one while external debt servicing is integrated of order zero. The results of nonlinear ARDL model show that external debt servicing has a positive and statistically significant effect on the real gross domestic product Nigeria. External debt has a negative and statistically significant effect on the real gross domestic product Nigeria. Exchange rate indicates positive and statistically significant effect on the real gross domestic product in Nigeria. Therefore, the current study concludes that there exists an asymmetry impact in the long-run of debt servicing in the Nigerian economy. The study recommends that Nigerian debt be it internal or external should be utilize judiciously and investment should be made so that the economic growth could be achieved.

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