

Exchange Rate and Economic Growth in Nigeria: Reconsidering the Evidence

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ABSTRACT: This study investigates how exchange rate movements have shaped Nigeria's economic growth over nearly four decades, spanning from 1986 to 2024. To measure economic growth, RGDP growth rate is adopted as the outcome variable in the data analysis. The variables that explained this nexus consisted of exchange rate, exports, imports and inflation rate. Data on these macroeconomic indicators were sourced from CBN Statistical Bulletin (2024) which were analyzed using Autoregressive Distributed Lag (ARDL) model. The estimated results revealed that exchange rate marginally exerted significant negative impact on RGDP growth in the long run at 8% level of significance but had no impact on economic growth in the short run. Exports impacted positively on RGDP growth both in the long-term and short-term periods, while imports and inflation rate both exhibited significant negative impact on RGDP growth in the long run but had mixed impact on RGDP growth in the short run. The study concludes that the marginal negative impact of exchange rate on RGDP growth has implications for trade policy as well as monetary and fiscal policies. The study recommended among other things that the CBN and other financial sector regulators should adopt policies that reduce the volatility of the Naira. This may involve reducing over-reliance on imported goods and boosting foreign exchange earnings from non-oil exports

KEYWORDS: Exchange Rate, Economic Growth, Exports, Imports, ARDL, Nigeria.

1. INTRODUCTION

Exchange rate is one of the most critical macroeconomic variables in any economy, particularly for countries with developing economies like Nigeria. It serves as a bridge between domestic and international markets, impacting inflation, commerce, investment, and general economic progress. Exchange rate is necessary for countries to be part of international trade which is necessitated by unequal resource endowment across countries of the world. International trade also arises because countries possess different levels of productive efficiency, enabling them to benefit from specialization and the gains associated with comparative production advantages, due to variations in resources endowments (Ajekwe et al. 2013). This implies that all countries rely on one another for economic growth and development. Also, countries depend on each other to exchange commodities and services that each nation needs, but in order to do so, the importing nation must exchange its currency for the currency of the exporting nation. Thus, the cost of these products and services as paid for by the importing country is what is known as currency exchange rate. It represents the worth when a nation's currency is exchanged for another. It is a key determinant of international trade, investment decisions, inflation, and overall economic growth (Harvey, 2012).

Exchange rate in Nigeria has been the focus of heated discussion and legislative action, considering the nation's high reliance on imports and susceptibility to external uncertainties. For instance, changes in the price of oil globally (Odoh et al., 2023). exchange rate fluctuations have implications for inflation, employment, and poverty reduction efforts in Nigeria. For instance, the US dollar was worth N2.02 to the naira in 1986. However, by December 2023, the parallel market rate was more than N1,500 per dollar, while the official currency value had dropped to N1,099.05 per dollar (CBN, 2023). Nigeria's economic stability has been severely impacted by this ongoing devaluation, which has an impact on key sectors including manufacturing, services, and agriculture. The value of currency exchange is crucial in determining how competitive any nation's exports are in the global market, while also influencing the cost of goods imported into the country. A weak exchange rate makes imports more expensive, leading to higher production costs and inflation, however, a high exchange rate may reduce exports' ability to compete on the international market. (Oyejide, 2005). Nigeria's economy is mostly reliant on imports. including machinery, refined petroleum products, and consumer goods. Beyond trade, the exchange rate has a square attitude regards to cost of living as much as overall wellbeing of a population, while fluctuations in its value can drive up prices and erode purchasing power. (Adeniran et al., 2014). Moreover, the value of the currency is substantially linked to Nigeria's balance of payments (BOP). Nigeria oil exports, hence cost of oil throughout the world

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contributes significantly to foreign exchange revenues. When oil prices are high, the country experiences an inflow of foreign exchange, which strengthens the naira. On the other hand, the naira depreciates when oil prices decline, as was the case during the 2014–2016 oil price slump. This can result in a loss of foreign reserves and increase pressure on the whole economy (Mafeni & Okoye, 2024). This reliance on oil exports emphasises how crucial it is to comprehend the profound effects of exchange rate changes on Nigeria's overall financial and monetary results.

With respect to exchange rate management experience in Nigeria, a fixed exchange rate regime was adopted shortly after independence in 1960, with the British Pound Sterling as an anchor for the national currency. The Exchange Control Act of 1962 gave the CBN the power to earn and distribute foreign currency within the nation. The parity between the Naira, the pound sterling, and the US dollar was broken after the realignment with the US dollar, the switch from the pound to the Naira, and the subsequent devaluation of the currency in 1973. The Naira was then pegged to a basket of currencies of Nigeria's main trading partners, including the United Kingdom, the United States of America, Germany, France, Japan, Switzerland, and the Netherlands. A managed exchange rate system was implemented in place of the rigorous currency control regime that was in effect between 1977 and 1981 in an attempt to lessen the strain on the external sector. In order to curb frivolous demand for foreign cash, the exchange rate was realigned and made more flexible after the Economic Stabilisation Act of 1982. These policies persisted until the SAP was implemented in 1986 (Eniekezimene, 2012).

With the establishment of the Second-Tier Foreign currency Market (SFEM), the SAP reforms resulted in a market-driven currency rate system. SFEM was succeeded by a series of unsuccessful attempts at managing the Naira's exchange rate administratively. The Dutch Auction System (DAS)-April 1987, the Autonomous Foreign Exchange Market (AFEM)-1988, the Inter-bank Foreign Exchange Market (IFEM)-1989, and DAS (1990) are some of the several exchange rate management regimes. The DAS was restored for the third time on July 22, 2002, as part of "Guided Deregulation" based on a Dual Exchange Rates regime after IFEM failed. The IFEM's numerous malpractices and inability to achieve policy objectives led to the reintroduction of the Dutch Auction System. The DAS was implemented to improve foreign exchange management transparency, attain a realistic naira exchange rate, and deter speculative foreign exchange demand. The Central Bank of Nigeria (CBN) ran the Retail Dutch Auction System (RDAS) and the Wholesale Dutch Action System (WDAS) between 2004 and 2015. Later, the CBN implemented the Inter-bank currency System, in which it actively interfered to regulate the currency rate. In order to relieve pressure on foreign exchange and protect the nation's foreign reserve, the CBN introduced a controlled exchange rate system in 2016. The era between 2016 and 2023 was marked by managed floating and various windows. But by 2017, the CBN had opened the door for exporters and investors, resulting in a multi-rate system and a significant parallel that nearly completely upended the nation's international economy. Through a willing buyer and willing seller strategy, the CBN implemented a unified exchange system in June 2023, combining all segments into a single Nigerian Foreign Exchange Market (NFEM). In 2024, the system changed to a floating exchange rate regime, and in 2026, the regulatory framework was revised.

Several studies in Nigeria have examined the nexus between exchange rate and the performance of the Nigerian economy recent years producing varying outcomes. For instance, Oluwole and Akinboade (2023); Musa, et al., (2023); Ekeagwu, et al., (2023); Sa'ad, et al., (2023); Mafeni, et al., (2024) and Aliyu, et al., (2024), all studied the impact of exchange rate on external trade using both the linear autoregressive distributed lag (ARDL) and non-linear autoregressive distributed lag (NARDL) techniques as well as the error correction model (ECM). Their findings were mixed, revealing long run significant positive impact and short run significant negative impact on imports and exports. The studies on exchange rate and economic growth including Oke and Adetan (2018); Alubuo and Ezinwa (2020); Odoh, et al., (2023) and Ozigbo, et al., (2023). These studies used the ARDL technique in evaluating the nexus between the variables. However, the scope of their analysis did not incorporate the recent data with unified exchange rate system in the country. Given that the exchange rate sits at the heart of Nigeria's economic stability, this research aims to investigate its effects on economic growth in Nigeria. Specifically, the research examines the manner which exchange rate affects economic growth through itself alongside exports, imports, and inflation. By doing so, the study intends to offer insightful information to stakeholders and policymakers in their efforts to promote sustainable economic growth and stability. In light of this, the study's focus is on the following set of research questions: How does Nigeria's economic growth depend on exchange rate? What impact does exchange rate have on Nigeria's export and import performance? What connection exists between Nigeria's inflation rate and the exchange rate? The study also tested the hypotheses that are derived explicitly from the above research questions.

2. LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Theory of Balance of Payments (BOP)

This theory states that under free exchange rates, the nation's exchange rate is determined by its balance of payments. The exchange rate increases when the balance of payments is favourable and decreases when it is unfavourable. According to this hypothesis, the supply and demand for foreign currency affect the exchange rate. The negative side of the balance of payments generates the need for foreign exchange. It is equivalent to the sum of loans and investments made overseas plus the amount paid to the foreign nation for products and services acquired from it. The credit side of the balance of payments is where the foreign exchange supply originates. It is equivalent to all payments made by the foreign nation to our nation for products and services acquired from us, as well as loans given out and investments made within this nation. If debits and credits are equal, the balance of payments is balanced. The balance of payments is unfavourable if debits are more than credits. Conversely, it is advantageous if there are more credits than debits. An unfavourable balance of payments indicates that there is a greater demand than supply for foreign currency. As a result, the home currency's external value decreases relative to the foreign currency. The exchange rate increases as a result. Exports rise when the exchange rate drops below the equilibrium exchange rate in an unfavourable balance of payments scenario. This eliminates the adverse balance of payments and restores the equilibrium exchange rate. Therefore, the supply and demand for foreign currency, as shown by the debit and credit sides of the balance of payments, determine the exchange rate at any given time. Jhinghan (2006)

2.1.2 Purchasing Power Parity (PPP) Theory

The Purchasing Power Parity (PPP) concept was developed in 1918 by Swedish economist Gustav Cassel. Concerning PPP proposition, if there are no transportation costs, tariffs, or other obstacles, the exchange rate between two nations should eventually alter so that the same goods or services will cost the same in each nation. Cassel (1918). This implies that there should be parity in prices between two nations. This notion is based on David Ricardo's law of one price, which states that equivalent goods should, in theory, cost the same in two countries when expressed in a single currency. The PPP hypothesis comes in two forms: absolute PPP and relative PPP. Relative PPP contends that fluctuations in the exchange rate should represent variations in inflation rates between the two nations over time, but absolute PPP maintains that ratio of two countries' respective pricing levels should be reflected in exchange rate between them (Taylor & Taylor, 2004). The relative PPP theory states that the naira should gradually weaken to offset the inflationary gap between Nigeria and other nations (CBN, 2023). However, deviations from PPP are frequent due to factors like differences in product quality, transportation costs, and trade barriers. In Nigeria, the PPP theory is especially pertinent because Nigeria has continuously recorded higher inflation rates than its major trading partners.

2.1.3 Monetary Theory of Exchange Rate

Exchange rates are influenced by each country's money supply and demand, according to Milton Friedman and Robert Mundell's Monetary Theory of Exchange Rates (Friedman, 1953). While a decrease in the money supply often results in deflation and currency appreciation, an increase in the money supply tends to feed inflation and drive currency depreciation. The Central Bank of Nigeria (CBN) oversees the majority of Nigeria's money supply through monetary policy. To preserve the value of the naira, for example, the CBN may take a tightening posture during times of high inflation by raising interest rates or reducing the money supply (CBN, 2023). However, long-standing structural issues, like as Nigeria's excessive reliance on oil exports and the underdevelopment of its banking sector, can limit the efficacy of such initiatives.

2.1.4 Elasticity Approach to Exchange Rate

Alfred Marshall and Abba Lerner created the Elasticity Approach, which examines how fluctuations in exchange rates affect a country's trade balance (Marshall, 1923). According to the Marshall-Lerner criterion, a currency depreciation will only improve the trade balance if the sum of the price elasticities of import and export demand is more than one. This strategy is especially pertinent to Nigeria, because the currency rate has a big influence on the country's trade balance. As the naira weakens, Nigerian exports become more accessible and competitive on the global market. It concurrently drives up production costs and inflationary pressures by increasing the cost of imports (Oluwole & Akinboade, 2023). The importance of currency rate management in promoting economic stability is shown by this trade-off.

2.1.5 Endogenous Growth Theory

Romer published his idea of endogenous growth in 1990. Proponents of this theory emphasise the significance of innovation, human capital, and technology as key drivers of economic growth and contend that internal activities inside a system directly contribute to economic progress. This theory contends that progress is propelled by internal factors like creative thinking, education, and scientific discovery, in contrast to the Solow-Swan model, which sees technological improvements as an external force (Romer, 1994). The Endogenous Growth hypothesis is especially pertinent to Nigeria, which aims to diversify its sources of income away from the oil sector and make investments in human capital and technology. By lowering uncertainty and drawing in

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foreign investment in R&D, a stable exchange rate helps foster an innovative atmosphere. On the other hand, by raising the price of imported technology and deterring long-term investment, exchange rate volatility might impede innovation (Odoh et al., 2023). This thesis emphasises how crucial exchange rate stability is to Nigeria's shift to a knowledge-based economy.

2.2 Empirical Review

The impact of exchange rates on Nigeria's economy has been examined in a number of studies, however the results are inconsistent and many contain methodological flaws. A critical evaluation of these research is presented here, emphasising their limitations, inconsistencies, and contributions. Adebayo et al. (2022) investigated the impact of exchange rate fluctuations on Nigeria's GDP, focusing on the naira's performance in relation to other major currencies. According to their results, a decline in the value of the naira tends to increase inflation while also decreasing Nigeria's economic development. The authors demonstrated using a Vector Autoregression (VAR) model that a declining naira raises import costs, resulting in cost-push inflation and slower GDP growth. A VAR model is appropriate for capturing short-term impacts since it allows the analysis of dynamic interactions between variables. But the study ignores long-term trends in favour of short-term effects. Furthermore, it ignores structural shifts in the economy, such as the transition from reliance on oil to diversification. Therefore, to comprehend how Nigeria's long-term exchange rate policy affects economic growth, particularly in the context of economic diversification, a long-term study is required.

The impact of currency rate fluctuations on Nigeria's economy was examined by Aliyu et al. (2023). Their study indicates that while exchange rate depreciation may temporarily improve exports, it has negative long-term effects on economic growth due to higher inflation and lower buying power. The authors showed that the rate of currency conversion volatility has a dampening effect on GDP growth and overall income levels using an estimate technique called the Generalised Method of Moments (GMM). Because it solves the issue of endogeneity and produces more reliable estimates of the relationship between economic growth and currency conversion rates, the GMM technique was especially well-suited for this investigation. In order to provide a more comprehensive analysis of Nigeria's exchange rate dynamics, future research should include global variables like oil prices and foreign investment flows, as the investigation mainly relies on aggregate data, which obscures the larger macroeconomic context in which exchange rate changes occur.

Odoh, et al. (2023) investigated how changes in currency rates impact Nigeria's GDP using information from 2003 – 2022 extracted from the Central Bank of Nigeria's statistical report. They discovered that changes in currency conversion rates significantly impact GDP by using the Autoregressive Distributed Lag (ARDL) model in their investigation, with about 72.6% of GDP variation impacted by changes in exchange rates. As stated via analysis, raising the exchange rate instability is harmful to Nigeria's economic growth, aligning with findings from Vieira et al. (2016) and Thomas (2019).

Akpan and Atan (2011) investigated the nexus between exchange rate movement and real growth of the economy in Nigeria between 1986 and 2010 using quarterly time series data. Simultaneous equation model consisting of variables such real gross domestic product growth (RGDPG), nominal exchange rate (EXR), money supply (MS), inflation rate (INF) were used as macroeconomic variables while applying the generalized method of moments (GMM) technique of analysis to evaluate the direct and indirect relationship of the model. The findings showed no strong direct nexus between exchange rate and economic growth but exerted direct positive effect of money supply on economic growth. These findings align with the current study as it incorporates directly the effect of exchange rate on economic growth and indirectly the effect of inflation in the simultaneous equation model. However, the current study used a single equation model to examine the nexus between exchange rate and economic growth using annual time series data extending to 2024.

Oke and Adetan (2018) focused on the factors influencing Nigeria's exchange rate between 1986 and 2016 utilizing ARDL bounds testing. They discovered that the exchange rate is positively impacted by GDP, inflation, and interest rates, while trade openness had a negative effect. This work provides important context for understanding the macroeconomic interactions among the variables considered in this research.

Alugbuo and Ezinwa (2020) examined the efficiency of fiscal and monetary program in the face of exchange rate volatility in Nigeria. Using an ARDL model, they found that exchange rate instability negatively affects growth, while monetary policy remained more effective than fiscal interventions. These findings are consistent with the negative correlation found in this study between variations in exchange rates and economic performance.

Ramat, et al., (2022). Examined the effect of exchange rate on the Nigerian economy from 1981 to 2021. Gross domestic product proxied the growth of the economy while exchange rate was the explanatory variable. the autoregressive distributed lag (ARDL) and the error correction model (ECM) techniques were used to evaluate the model after ascertaining all the pre-estimation tests. The bounds test result revealed that no long run relationship existed between the variables. Relying on the short run ARDL result, the authors found positive but insignificant relationship between exchange rate and economic growth. This study aligns with the

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current study as it focused on the key variables of the study. However, the study ignored the role of interrelationship among macroeconomic variables that could determine how exchange rate interact with economic growth. The current study brought in interrelated variables such as exports, imports and inflation to explain the impact of exchange rate on economic growth.

Ozigbo et al. (2023) conducted a quantitative investigation of the connection between variations in currency rates and Nigeria's economic growth, using the Error Correction Model. Their outcomes confirmed a substantial inverse link between GDP and exchange rate, with interest rates producing a similarly adverse effect. These findings align closely with those of the present study, which also demonstrates that exchange rate depreciation and inflationary pressures act as constraints on economic growth. Oluwole and Akinbode (2023) found that Nigeria's import industry suffers from exchange rate volatility, which raises manufacturing costs and slows economic growth. Using the Autoregressive Distributed Lag (ARDL) model, the authors showed how a falling naira increases the cost of imported inputs, which in turn lowers local production. This paper effectively uses the ARDL model since it looks at long-term correlations between variables. Nevertheless, the analysis ignores the export sector in favour of concentrating just on the import sector. This limits its ability to provide a comprehensive analysis of how currency rates affect Nigeria's trade balance. In order to provide a more thorough and impartial view of how the exchange rate affects trade flows, future studies should look at both imports and exports.

The effects of fluctuating currency rates on Nigeria during oil price shocks were examined by Mafeni and Okoye (2024). They used data from Nigeria's Central Bank from 2000 to 2020 for their research. The study examined how changes in exchange rates during shocks to the price of oil affect Nigeria. Using a Cointegration and Error Correction Model (ECM) framework, the authors found that falling oil prices weaken the naira, which in turn slows GDP growth. ECM is a robust method that makes it possible to analyse both short-term and long-term relationships. Nevertheless, other policy responses to oil price shocks, such as fiscal adjustments or diversification, are not examined in this study. Future research should examine how policy initiatives like currency rate stabilisation and diversification might help Nigeria mitigate the impact of oil price shocks.

Umaru et al. (2023) studied how Nigerian exports were affected by exchange rate fluctuation between 2008 and 2021. Utilizing the ARDL-Error Correction Model, the study examines how varying measures of Nigeria's export performance is influenced by fluctuations in currency rates. The results reveal that volatility with time, the actual effective exchange rate possess a consistently detrimental impact on exports. Thus, data suggests stabilizing exchange rate of naira and diversifying the country's export basket to improve trade performance.

Aliyu et al. (2024) examined using the ARDL model on association between Nigeria's GDP, foreign import trade, and exchange rate. The variables have a long-term association, according to their findings, with a considerable adjustment mechanism showing that a large portion of disequilibrium is corrected annually. This aligns with the present study, that uses the ARDL model should take into consideration both long-term dynamics and short-term variations.

Azu (2025) investigated the nexus between exchange rate and economic growth in Nigeria from 1990 to 2024. Gross domestic product growth was the dependent variable while exchange rate, inflation rate, and foreign direct investment were independent variables. The study used ordinary least squares regression technique of analysis in evaluating the formulated model. The findings of the revealed that exchange rate exerted significant positive impact on economic growth. Inflation was insignificant while foreign direct investment had significant positive impact on exchange rate. This result implies that economic growth was attained due to exchange rate depreciation which attracted the influx of foreign direct investment. The current study is similar to this study from the perspective of exchange rate depreciation which attracts exports of a country in the international market.

Nyeche (2024). Studied the dynamic impact of exchange rate on economic growth in Nigeria from 1985 to 2024. Real gross domestic product proxied economic growth while official exchange rate, trade openness and external reserves were explanatory variables. The autoregressive distributed lag (ARDL) technique of analysis was used to analyse the model after pre-estimate tests were conducted on the time series and the variables. The result revealed that both official exchange rate and external reserves had significant positive impact on economic growth while trade openness exerted insignificant positive impact on economic growth. This study is related to the current study for including trade openness as explanatory variable. However, the current study decomposed trade openness into exports and imports to better appreciate the exact impact each exert on economic growth through the exchange rate.

Ekeagwu et al. (2023) examined the association between Nigeria's GDP and trade openness using data from 1990 - 2021. Their findings demonstrated that exchange rates and trade openness had a detrimental impact on economic growth, whereas interest rates and foreign direct investment had beneficial long-term effects. These findings resonate with the current study's inclusion of exports and imports as key trade indicators influencing GDP growth.

Sa'ad et al. (2023) used a Nonlinear ARDL (NARDL) model to examine how changes in oil prices and exchange rates affected Nigerian inflation. Their findings supported the asymmetric effect that depreciation of the currency rate had a greater impact on

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inflation than appreciation. This demonstrates how inflation interacts with currency rates and macroeconomic stability, supporting the inclusion of inflation in the current model.

Ewubare and Ushie (2022) looked studied the relationship between currency rates, inflation, and GDP growth in Nigeria from 1981 to 2020. Their research revealed that while interest rates had a favourable effect on economic growth, changes in inflation and exchange rates had a negative effect. The authors demonstrated that exchange rate volatility increases inflation, which slows GDP growth, using descriptive statistics and ARDL. The paper offers a comprehensive analysis of the relationships between inflation, economic growth, and currency rates. However, the research disregards external factors that might affect Nigeria's inflation and exchange rate, such as the status of the global economy. To give a more comprehensive picture, future studies should take into account global factors like oil prices and international investment flows.

Exchange rate fluctuations have a negative effect on economic growth, according to Adeniran et al. (2014), who looked at the years 1986–2012. Using Ordinary Least Squares (OLS), the authors showed how a lower exchange rate increases the value of capital items and raises the cost of raw materials, which slows down growth. The paper analyses the relationship between the dynamics of currency rates and economic development in an easy-to-understand manner. However, using OLS restricts the study's capacity to take dynamic interactions between variables and endogeneity into consideration. Future studies should use more sophisticated econometric methods, like VAR or GMM, in order to deal with these limitations.

3. MATERIAL AND METHODOLOGY

This study employed the ex-post facto research design to investigate the impact of exchange rate on economic growth in Nigeria. This research design was found appropriate because the research employed secondary data whose value can not be altered. The times series data for the study were collected from Central Bank of Nigeria's statistical bulletin (2024) and the the National Bureau of Statistics' annual reports (2022 – 2024). Gross domestic product (GDP) growth rate was used as proxy for economic growth and dependent variable, exchange rate, exports and imports were used as explanatory variables while inflation rate was the control variable. The data covered the period between 1986 and 2024. Theorrtically, this period was considered appropriate considering Nigeria's major structural reform known as the structural adjustment programme that began in July 1986 up to 1993. Technically, the time frame up to 38 years is long enough for a normally distribited time series. The study proceeds in this section with a specification of the model to evaluate the impact of exchange rate on economic growth in Nigeria.

3.1 Model Specification

The Balance of Payments (BOP) Theory, which holds that a nation's exchange rate and trade flows (exports and imports) are crucial factors in determining its economic growth, is the foundation of this study. This theory holds that ongoing trade deficits can cause currency depreciation, which in turn affects inflation and the state of the economy as a whole. This paradigm aligns with the study's focus on analysing how fluctuations in inflation, trade performance, and currency rates affect Nigeria's GDP growth. Additionally, the function of inflation in the model is supported by Monetarist Theory of Inflation, which embraces that the degree to which price increases diminish purchasing power and impede economic progress.

Empirically, this study draws inspiration from the work of Edwards and Sebastein (2000) which was later enhanced by Akpan and Atan (2011). they employed a simultaneous equation model using the generalized method of moments to look into how the exchange rate affects Nigeria's real GDP. Their findings showed no strong direct nexus between exchange rate and economic growth but exerted direct positive effect of money supply on economic growth. These findings align with the current study as it incorporates directly the effect of exchange rate on economic growth and indirectly the effect of inflation in the simultaneous equation model. However, the current study used a single equation model to examine the nexus between exchange rate and economic growth using annual time series data extending to 2024.

The model's functional form is described as follows:

$$RGDPG = f(EXCR, LEXPT, LIMP, INFLR) \quad (3.1)$$

Where:

GDPG = Real Gross Domestic Product Growth (is a proxy for economic growth)

EXCR = Nominal Exchange Rate

LEXPT = Log of Exports

LIMP = Log of Imports

INFLR = Inflation Rate

The ARDL model is expressed econometrically as:

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$$GDPG_t = \beta_0 + \sum \beta_{1i} \Delta GDPG_{t-1} + \sum \beta_{2i} \Delta EXCR_{t-i} + \sum \beta_{3i} \Delta LEXPT_{t-i} + \sum \beta_{4i} \Delta LIMP_{t-i} + \sum \beta_{5i} \Delta INFLR_{t-i} + \lambda_1 GDPG_{t-1} + \lambda_2 EXCR_{t-1} + \lambda_3 LEXPT_{t-1} + \lambda_4 LIMP_{t-1} + \lambda_5 INFLR_{t-1} + \varepsilon_{1t} \quad (3.2)$$

The estimated error correction model (ECM) is expressed as:

$$RGDPG_t = \beta_0 + \sum \beta_{1i} RGDPG_{t-1} + \sum \beta_{2i} \Delta X_{t-1} + \sum \beta_{3i} ECM_{t-1} + \varepsilon_{2t} \quad (3.3)$$

Where;

X_t = a collection of explanatory variables is represented as a vector or a matrix. ECM_{t-1} = error correction is a concept that describes how quickly the long run is adjusted when hit by a short run drift. ε_{2t} = word for stochastic error. The Wald test result shows that cointegration exists, thus we go on to the next stage of determining the coefficients and the degree of significance. The optimal lag order and the long-term ARDL framework specification were selected according to the Akaike Information Criterion (AIC), utilizing F statistics and ECM. Breusch-Godfrey test and Breusch-Pagan-Godfrey test were conducted for serial correlation and heteroscedasticity.

3.2 Estimation Technique and Procedure

The pre-estimation procedure in this study involved stationarity test of the time series data for estimation employing the Augmented Dickey-Fuller (ADF) unit root test. Following the mixed order of integration of order zero $I(0)$ and order one $I(1)$, the autoregressive distributed lag (ARDL) technique was used in estimating the model after confirming the long run relationship among the variables through the bounds test. Subsequently, the post estimation tests including the Breusch-Godfrey Serial Correlation LM Test, the Breusch-Pagan-Godfrey for heteroscedasticity were conducted.

4. RESULTS AND DISCUSSION OF FINDINGS

4.1 Unit Root Test Result

The unit root test was conducted to ascertain the order of integration of the variable as this technically has implication on the technique of analysis that would be appropriate for the model. Using the Augmented Dickey Fuller (ADF) test, the results revealed that RGDPG and LIMP were stationary at levels, implying that the time series data for this variables integrated of order zero which further means that the series were had no unit root problem. Thus, the null hypothesis that these series had unit root were rejected. On the other hand, EXCR, LEXPT and INFR were found to be integrated of order one. This implies that the time series for these variables had unit root problem at levels but only became stationary after first difference.

Table 4.1: ADF Test Results

Variable	ADF Statistics			Probability		I(d)
	Critical Value (5%)	Levels	First Difference	Levels	First Difference	
RGDPG	-2.943427	-4.082376	ψ	0.0030***	ψ	$I(0)$
EXCR	-2.948404	-1.422861	-4.973820	0.5603	0.0003***	$I(1)$
LEXPT	-2.945304	-2.064516	-3.626784	0.9998	0.0117***	$I(1)$
LIMP	-2.947504	-3.378440	ψ	0.0185**	ψ	$I(0)$
INFLR	-2.946987	-3.533848	ψ	0.0126***	ψ	$I(1)$

Notes: At the 1 percent, 5 percent, and 10 percent significance levels, respectively, ***, **, and * indicate rejection of the stationary null hypothesis. Around intercept, the null hypothesis remains stationary.

Source: Author's calculations performed with E-views 13.

4.2 Bounds Test for Cointegration

In a bid to ascertain whether the dependent variable proxied by GDP growth (GDPG) has a long-term link with its regressors: exchange rate, exports, imports, and inflation, the Pesaran et al. (2001) bounds testing was applied. Consequently, the long-term association between all the variables was examined using the chosen ARDL model (3, 1, 4, 0, 4). The bounds test results displayed in Table 4.2 exceed the upper bound critical value of 4.01 at the 5% significant level, with an F-statistic of approximately 4.38. This demonstrates that GDPG and its regressors; exchange rate, log of exports, log of imports, and inflation rate have a stable long-term relationship. As a result, the null hypothesis; that there is no long-term relationship is rejected. This finding confirms the deployment of ARDL model for further estimation of long-run and short-run dynamics, plus the specification of the Error Correction Model (ECM) with the optimal lag length selected by the information criteria.

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Table 4.2 ARDL Bound Testing Cointegration Analysis

F-Statistics= 4.378473		
Pesaran, Shin and Smith (2001): Unrestricted trend and intercept, k = 4		
	Critical Bound values	
Level of significance	Lower bound	Upper Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Author's computation with the use of E-views13

4.3 Long-Run ARDL Estimates

We estimated the long-run coefficient values in Equation (3.2) after discovering a long-run link between the variables. Based on the AIC, the long-run elasticities were computed. The best model was determined to be ARDL [3, 1, 4, 0, 4], with the outcomes shown in Table 4.3.

Table 4.3 ARDL Long Run Estimates

Dependent Variable: Gross Domestic Product Growth (RGDPG)					
Variables	Coefficients	Std. Error	t-Statistic	Prob	Significance
EXCR	-0.009848	0.005395	-1.825487	0.0846	Marginally
LEXPT	4.555720	0.923450	4.933371	0.0001	Significant
LIMP	-4.312457	1.011047	-4.265339	0.0005	Significant
INFLR	-0.255418	0.036834	-6.934324	0.0000	Significant
C	3.521876	5.345583	0.658839	0.5183	Insignificant

Source: Author's computation with the use of E-views13

Based on the long-run estimation results, exchange rate has a negative coefficient of -0.009848 and statistically insignificant at the 5% level but significant at 10% level. This result implies that at 10% level of significance, exchange rate appreciation impacted negatively on economic growth in Nigeria over the period of our study. Specifically, a unit appreciation in exchange rate reduced RGDPG by 0.009848. Conversely, exchange rate depreciation exerted the opposite impact on RGDPG. Exports were positive and statistically significant to RGDPG which confirms the a priori expectation that exports impact positively on economic growth. Specifically, the coefficient of 4.555720 and the probability value of 0.0001 implies that a unit increase in exports increased RGDPG by approximately 4.56. Imports exerted a significant negative impact on RGDPG confirming its a priori expectation. Specifically, the result show that a 1% increase in imports reduced RGDPG by 4.312457. Inflation rate exerts a significant negative impact on RGDPG as a control variable. This is consistent with theoretical predictions as ongoing inflation reduces purchasing power, skews investment choices, and creates economic uncertainty.

4.4 Short Run ARDL Estimates with Error Correction Model (ECM)

Having analysed the long run estimates of the ARDL result, the next critical step involves estimating the short run dynamics with error correction model (ECM). The ECM is particularly useful in this context as it measures the rate at which any departure is gradually corrected from long run equilibrium. The ECM which is crucial to this estimation must be statistically significant at the 5% level and negative in order to confirm the long run relationship's existence and model's capacity to self-correct and return to equilibrium following a shock.

Table 4.4 ARDL Short Run Estimates

Dependent Variable: RGDPG					
Variables	Coefficients	Std. Error	t-Statistics	Prob	Significance
D(RGDPG(-1))	0.795536	0.212139	3.750072	0.0015	Significant
D(RGDPG(-2))	0.706205	0.127990	5.517645	0.0000	Significant
D(EXCR)	0.005410	0.004177	1.295133	0.2116	Insignificant
D(LEXPT)	6.071857	1.462364	4.152082	0.0006	Significant
D(LIMP)	-0.541768	2.541354	-0.213181	0.8336	Insignificant

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D(LIMP(-1))	-12.219479	2.790930	-4.378282	0.0004	Significant
D(LIMP(-2))	3.504272	1.738499	2.015688	0.0590	Significant
D(LIMP(-3))	3.775336	1.378204	2.739315	0.0135	Significant
D(INFLR)	-0.269916	0.049800	-5.419983	0.0000	Significant
D(INFLR(-1))	0.570327	0.095143	5.994446	0.0000	Significant
D(INFLR(-2))	-0.285960	0.077209	-3.703721	0.0016	Significant
D(INFLR(-3))	0.214096	0.053148	4.028283	0.0008	Significant
CointEq(-1)	-0.332799	0.213559	-6.240888	0.0000	Significant
Diagnostic Test Results: R ² = 0.888354 Adjusted R ² = 0.789113	DW = 2.354597 F-stat = 8.951480 Prob(F-stat) = 0.000015				

Source: Author's computation with the use of E-views13.

In table 4.4 the error correction model is reported as CointEq(-1) and it captures the speed with which the dependent variable readjusts itself in cases of departure from equilibrium. The value of the CointEq(-1) is negative (-0.332799) and statistically significant, affirming that the independent variable sustains the capacity to make adjustments back to the equilibrium point in any case of distortion by 0.33 annually. From the table, the coefficients of two lagged period changes in D(RGDPG(-1)) and D(RGDPG(-2)) are positive and statistically significant indicating that past growth rate in RGDP positively impacted on its current value. Specifically, a unit increase in the first and second lagged period RGDPG increased current RGDPG by 0.795536 and 0.706205 respectively. Exchange rate exerted positive but statistically insignificant impact on RGDPG in the short run. Export exhibited a positive and statistically significant impact on RGDPG in the short run. Specifically, with its coefficient of 6.071857 and probability value of 0.0006, the result implies that a unit increase in export increased RGDPG by approximately 6.1 in the short run. Imports exerted a mixed impact on RGDPG in the short run. Current change in import D(LIMP) showed negative and insignificant impact on RGDPG, the first lagged value of import D(LIMP(-1)) was negative but statistically significant to RGDPG while the second and third lagged periods - D(LIMP(-2)) and D(LIMP(-3)) were positive and statistically significant to RGDPG. Specifically, the results imply that while current period import has negative and insignificant impact on GDPG, a unit increase in one period lagged import D(LIMP(-1)) decreased RGDPG by 12.219479. However, a unit increase in import in the second and third lagged periods D(LIMP(-2)) and D(LIMP(-3)) increased GDPG by 3.504272 and 3.775336 respectively. This means that initial imports such as consumer goods impacted on RGDPG negatively while extended imports in the form of investment goods impacted on RGDPG positively. Inflation rate was statistically significant all through the short run period. However, change in current value of inflation and the second lagged value of inflation D(INFLR) and D(INFLR(-2)) were negative while the first and third lagged values of inflation rate D(INFLR(-1)) and D(INFLR(-3)) were positive.

4.5 Diagnostic Tests

In any econometric analysis, conducting diagnostic tests is necessary to verify the strength, and dependability of the model estimates. This segment provides key post-estimation diagnostics carried out to detect common econometric issues, including model instability, autocorrelation, non-normality and heteroskedasticity.

4.5.1 Serial Correlation Test

The calculated model's residuals were tested for autocorrelation applying Breusch-Godfrey serial correlation LM test. The test produced an Obs*R-squared value of 2.850529 and a p-value of 0.2404. Since the p-value is higher than the 5% significance level, indicating that there is no autocorrelation in the residuals, the null hypothesis that there is no serial relationship cannot be rejected. This implies that residuals aren't autocorrelated therefore serial dependence isn't a problem for the model. The result is shown on table 4.5 below.

Table 4.5: Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.709319	Prob. F(2,16)	0.5068
Obs*R-squared	2.850529	Prob. Chi-Square(2)	0.2404

Source: Author's computation using Eviews 13

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4.5.2 Heteroskedasticity Test

Heteroskedasticity test was carried out to evaluate consistency of error variance. The test produced a p-value of 0.3377 and an Obs*R-squared statistic of 17.76775. The null hypothesis of homoskedasticity cannot be rejected due to this p-value which surpasses the 0.05 threshold, indicating that the model is free from heteroskedasticity because the variance of residuals is constant across data. This would otherwise result in inaccurate statistical inference and ineffective estimations. The result is shown on table 4.6 below.

Table 4.6: Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.159960	Prob. F(16,18)	0.3780
Obs*R-squared	17.76775	Prob. Chi-Square(16)	0.3377
Scaled explained SS	8.888164	Prob. Chi-Square(16)	0.9179

Source: Author's computation using Eviews 13

5. CONCLUSION

The study's conclusions confirm that, in the long run, Nigeria's economic growth is marginally influenced by the exchange rate. The negative influence seen in the results at specifically 8% level of significance shows that when exchange rate depreciates marginally, Nigeria's exports become cheaper and this impacts on economic growth positively as more exports reflect increase in output and income. Imports reduced the growth in real RGDP in the long run but had mix effect on the economy in the short run implying that import limits are required to enhance economic growth. Similarly, inflation exerted significant negative impact on RGDP growth in the long run but showed mix impact in the short run. Overall, the analysis finds that the economy is directly impacted by the exchange rate, and its poor management can slow down growth. Inflation is another serious threat, and trade policies must be revisited to make them more beneficial to long-term development.

5.1. Recommendations

The following suggestions for bolstering and maintaining Nigeria's economic growth are supported by the study's findings:

- (i) Stabilise the Exchange Rate: The Central Bank and other authorities of the financial sector ought to implement measures that lessen the Naira's volatility. This might entail increasing foreign exchange profits from non-oil exports and decreasing an excessive dependence on imported items.
- (ii) Address Inflation at the Root: The government should focus on tackling the causes of inflation, notably in the fields of food production, transport, and energy. Both consumers and companies benefit from low and steady inflation.
- (iii) Diversify the Export Base: Nigeria should invest more in sectors like industry, technology, and agriculture to reduce its over-reliance on crude oil. The nation would generate more foreign cash if it supports small and medium-sized exporters.
- (iv) Encourage Local Production to Lower Imports: Since a large portion of imports are consumer items, policies should be put in place to encourage the production of these commodities locally. In addition to saving money, this will provide employment.

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