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The Relationship Between Exchange Rate Fluctuations and Debt Recovery Efforts in Nigeria

Patimi Ebikeiseye[1], Pullah Ebipre[2]
Department of Economics, Faculty of Social Sciences, Isaac Jasper Boro College of Education Sagbama Bayelsa State Nigeria
Corresponding Author: Pullah Ebipre pullahebipre@gmail.com

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A B S T R A C T

The study examined the relationship between exchange rate fluctuations and debt recovery efforts in Nigeria. Adopting the debt overhang theory, debt servicing (DSVt) was specified as a function of exchange rate (EXRt), government revenue (GRVt), government capital expenditure (GCEt), and inflation rate (INFt), while interest rate (INTt) was chosen as a control variable. Data of the variables were obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin. Following unit root and cointegration tests, the autoregressive distribution lag (ARDL) model was estimated to determine the long-run equilibrium relationship and short-run parameters. The results revealed a significant positive relationship between the exchange rate and debt servicing and implied that as the exchange rate increases, the cost of servicing external debt also rises in Nigeria. Moreover, in the short run, the study identified oscillating convergence. This suggested that debt servicing dynamics adjust toward equilibrium over time, though not in a smooth manner. Oscillating convergence implies that there are short-term fluctuations before reaching a stable long-term equilibrium. The study concluded that external debt management in Nigeria is significantly influenced by exchange rate fluctuations, fiscal policies, and inflation dynamics. Among others, the study recommended that the government prioritize fiscal discipline, ensuring that public spending is aligned with long-term economic growth and debt sustainability in Nigeria.

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1. INTRODUCTION

The interplay between exchange rate fluctuations and debt servicing is a critical issue for developing economies, particularly for countries like Nigeria, which has been heavily reliant on borrowing to finance its development needs. Nigeria's debt has grown significantly over the years, contributing to mounting debt servicing challenges, especially as exchange rate volatility impacts the cost of repaying these debts (Ogunleye & Adediran, 2022). Exchange rate fluctuations can affect the value of debt obligations, which are often denominated in foreign currencies, thus influencing a country's ability to meet its debt servicing requirements. The Nigerian economy, which is largely dependent on oil exports, is particularly vulnerable to exchange rate fluctuations due to the correlation between oil prices and the value of the naira. When oil prices decline, the naira depreciates, leading to an increase in the cost of servicing debt. Conversely, if the naira appreciates, the cost of debt servicing could decrease, easing the fiscal burden on the government (Olofin, 2021). The Central Bank of Nigeria (CBN) has attempted to manage exchange rate volatility through various monetary policies, but persistent instability in global oil prices and domestic factors such as inflation and political instability continue to challenge these efforts.

The depreciation of the naira has been particularly significant, as it results in a higher local currency requirement to meet foreign currency obligations, thus exacerbating the debt burden (Ajayi & Akinlo, 2023). In contrast, an appreciation of the naira might reduce the local currency cost of external debt, potentially offering fiscal relief. However, the relationship between exchange rates and debt servicing is not always straightforward, as other factors, such as foreign exchange reserves, inflation, and fiscal policy, also influence this dynamic (Okunola & Asogwa, 2020). Understanding how exchange rate dynamics affect Nigeria's ability to service external debt is crucial for formulating appropriate economic and fiscal policies. It also provides insights into the long-term sustainability of the country's debt management strategy. Despite the significance of this issue, there is limited empirical research that specifically examines how changes in exchange rates influence Nigeria's debt servicing and the role of the naira's depreciation or appreciation in these processes. This study, therefore, seeks to explore the intricate relationship between exchange rates and debt servicing in Nigeria, focusing on the implications for fiscal stability and debt recovery efforts.

Statement of the Problem

Nigeria's exchange rate has experienced significant fluctuations over the past two decades, exacerbated by factors such as oil price volatility, inflationary pressures, and foreign exchange controls (Akinola & Olayemi, 2021). These fluctuations create a situation where Nigeria's capacity to meet its foreign debt obligations is highly sensitive to exchange rate volatility. A sharp depreciation of the naira, for example, increases the local currency cost of foreign debt, leading to a strain on the national budget and potentially diverting funds from vital public investments (Ogundipe & Akinmoladun, 2022). On the other hand, the appreciation of the naira could lower debt servicing costs, but such periods of stability tend to be brief and highly dependent on external factors like global oil prices (Ajayi, 2020).

The challenge becomes even more complex when considering Nigeria's debt recovery efforts. Despite efforts by the government to address the debt burden, exchange rate volatility continues to undermine these recovery strategies. In light of this, the country's ability to service its external debt efficiently and sustainably remains uncertain. As the country strives to achieve macroeconomic stability and growth, understanding the interplay between exchange rate fluctuations and debt recovery efforts is crucial for developing more effective fiscal and monetary policies. Despite the importance of this issue, there is limited empirical research that explores how exchange rate movements directly impact Nigeria's external debt recovery and servicing efforts. Most studies tend to focus on broader aspects of exchange rate volatility or external debt management separately, without analyzing the specific relationship between the two. This gap in the literature necessitates a focused study to examine how changes in the exchange rate influence Nigeria's ability to service its debt and the implications of naira depreciation or appreciation for the debt recovery process. Addressing this gap is essential for formulating policy recommendations that could enhance Nigeria's debt sustainability.

Objectives of the Study

The main objective of this study is to examine the relationship between exchange rate fluctuations and debt recovery efforts in Nigeria. Specifically, the study aims to:

1. Assess the impact of exchange rate fluctuations on debt servicing in Nigeria
2. Examine the effect of government revenue and debt servicing in Nigeria
3. Examine the relationship between government expenditure and debt servicing in Nigeria

2. LITERATURE REVIEW

This section highlighted the state of knowledge in the field of study by providing conceptual clarification, theoretical review, and empirical review.

Conceptual Clarification

A brief discussion on the key concept in the study is essential to pave the way for a proper understanding of the relationship between exchange rate fluctuations and debt servicing in Nigeria.

Exchange Rate: The exchange rate refers to the value of Nigeria's currency, the Naira, in relation to other global currencies, such as the US dollar, euro, or British pound. Exchange rate fluctuations, particularly depreciation, can significantly affect the costs of external debt servicing. A depreciated naira increases the local currency amount required to service foreign-denominated debt, which may strain the national budget and reduce the capacity to finance other developmental projects (Aluko & Adeoye, 2020). Exchange rates are influenced by a variety of factors, including global oil prices, market sentiment, and fiscal and monetary policies within Nigeria. Given that much of Nigeria's external debt is denominated in foreign currencies, exchange rate volatility is a critical determinant of debt sustainability.

Debt Servicing: Debt servicing encompasses the payment of both interest and principal on loans, and in the case of Nigeria, it involves both domestic and foreign debts. The country's reliance on external debt denominated in foreign currencies makes debt servicing particularly vulnerable to exchange rate movements. When the naira depreciates, the cost of servicing external debt rises in terms of the local currency, thereby increasing the fiscal burden on the government. As highlighted by Oladipo (2019), a weak exchange rate translates into higher debt servicing costs, which in turn diverts government resources away from critical public services and infrastructure investment, thereby constraining overall economic growth.

Government Revenue: Government revenue in Nigeria is primarily generated from oil exports and taxation. The exchange rate affects government revenue in two key ways. Firstly, a weaker naira may increase the value of oil revenues when converted into foreign currencies, boosting the government's foreign exchange earnings. However, this effect can be counterbalanced by the increased costs of servicing foreign debt, which reduces the net gain from stronger oil exports (Akinlo, 2020). Secondly, the inflationary pressures created by exchange rate depreciation may reduce the purchasing power of the naira, thereby limiting domestic tax revenues. The combination of these effects creates a complex relationship between exchange rates and government revenue, making it essential for the government to adopt effective fiscal and monetary strategies to stabilize the exchange rate.

Government Debt: Nigeria's government debt consists of both domestic and external debt. While domestic debt is issued in local currency, external debt is generally denominated in foreign currencies, exposing Nigeria to the risks associated with exchange rate volatility. The higher the proportion of external debt, the more vulnerable the government becomes to currency depreciation, which directly impacts its ability to meet debt obligations (Olawale & Abdul-Rahman, 2019). Rising external debt burdens can lead to increased borrowing costs if investors perceive that the government is facing fiscal difficulties due to exchange rate depreciation.

Inflation: Inflation refers to the general increase in the prices of goods and services within an economy. In Nigeria, exchange rate depreciation often leads to higher import costs, particularly for fuel and food, thereby contributing to inflationary pressures (Onakoya, 2019). Inflation, in turn, erodes the real value of government revenue, as well as the purchasing power of citizens. The impact of inflation on debt servicing is twofold: it increases the cost of domestic debt servicing due to rising interest rates, and it may also diminish the government's ability to collect real tax revenue, making it more difficult to meet debt obligations.

Theoretical Review

The relationship between exchange rate fluctuations and external debt servicing is deeply embedded in various economic theories, which provide a framework for understanding the dynamics of currency depreciation, external borrowing, and debt repayment. Several theories can help explain the interplay between exchange rate volatility and external debt recovery efforts in Nigeria.

The Mundell-Fleming Model

The Mundell-Fleming model, which is an extension of the IS-LM model in an open economy, focuses on the interactions between exchange rates, fiscal policy, and monetary policy. According to this model, exchange rate fluctuations are a key factor influencing a country's ability to meet its external debt obligations. The model suggests that in a small, open economy like Nigeria, depreciation of the domestic currency increases the cost of foreign debt servicing, which can lead to a deterioration in the country's fiscal position (Mundell, 1963). A depreciated naira, for example, would raise the local currency amount needed to meet foreign-denominated debt repayments, thereby affecting Nigeria's debt sustainability and recovery efforts (Ogunleye & Adediran, 2023).

The Debt Overhang Theory

The debt overhang theory, first proposed by Krugman (1988), suggests that a country with a large stock of external debt may be less able to invest in future growth because the expectation of future debt payments limits the government's ability to use resources for productive investment. For Nigeria, fluctuations in the exchange rate can exacerbate the debt overhang problem. Depreciation of the naira increases the local currency value of foreign debt, thereby deepening the debt burden and reducing the capacity to invest in development projects. The result is a vicious cycle where exchange rate volatility hampers debt recovery efforts, which in turn stifles economic growth and increases reliance on foreign borrowing (Ajayi, 2020).

The Sovereign Debt Theory

The sovereign debt theory emphasizes the risks associated with external borrowing, particularly when countries face volatility in exchange rates. This theory posits that exchange rate volatility can lead to higher risk premiums on foreign loans, increasing the cost of borrowing for governments. In the context of Nigeria, the instability of the naira and its frequent depreciation can make it more expensive for the government to secure new financing, thereby exacerbating the challenges of managing and servicing external debt (Ogundipe & Akinmoladun, 2022). The unpredictability of exchange rate movements also complicates debt restructuring and recovery efforts, as the government may be faced with higher repayment amounts due to unfavorable currency fluctuations.

The Ricardian Equivalence Theory

The Ricardian equivalence theory, proposed by Barro (1974), suggests that government debt does not affect a country's overall economic activity because rational consumers anticipate that future tax increases will be used to repay the debt. While this theory is often criticized, it offers insight into the relationship between exchange rate fluctuations and external debt recovery. In Nigeria, the theory implies that even though exchange rate movements affect the government's debt obligations in the short term, long-term sustainability depends on the country's fiscal policies. Effective management of fiscal policy, including exchange rate stabilization, is critical for ensuring that external debt

servicing does not undermine future economic growth and stability (Ogunleye & Adediran, 2023).

Empirical Review

Binuyo et al. (2023) examined the relationship between foreign direct investment (FDI), exchange rates, and GDP in Nigeria from 1981 to 2021. The results showed a significant long-term relationship between GDP and exchange rates, with fluctuations in exchange rates significantly impacting economic growth. However, the relationship between GDP and foreign direct investment was insignificant in both short and long run. Inflation rates also negatively affected GDP. The study suggested that exchange rate management is crucial for enhancing Nigeria's GDP, and policymakers should implement stringent controls on foreign exchange policies to stabilize the Naira's value and improve economic conditions. The study concluded that effective policy implementation and management of economic variables are essential for sustainable growth in Nigeria.

Ashakah et al. (2025) conducted a study on the relationship between external debt, debt service, and economic growth in the ECOWAS sub-region from 1990 to 2022. The researchers used panel data from fifteen ECOWAS nations and used fixed and random effects models to analyze the relationships among key variables. The results showed a significant negative impact of external debt on economic growth, with a unit increase in external debt correlated with a decline in economic growth rate. The authors recommend that governments in the region prioritize reducing external debt and implementing strategies to allocate revenues from debts towards productive expenditures. The study also advocated for a reassessment of external debt policies among ECOWAS nations to enhance economic growth rates, foster job creation, and contribute to poverty reduction efforts.

Lubis, Rasyid, and Siregar (2024) examined the relationship between Indonesia's foreign debt and economic indicators such as exports, imports, inflation, exchange rates, and foreign exchange reserves. The researchers used a quantitative methodology and a Vector Autoregression (VAR) approach to analyze 96 observations from 2015 to 2022. They found no two-way causality between economic variables and Indonesia's external debt, but a cointegration relationship was identified. An increase in exports and a decrease in imports could lead to a short-term reduction in foreign debt, while inflation affected the real value of debt. Exchange rates and foreign exchange reserves did not show direct causality to foreign debt, but their long-term negative interaction influenced external debt levels. The study suggested Indonesian policymakers should focus on enhancing export revenues and managing imports to mitigate foreign debt levels.

Okonkwo and Akamike (2024) study examined the relationship between public debt and monetary stability in Nigeria. They analyzed the impact of debt servicing on the economy, evaluated the Central Bank of Nigeria's role in maintaining monetary stability, identified challenges and risks, and proposed policy recommendations for effective debt management. The study found that

high public debt levels strained fiscal resources, exacerbated inflationary pressures, and increased exchange rate volatility. Public debt also influenced interest rates, reducing investor confidence and raising borrowing costs. External factors like oil price fluctuations and global financial conditions significantly impacted Nigeria's economic stability. The study suggested the need for enhanced budgetary controls, improved tax administration, and economic diversification to ensure long-term fiscal sustainability. The study emphasized the CBN's role in aligning monetary policies with effective debt management to foster economic growth while controlling inflation.

Es-Sounboula and Doukkali (2020) study examined the impact of the Moroccan Dirham's exchange rate on public debt from 1998 to 2018. They used a methodological approach, including Vector Autoregression and causality techniques, to analyze the relationship between the real exchange rate and public treasury debt. The study found a significant relationship between exchange rate fluctuations and interest expenses on debt, and also positively influenced the ordinary budget balance. However, there were no immediate causal relationships between exchange rate changes and public debt levels. The study's findings have implications for Morocco's economic policy, particularly regarding exchange rate management and public debt strategies. The authors recommend caution about exchange rate volatility and emphasized the need for structural reforms to stabilize the economy and consolidate budgetary policies.

The study by Nurfiyanti et al. (2025) examined the impact of foreign debt, liquidity, company size, exchange rates, and leverage on hedging decisions in Indonesian energy sector companies. The research, which used a quantitative methodology and data from 124 companies, found that foreign debt and exchange rates did not significantly influence hedging decisions. However, companies with higher liquidity and larger sizes were more likely to adopt hedging strategies, while those with greater leverage faced increased risks that could be mitigated through hedging practices. The study suggested that company managers should prioritize internal factors to reduce foreign exchange risks.

Kolawole (2024) explored the relationship between external debt and economic growth in Nigeria from 1981 to 2021. The research used the Auto-Regressive Distributed Lag (ARDL) econometric technique to analyze the growth rate of real GDP, with external debt, openness to foreign trade, real interest rate, real exchange rate, and domestic investment as independent variables. The findings revealed a complex relationship, with external debt negatively impacting economic growth, while openness to trade and domestic investment positively influenced it. The study suggested that reliance on external borrowing may hinder access to international financing and recommends policymakers optimize borrowing use, focus on growth-enhancing investments, and explore alternatives to mitigate the adverse effects of high debt levels.

Abdulhamid et al (2024) study examined the impact of exchange rate shocks on Nigeria's economic growth using a novel Bootstrap Autoregressive Distributed Lag (BARDL) model. The study found a significant long-run cointegration relationship between exchange rates and economic growth,

highlighting the critical role of exchange rate fluctuations in Nigeria's economic performance. In the short run, the analysis showed an inverted U-shaped effect, with initial positive impacts of shocks turning negative over time. Exchange rate depreciation hindered short-term economic growth but could enhance Nigeria's competitiveness in external trade. The study concluded that exchange rate significantly influences Nigeria's economic growth, emphasizing the need for careful management of exchange rate policies to prevent destabilization.

Zeb et el (2024) examined the impact of exchange rate volatility, fiscal imbalance, and money supply on inflation in Pakistan. The researchers used a Nonlinear Autoregressive Distributed Lag (NARDL) model to analyze data from 1991 to 2022. The findings showed that positive money supply shocks significantly influenced long-term inflation, while negative shocks primarily affected short-term inflation dynamics. Fiscal deficits slightly intensified short-term inflation, while fiscal reductions alleviated long-term inflation pressures. Both positive and negative shocks from exchange rate volatility adversely affected short-term inflation, with negative shocks having persistent long-term effects. The study also revealed a bidirectional causality between inflation and economic growth, with public spending having a unidirectional influence.

Mieno and Demachi (2024) examined the Lao economy's challenges, focusing on external debt and the development of the domestic financial system. They found that external debt was under control in the short term, but real sector growth showed resilience. The underdeveloped financial system had not reached its full potential for fiscal financing. The Lao economy did not exhibit typical "Dutch disease" symptoms, but growth was achieved through enhanced manufacturing capabilities. The study emphasized the need for policy reforms to strengthen the domestic financial system and reduce dependence on foreign capital. Improving governance and operational efficiency in public investments is crucial for managing external debt. Mieno and Demachi suggested enhancing infrastructure and financial sectors to meet domestic and external demands, with strengthening the banking sector and developing a functioning bond market for long-term debt sustainability.

Arsh et al (2024) examined the impact of debt servicing and macroeconomic factors on Pakistan's external debt from 1990 to 2020. The researchers used data from the World Development Indicators and the Pakistan Economic Survey to analyze short-term and long-term dynamics. They found a negative long-term relationship between debt servicing and external debt, suggesting higher debt repayments could reduce total external debt. However, fiscal deficit, exchange rate, and globalization showed significant positive correlations with external debt. A 1% increase in debt servicing led to a 0.07% decrease in external debt, while a 1% increase in the exchange rate led to a 1.96% increase. The study underscored the need for prudent debt management strategies to support productive investments and prioritize measures to reduce fiscal deficits. Effective management of debt servicing and economic policies is crucial for maintaining external debt sustainability.

Okonkwo (2024) examined Nigeria's public debt structure, composition, and sustainability. It analyzed historical debt patterns, domestic and external

debt, maturity profiles, currency composition, and macroeconomic factors. The findings revealed significant transformations since independence, with increased total debt stock and a high proportion of domestic debt. Challenges included elevated debt levels, high debt service-to-revenue ratios, and external debt vulnerabilities. The study highlighted the need for enhanced institutional capacity, risk management frameworks, and effective coordination of fiscal and monetary policies. Improved debt management practices are crucial for Nigeria's economic growth and stability, leading to enhanced fiscal discipline, increased investor confidence, and better public service financing. The study could serves as a guide for other developing countries facing similar debt management issues.

Ele and Ocheni (2024) examined the impact of foreign loans on Nigeria's economic development from 2010 to 2020. They found no significant relationship between foreign loan stock and GDP, with only 1.9% of GDP variations explained by foreign loans. The study suggests that conventional reliance on foreign loans for economic improvement is misguided, as accumulating foreign debt can lead to adverse economic conditions like loan overhang. The study called for Nigeria to reevaluate its borrowing strategies and focus on sustainable economic policies, shifting towards more purposeful borrowing, investment in indigenous industries, and the revival of abandoned industrial sectors.

Ndugbu, et al (2024) examined the relationship between domestic debt and exchange rate stability in Nigeria from 1980 to 2021. The researchers used a longitudinal, cross-sectional time series design and statistical techniques like Johansen cointegration and Granger causality tests. The results showed no long-term relationship between domestic debt and exchange rate stability. However, treasury bills and bonds had a significant positive effect on exchange rate stability in the short run, while FGNB showed a positive but insignificant effect. The study also found no Granger causation at the 5% significance level. The findings suggest a need for focused short-term strategies to enhance exchange rate stability and the strategic utilization of domestic debt instruments.

Uji (2023) examined the impact of external debt stocks and exchange rate fluctuations on Nigeria's economic growth. The research, based on data from 1981 to 2021, found that external debt stock and debt service significantly impacted economic growth. Exchange rate fluctuations, on the other hand, had a positive effect. The study suggested that mismanagement of borrowed funds exacerbated these effects. The findings highlighted the need for prudent financial policies and advised governments to focus on borrowing for well-planned capital projects rather than funding recurrent expenditures with external debt. The study concluded that external debt stock was detrimental to Nigeria's economic growth, primarily due to its role in creating instability through exchange rate fluctuations.

Akinola and Ohonba (2023) study on Nigeria's economic growth found that foreign direct investment (FDI), external debt servicing, and external debt significantly impacted the country's economy. The study used quantitative methods, including descriptive statistics, an autoregressive distributed lag (ARDL) model, and Granger causality tests, to analyze data from 1981 to 2022. The results showed that FDI declined from 2011 to 2022, while external debt

servicing increased significantly. The study also highlighted the importance of prudent external debt management to prevent excessive debt from affecting private investment and FDI. The study recommends prioritizing initiatives to attract and maintain FDI to enhance Nigeria's economic performance.

Fineboy et al (2024) examined the impact of various types of external debt on Nigeria's GDP. The researchers used an ex-post facto research design and Ordinary Least Squares (OLS) multiple regression to analyze data from secondary sources. The findings showed that all debt categories significantly impacted Nigeria's GDP. Proper allocation and management of these debts could enhance their positive impact on the economy. The study emphasized the need for the Nigerian government to channel external debt towards productive sectors for growth. Prudent debt management strategies, such as selecting loans with the lowest interest rates, were also emphasized. Understanding the nature and structure of external debts could help develop informed financial policies for sustainable economic development.

Ekuma et al (2024) examined the impact of increasing government debt on Nigeria's economic prosperity. It found that domestic debt positively impacted GDP, while external debt had a negative effect. The cost of borrowing also had a positive but non-significant effect on GDP. The study found that 98% of GDP variations could be explained by changes in these debt factors. The findings suggested that domestic borrowing is beneficial for Nigeria's economic growth, but external borrowing should be minimized due to its adverse effects. The research emphasized the importance of responsibly allocating resources obtained through borrowing to ensure economic prosperity. The study concluded by highlighting the significance of domestic debt in promoting economic growth, cautioning against reliance on external debt, and advocating for improved management of borrowed funds to maximize their effectiveness in fostering economic development.

Achilike, et al (2024) examined the impact of crude oil price volatility on Nigeria's exchange rates and employment generation in local government areas. The study found that oil price volatility significantly impacted the exchange rate and employment levels in Enugu State. The researchers emphasized the need for policies to reduce oil dependency and promote economic diversification to stabilize job creation and economic growth. They urged policymakers to develop strategies to mitigate the adverse effects of oil price volatility and explore alternative revenue sources.

Oluwadare et al. (2024) examined the impact of external debt on Nigeria's economic development, analyzing its effects on GDP, HDI, and Misery Index. The research used secondary data from the Central Bank of Nigeria Annual Bulletin from 2001 to 2022. The findings showed that external debt had mixed effects on Nigeria's economy, with poor management leading to negative economic stability. The study also highlighted the need for robust debt management strategies to effectively utilize external debt for economic development. Inadequate management practices undermined the potential of external debt, highlighting the need for enhanced accountability and comprehensive debt management strategies by the Nigerian government.

Ewubare and Ushie's 2022 study on Nigeria's economic growth from 1981 to 2020 found mixed results among variables. Inflation was stationary at levels, while exchange rates and interest rates were stationary at first differences. The bounds cointegration test revealed a significant long-run relationship between GDP growth and the independent variables. Exchange rate fluctuations negatively impacted GDP growth in both the short and long run, while inflation consistently harmed it. Interest rates positively influenced GDP growth, suggesting that higher interest rates could stimulate economic activity. The study underscored the need for stable exchange rate policies to mitigate the negative effects of exchange rate volatility and inflation on GDP growth. The Central Bank of Nigeria should implement consistent exchange rate policies to strengthen economic resilience and growth.

Ramadhan and Arifandi (2024) study examined the relationship between the rupiah exchange rate against the US dollar and Indonesia's export and import volumes. They found a positive correlation between the rupiah's exchange rate and the total value of exports and imports, with coefficients of 0.4344 and 0.3602, respectively. The depreciation of the rupiah was attributed to global factors such as rising Federal Reserve interest rates, geopolitical instability in Ukraine and the Middle East, and strong US economic performance. Despite the decline, Indonesia's foreign exchange reserves remained stable, but inflationary pressures were predicted. The study suggested that policymakers should consider the global economic landscape when addressing currency fluctuations, enhancing export competitiveness during currency depreciation and implementing effective monetary and fiscal synchronization to mitigate negative impacts on inflation and economic growth.

Chizuru and Longinus (2024) found a significant positive relationship between Nigeria's export structure and economic growth from 1990 to 2023. They analyzed the impact of various export components, including oil export, non-oil export, oil terms of trade, non-oil terms of trade, and exchange rate, on Nigeria's Real Gross Domestic Product (RGDP). The findings showed that oil export, non-oil export, and oil terms of trade positively influenced RGDP, while non-oil terms of trade and exchange rates negatively affected economic growth. The study suggested that Nigeria needs to enhance its oil exports and implement policies to diversify its export base to sustain economic growth. The study also emphasized the need for government initiatives to support the growth and stability of the underperforming non-oil sector, which heavily relies on oil exports.

Research Design

The research design for the study is quai-experimental design. This design was choosen because it allows for the collection of measurable data and the use of statistical techniques to investigate the link between exchange rate variations and trade performance. Secondary data of relevant variables were sourced from the Central Bank of Nigeria Statistical Bulletin.

Theoretical Framework

The debt overhang theory, first proposed by Krugman (1988) is used as the intellectual foundation of the study. The theory suggested that a country with a large stock of debt may be less able to invest in future growth because the expectation of future debt payments limits the government's ability to use resources for productive investment. More so, fluctuations in the exchange rate can exacerbate the debt overhang problem. The depreciation of the naira increases the local currency value of foreign debt, exacerbating the debt burden and decreasing the capacity for investment in development projects. Consequently, this creates a vicious cycle where exchange rate volatility impedes debt recovery efforts, which subsequently constrains economic growth and heightens dependence on foreign borrowing.

Variables of the Study

The analysis of the study is based on the following variables: debt servicing, exchange rate, government revenue and government capital expenditure.

Model Specification

DSVt = (EXRt, GRVt, GCEt, INFt,)
Where
DSVt is servicing
EXRt exchange rate
GRVt is government revenue
GEXt is government expenditure.
INFt is inflation rate
Explicitly the mathematical model becomes is;
$DSVt = \lambda 0 + \lambda 1EXRt + \lambda 2GRVt + \lambda 3GCEt + \lambda 4INFt$
Econometrics model is;
$DSVt = \lambda 0 + \lambda 1EXRt + \lambda 2GRVt + \lambda 3GCEt + \lambda 4INFt + \lambda 5\ INTt + Ut$
In the equation above, DSVt is specified as a function of exchange rate (EXRt), government revenue (GRVt), government capital expenditure (GCEt) and inflation rate (INFt). Interest rate (INTt) choosen is as the control variable, while Ut is the error term.

A Priori Expectation

The debt overhang theory theorizes that countries with large stock of debt may be less able to invest in future growth because the expectation of future debt payments limits the government's ability to use resources for productive investment. More so, fluctuations in the exchange rate can exacerbate the debt overhang problem. Furthermore, the depreciation of a local currency increases the value of foreign debt, exacerbating the debt burden and decreasing the capacity for investment in development projects. Therefore, ($\lambda 1 > 0$), ($\lambda 2 < 0$), ($\lambda 3 < 0$), ($\lambda 4 > 0$).

3. METHODOLOGY

Pre analysis econometrics tests; are conducted and following the results of the tests unit root and cointegration tests were conducted and autoregressive distributed lag (ARDL) model is used for the estimation.

4. RESEARCH RESULT

4.1 Model Estimation

Pre analysis econometrics tests; are conducted and following the results of the tests unit root and cointegration tests were conducted and autoregressive distributed lag (ARDL) model is used for the estimation. The time series property of the variables; debt servicing (DSV) exchange rate (EXR), government revenue (GRV), government expenditure (GEX) and inflation (INF) are determined using unit root, autoregressive distributed lag (ARDL) model bound test of cointegration was used for cointegration test.

4.1.1 Unit Root Test

Phillip Perron unit root test unit is carried out on each of the variables to ascertain the stationarity and order of integration of the variables to determine the choice of appropriate cointegration test.

Table 4. 1 Phillip Perron Unit Root Test

Variable	Test Equation	Level		First Difference		Order	
		Stat	P	Stat	PV		
DSV	I	-3.2222	0.0288			I(0)	
	I & T	-6.6297	0.0000				
	N	-1.1959	0.2065	-14.9004	0.0000		
EXR	I	2.9723	1.0000	-4.4144	0.0017	I(1)	
	I & T	1.0321	0.9998	-5.3297	0.0009		
	N	2.6687	0.9972	-4.0931	0.0002		
GRV	I	-1.3073	0.6124	-10.4878	0.0000	I(1)	
	I & T	-4.5336	0.0059	-15.2974	0.0000		
	N	1.3058	0.9479	-7.4500	0.0000		
GEX	I	0.6175	0.9878	-10.4511	0.0000	I(1)	
	I & T	-3.7183	0.0370	-24.0329	0.0000		
	N	1.8188	0.9808	-8.8119	0.0000		
INF	I	3.1004	1.0000	-8.9598	0.0000	I(1)	
	I & T	-3.6676	0.0412	-19.6452	0.0000		
	N	8.7065	1.0000	-5.6876	0.0000		

Source; Author's Compilation

The null hypothesis for the Phillip Perron (PP) unit root test is that the variable has unit root or non-stationary and the alternative is the series does not have unit root. The null hypothesis is rejected if the probability value of the test statistic is less than 0.05 - the choosen level of significance, otherwise the null hypothesis is do not reject. From Table 4.1 the probability values of exchange rate (EXR), government revenue (GRV), government expenditure (GEX) and inflation (INF) on the fourth column in Table 4.1 are greater than 0.05, while the

probability value of debt servicing (DSV) is 0.0288 which is less than 0.05. These showed that the first set of variables have unit root or are non-stationary at level, while the later variable does not have unit root or stationary at level. Meanwhile, as shown in the in the sixth column of Table 4.1, the probability values of the second difference of of exchange rate (EXR), government revenue (GRV), government expenditure (GEX) and inflation (INF) are less than 0.05. These indicated that the variable become stationary after second difference. Given that the variables of the model have mixed order of integration, autoregressive distributed lag (ARDL) model bound test is used to determine the existence of long run equilibrium relationship between the dependent variable and the independent variables.

Table 4.2 Autoregressive Distributed Lag (ARDL) Model Bound Test

Test Statistic	Value	Sign	Lower Bound I(0)	Upper Bound I(1)
F-statistic	9.798200	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source; Author's computation using Eviews 10

For the ARDL model, the value of the F-statistic is compared with the upper and lower bound values at the choosen level of significance to determine the existence of long run equilibrium relationship in the model. If the value of the F-statistic is higher than the value of the upper bound, at the choosen level of significance, long run equilibrium relationship in the model is established. If the value of the F-statistic is less than the lower bound value, long run equilibrium relationship does not exist in the model and if the value of the F-statistic is a value in-between the upper and the lower bound values, the test in inconclusive. From Table 4.2 the value of the F-statistic (9.798200) is larger than the values of the upper bound at the 5% level of significance (3.49). This showed that the necessary condition of cointegration exist in the model. The sufficient condition is determined by the statistical significance of the coefficient of the error term of the error correction model.

4.3. Vector Error Correction Model and Short Run Dynamics

ARDL Error Correction Regression
Dependent Variable: D(DSV)
Selected Model: ARDL(1, 0, 4, 2, 4)
Case 2: Restricted Constant and No Trend
Date: 03/10/25 Time: 05:57
Sample: 1 30
Included observations: 26

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GEX)	-0.000233	8.11E-05	-2.876375	0.0165
D(GEX(-1))	-0.000324	7.44E-05	-4.358625	0.0014
D(GEX(-2))	-0.000295	0.000120	-2.455712	0.0339
D(GEX(-3))	0.000101	6.55E-05	1.535565	0.1557
D(GRV)	-0.000350	0.000125	-2.809338	0.0185
D(GRV(-1))	0.000293	0.000133	2.212304	0.0514
D(INF)	-14.61152	3.942758	-3.705913	0.0041
D(INF(-1))	2.993163	4.239542	0.706011	0.4963
D(INF(-2))	-5.909634	5.084270	-1.162337	0.2721
D(INF(-3))	34.39654	8.117170	4.237504	0.0017
ECT(-1)	-1.470166	0.156557	-9.390623	0.0000

R-squared	0.935893	Mean dependent var	39.99193
Adjusted R-squared	0.893155	S.D. dependent var	415.2623
S.E. of regression	135.7371	Akaike info criterion	12.95543
Sum squared resid	276368.6	Schwarz criterion	13.48770
Log likelihood	-157.4205	Hannan-Quinn criter.	13.10870
Durbin-Watson stat	2.633317		

Source; Author's Computation

The sufficient condition for the existence of cointegration or long run equilibrium relationship among the variables is that the one period lag of the coefficient of the error correction term ECT(-1) has negative sign, is less than one and statistically significant. From Table 4.4 the coefficient of the error correction term (ECT(-1) is a negative value -1.470166) and its probability value; (0.0000) is less than 0.05, and statistically significant. However, the value of the coefficient is greater than one. This a case of oscillating convergence, meaning for any short-run disequilibrium, equilibrium is not restored in the next period. However, the sufficient condition for the existence of long run equilibrium relationship between the dependent variable and the independent variables exist.

Table 4.4 Long run Result

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXR	0.660621	0.279093	2.367028	0.0395
GEX	0.000197	0.000189	1.042848	0.3216
GRV	-0.000932	0.000320	-2.909085	0.0156
INF	2.317166	3.557091	0.651422	0.5295
C	213.0975	406.7023	0.523964	0.6117

EC = DSV - (0.6606*EXR + 0.0002*GEX -0.0009*GRV + 2.3172*INF +
213.0975)

Source; Author's Computation

The long run result in Table 4.4 showed that, the probability values of EXR and GRV are 0.0395 and 0.0156 respectively, but the probability values of GEX and INF are 0.3216 and 0.5295 respectively. While the former were less than 0.05, the later are greater than 0.05. Thus, exchange rate (EXR) has a significant positive relationship with debt servicing (DSV), government revenue (GRV) has a negative significant relationship with debt servicing (DSV). However, government expenditure (GEX) and inflation (INF) have statistically significant relationship with debt servicing (DSV).

4.1.2 Diagnostic Test

The model is subjected to diagnostic test to assert the adequacy of the model

Table 4.5 Breusch-Godfrey Serial Correlation LM Test

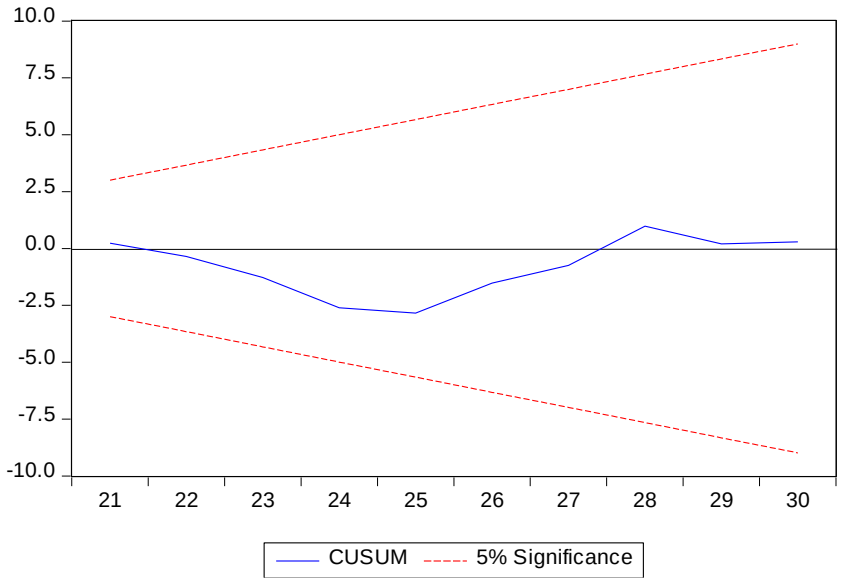
Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.198413	Prob. F(2,8)	0.3506
Obs*R-squared	5.993895	Prob. Chi-Square(2)	0.0499

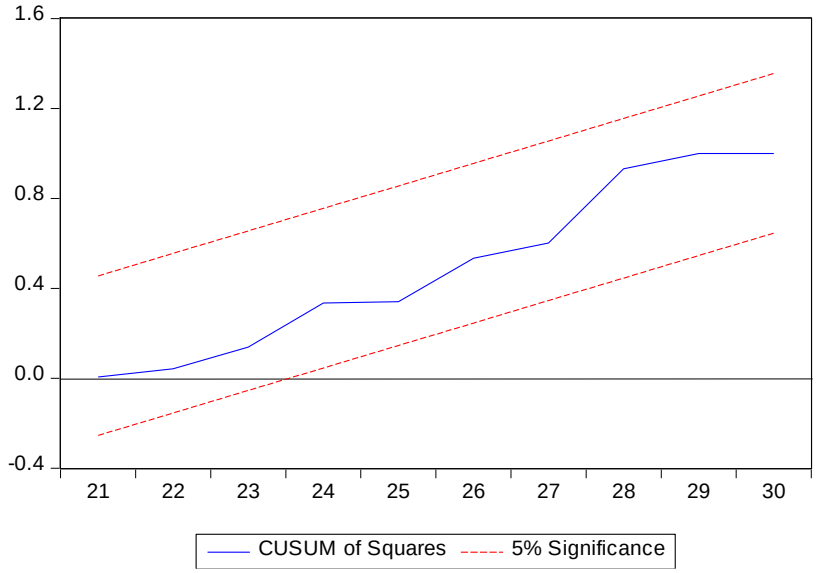
Source; *Author's Computation*

The null hypothesis for the Breusch-Godfrey serial correlation LM test is that there is no correlation in the model. The decision rule of the test is reject the null hypothesis if the observe R–square's probability value is less than 0.05, otherwise the null hypothesis is not rejected. The probability value for the observe R–square is 0.0499 which is greater than 0.05, following, the null hypothesis that there is not serial correlation in the model cannot be rejected. The result showed that the model is free from the econometric problem of serial correlation.

Figure 4.1 Stability Test

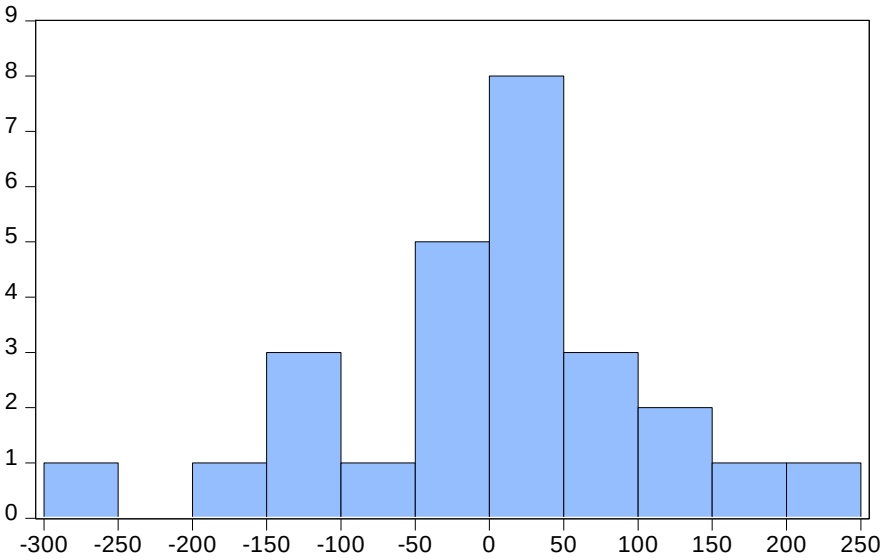


The CUSUM line is within the 5% significant line and indicated that the model is stable. However, the CUSUM result is a necessary condition. The sufficient condition for stability is the CUSUM of squares result.



The CUSUM of squares result shows that the CUSUM line is within the 5% significant line in throughout the period. This shows that the model is stable.

Figure 4.2 Normality Test



Series: Residuals	
Sample 5 30	
Observations 26	
Mean	-6.63e-13
Median	8.009745
Maximum	213.8412
Minimum	-263.2478
Std. Dev.	105.1415
Skewness	-0.245096
Kurtosis	3.438138
Jarque-Bera	0.468274
Probability	0.791254

The null hypothesis for the Jarque-Bera test is that the error terms are normally distributed and the alternative is the error terms are not normally distributed. The decision rule is; reject the null hypothesis is the probability value of the Jarque-Bera is less than 0.05. From Figure 4.1, the Jarque-Bera probability value is 0.791254. Thus, the null hypothesis that the error term of the model is normally distributed cannot be rejected. This showed that the error term of the model is normally distributed.

5. DISCUSSION

The study reveals a significant positive relationship between the exchange rate and debt servicing, meaning that as the exchange rate increases, the cost of servicing external debt also rises. This is consistent with the theoretical understanding that a depreciation of the local currency (in this case, the Nigerian Naira) makes foreign-denominated debt more expensive to repay. This finding is supported by similar research, such as that by Aluko & Ogunleye (2020), who found that exchange rate depreciation in developing economies often exacerbates the burden of external debt. However, a negative significant relationship between government revenue and debt servicing was found suggesting that as government revenue increases, the pressure on debt servicing decreases. This implies that higher revenues enable the government to better manage debt obligations. This finding aligns with Ogunleye (2019), who found that increases in government revenue can mitigate external debt burden in the short run. The result also showed that government expenditure and inflation have statistically significant relationships with debt servicing in the long run, suggesting that fiscal and monetary policies play a vital role in shaping the debt servicing dynamics. These long-run relationships are consistent with studies like Nwachukwu & Odo (2021), who found that inflation and government spending are key determinants of the sustainability of debt in developing countries.

Meanwhile, in the short run, the study identified oscillating convergence, indicated by the negative coefficient of the one-period lagged error term (-1.470166). This finding suggests that the debt servicing dynamics adjust toward equilibrium over time, though not in a smooth manner. Oscillating convergence implies that there are short-term fluctuations before reaching a stable long-term equilibrium. This result aligns with Adebiyi & Osinubi (2021), who also observed oscillating convergence in the debt servicing adjustment process in Nigeria. Notwithstanding, Adebiyi & Osinubi (2021) observed that government expenditure and inflation did not significantly affect debt servicing in the short run, challenging the long-run conclusions of the current study.

6. CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The study provided important insights into the dynamics between exchange rates, government revenue, government expenditure, inflation, and external debt servicing. The findings revealed that exchange rate (EXR) has a significant positive relationship with debt servicing (DSV), implying that depreciation of the naira increases the cost of servicing external debt, thereby exacerbating the country's debt burden. Furthermore, the study found that government revenue (GRV) has a negative significant relationship with debt servicing (DSV), highlighting the importance of increased revenue generation in alleviating the pressure on debt servicing. Additionally, the research found that government expenditure (GEX) and inflation (INF) both have a statistically significant relationship with debt servicing. Higher government expenditure, particularly when financed by debt, contributes to a rise in debt servicing costs, while inflation further intensifies this by increasing the nominal value of debt obligations. These results suggested that external debt management in Nigeria is significantly influenced by exchange rate fluctuations, fiscal policies, and inflation dynamics, which all play a role in determining the burden of debt servicing.

Recommendations

Following from the result and conclusions, the study recommended that measures such as effective foreign exchange reserves management and encouraging export growth could help in reducing exchange rate volatility, ultimately lowering the external debt burden. It is also crucial for the Nigerian government to implement strategies that increase revenue generation. Strengthening tax collection systems, expanding the tax base, and reducing reliance on oil revenues could provide more resources to manage debt obligations effectively. More so, it is recommended that the government prioritize fiscal discipline, ensuring that public spending is aligned with long-term economic growth and debt sustainability. Given the challenges of servicing external debt, it may be prudent for Nigeria to explore debt restructuring options, including renegotiating terms with creditors to extend repayment periods or reduce interest rates. This could help ease the short-term pressure of debt servicing and create more fiscal space for development projects.

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