IMPACT OF EXCHANGE RATE FLUCTUATION ON ECONOMIC GROWTH IN NIGERIA

BY

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Abstract
This study investigates the impact of exchange rate fluctuations on Nigeria's economic growth using annual time series data spanning 1985–2023. The Autoregressive Distributed Lag (ARDL) model was employed to capture both short-run and long-run dynamics. The results show that past values of GDP significantly influence current growth, with LGDP (-1) having a strong positive effect (0.7800, $p < 0.01$), while LGDP (-4) exerts a negative influence (-0.3992, $p < 0.01$), confirming persistence and adjustment dynamics in growth. Exchange rate fluctuations display a mixed effect: the contemporaneous coefficient is negative (-0.00018, $p < 0.10$), but its lag [EXR (-1)] is significantly positive (0.00035, $p < 0.01$), suggesting short-run disruptions followed by adjustment gains. Inflation is found to be volatile, alternating between positive and negative effects across lags, with INF (-2) showing a strong negative effect (-0.00080, $p < 0.01$). Interest rates exert mostly positive influences, particularly INT (0.00077, $p < 0.05$), though INT (-3) turns negative (-0.00080, $p < 0.01$), highlighting possible adverse long-term effects. Foreign direct investment (FDI) demonstrates both negative and positive contributions, with immediate effects being negative (-0.00993, $p < 0.01$), but later lags [FDI (-2) = 0.00576, $p < 0.05$; FDI (-3) = 0.01093, $p < 0.01$] significantly positive, confirming its delayed but vital role in growth. The model exhibited strong explanatory power ($R^2 = 0.999$, F-statistic = 1684.26, $p < 0.01$) and robustness (Durbin-Watson = 2.05; Jarque-Bera probability = 0.597). However, the ARDL bounds test (F-statistic = 1.785 < I0 bound = 2.45 at 10%) indicates no evidence of a long-run relationship among the variables. These findings suggest that exchange rate movements, inflation, and FDI influence Nigeria's growth largely in the short run, while long-run equilibrium remains absent. The study underscores the importance of exchange rate stability, inflation targeting, and policies that attract sustainable FDI to achieve resilient economic growth.

Keywords: Exchange rate fluctuations, economic growth, inflation, interest rate, foreign direct investment.

Introduction

Exchange rate fluctuation is defined as a series of changes in the value of the Nigerian Naira (NGN) as compared to the foreign currency like the U.S dollar (USD). These changes are mostly influenced by the variables such as the volatility of the global oil prices, inflationary forces, and dynamics of the foreign reserves since over 80% of Nigeria foreign exchange earnings come through crude oil (Uchechi and Iheukwumere, 2022). Instead, economic growth is gauged by changing the real Gross Domestic Product (GDP) annually as a percentage, which entails the productive capacity and general economic performance of the country (Ridhwan, Ismail & Nijkamp, 2024). The linkage of these two variables is complex. Although stable exchange rates increase predictability in trade and investment which in turn promotes growth, volatility tends to adversely affect macroeconomic stability by increasing the cost of imports, stimulating less investment and increasing uncertainty. Empirical evidence shows that an increase in the exchange rate volatility by 10 percent can cut the growth in about 0.2 to 0.5 percent (Olamide, Ogujiuba & Maredza, 2022).

Nigeria has recorded a long history of turbulence in its exchange rate regime since the implementation of the Structural Adjustment Program (SAP) in 1986 that had transformed the Naira to a flexible exchange rate regime. During the early 1980s, the exchange rate fell drastically as it dropped to 0.804/USD in 1990 after surging to

0.55/USD in 1980, just at the time when the GDP shrank at -13.1% in 1981 (Fofanah, 2022). Additional depreciation was experienced in the 1990s with Naira depreciating to ₦101.7/USD in 2000, and real GDP growth was up and down with an average of 2.3% (Akadiri & Akadiri, 2021). The relative stability of the 2000s (rate range ₦120150/USD), was induced by an oil boom, which sustained a growth of 7.8 percent in average GDP between 2000 and 2009, particularly when the world prices of crude oil reached 140 per barrel in 2008 (El Aboudi, Jouali, El Bakkouchi, and Echaoui, 2024). Nevertheless, the 20142016 oil crisis lowered the Naira to 305/USD, initiating a -1.6 percent GDP decline and bringing the inflation rate to 18.6 percent in 2016 (Rehman, 2024). Most recently, currency pressures were worsened by the COVID-19 pandemic. By 2022 and later to about 1,519/USD in 2025, the Naira had devalued to c. 700 USD, and the GDP declined by -1.8% in 2020 (Putra, Kurniawan, and Susanto, 2025).

There is an indication that during the years of 2015 to 2023, the growth was limited to 1.2 per cent in times of high exchange-rate volatility, as compared to 4.5 per cent in comparatively stable times (Ridhwan et al., 2024). Short-term depreciations are likely to provide marginal benefits (assessed as 0.5-1% GDP increment as a result of trade competitiveness) but long-term costs (cutting growth by 1-2 percent as a result of inflationary pass-through and distorted investments). This study therefore seeks to explore the impact of exchange rate fluctuations on Nigeria's economic growth, situating the analysis within the country's oil-dependent and import-reliant context, with the aim of providing policy insights for achieving sustainable and resilient growth.

Literature Review

Theoretical Review

Two theories serve as a guiding point in the analysis of the effect of exchange rate changes on economic growth on a Nigerian basis, namely the MundellFleming model and the Dutch Disease theory. MundellFleming model as an improvement of the IS-LM model of open economies assumes that at the flexible exchange rate, monetary policy plays a more efficient role in output and growth together with a reduced role of fiscal policy which is as a result of the adjustments in exchange rates that neutralize the trade imbalance, in the case of Nigeria, this would mean that the naira volatility triggered by oil price shocks and foreign reserve changes can either stimulate growth through export competitiveness during the depreciation process or constrain it through imported inflation and investment risk as has been the case with Complementary to this, the Dutch Disease theory explains how resource booms result in appreciation of currencies, undermining the competitiveness of non-resource sectors such as agriculture and manufacturing, thus suffocating diversified economic growth; in the case of oil-dependent Nigeria, the overvalued exchange rates during high oil price periods have historically worsened deindustrialization and unemployment, turning potential resource booms into drag on economic growth, a phenomenon reflected by the dependency coefficients between the exchange rate and the non-oil GDP growth. These theories combined together bring out the two-sided aspect of the dynamics of exchange rate in Nigeria and the necessity of policy structures that curb the volatility so that the growth potentials can be realized (Olawale, 2024).

Empirical Review

Over the last few years, there has been a proliferation of empirical literature on the effect of exchange rate changes on economic growth in Nigeria with the majority of studies using a variety of econometric methods to test the relationship. Such studies tend to emphasize that exchange rates volatility justifies the effects on the major macroeconomic variables, including gross domestic product (GDP), industrial output, balance of payment, and inflation, in the framework of the Nigerian economy, which is dependent on oil-based industries and characterized

by changes in policies. A mass of literature has recorded a largely adverse effect of exchange rate movements on economic growth, and often attributed this effect to increased uncertainty that impedes investment, international trade competitiveness and general macroeconomic stability. As an example, the study by Olawale (2024) applied a Multivariate Adaptive Regression Spline (MARS) model to data between 1960 and 2022 and discovered a negative relationship between the exchange rate volatility and GDP, which is not linear in nature and the variation in the GDP is explained by fluctuations as the most significant predictor compared to interest rates and imports. In a similar way, Ukangwa et al. (2024) used an Autoregressive Distributed Lag (ARDL) model on data 1990 to 2021, identifying a significant negative long-run impact on the GDP per capita and per capita income, with exchange rate changes increasing the unemployment and undermining the standards of living and correcting some 51% of the deviations each year by error correction mechanisms. In a cross-country panel investigation of African economies including Nigeria with fixed-effects models of 2000-2015 data, Niass (2019) attributed exchange rate appreciation due to natural resource booms to less diversification of exports, which in turn smothered growth indirectly through Dutch disease effects, with oil preeminence resulting in Naira overvaluation and declining agricultural sector. The studies are connected insofar as they focus on long-run structural vulnerability; nonlinear modeling of Olawale supplements the resource-channel orientation of Niass, whereas inclusion of unemployment in Ukangwa context brings together micro-level effects on welfare to aggregate growth which argument holds that volatility increases inequality in resource-dependent economies.

Building on this, Sikiru and Salisu (2025) employed a GARCH-MIDAS model on 2008-2023 data to identify drivers like high inflation, low interest rates, and dwindling oil prices as amplifiers of exchange rate variability, which in turn heightens long-term volatility persistence and undermines growth, recommending enhanced forex market efficiency and macroeconomic policy consistency. Relating these, both highlight volatility persistence—Sikiru and Salisu through mixed-frequency data handling, and the anonymous study via short/long-run dynamics—indicating that post-2000 oil booms exacerbated earlier patterns observed in the 1970s-2000s, with policy inconsistencies as a common thread. Equally, some studies report positive or insignificant effects, often in contexts where exchange rate movements boost export competitiveness or are offset by other factors. Amoo (2025) used an ARDL model on unspecified recent data and found a positive significant relationship between exchange rate and GDP (0.037% increase per unit change), though within a broader capital market framework where market capitalization negatively dominated. Ogodo and Egbaseimokumo (2025) similarly applied ARDL to 1986-2023 data, concluding that exchange rate and interest rates positively and significantly influence real GDP, with inflation insignificant, advocating for export promotion to leverage these effects. Bello et al. (2022) adopted an EGARCH model on 1986Q1-2019Q4 quarterly data, uncovering a positive asymmetric relationship with trade balance, industrial output, and inflation, where "good news" (appreciation) outweighed "bad news" in reducing volatility. These positive findings contrast with the negative group but relate through methodological overlaps; ARDL models in Amoo and Ogodo capture long-run equilibria, potentially masking volatility by not explicitly modeling heteroscedasticity as in Bello's GARCH variant, which still implies growth benefits from managed appreciation in open economies.

When thresholds are used or macroeconomic interactions are more comprehensive, mixed results are obtained, and this explains why Nigeria has a transitional policy environment. As an example, 2025 study of threshold effects (unspecified methods) reported that modeling of exchange rate volatility had a positive effect on growth within specified inflation and interest rates limits, using Nigerian data. That is reminiscent of the short-run positivity and long-run negativity of the anonymous study which implies temporal dynamics. A further study of the macroeconomic factors and the pricing of stocks (2025) observed that exchange rates had a positive influence on the

prices, which in turn supported growth through financial conduits. Sub-Saharan Africa including Nigeria IMF analyses of the region (2025) emphasized that exchange rate volatility capped reserves and growth in shallow markets. These mixed results relate to previous literature in which oil prices and inflation mediate, as discussed by Sikiru and Salisu, and the diversification lens as described by Niass, with short-term benefits (e.g., as with devaluation improving exports) of diversification giving way to costs in the long-run in undiversified economies. The patterns are further supported in studies that add sector-based understandings. In a capital market nexus study (2024) with VECM, exchange rate volatility was found to have the opposite effect on growth, with its association with oil shocks proving to be negative. Illicit flows (2024) has adjusted its exchange fluctuations in growth models, and the effect is negative in the indirect manner.

Methodology

Data Sources and Collection

This research is a quantitative research study where the secondary time series data will be used to examine how the exchange rate fluctuations affect the growth in the Nigerian economy. Data were obtained mostly through the World Development indicators (WDI, 2024), the Central Bank of Nigeria (CBN) Statistical Bulletin and the National Bureau of Statistics (NBS), between 1980 and 2023. Economic growth is measured by the help of Real Gross Domestic Product (RGDP) and exchange rate (EXR) is the explanatory variable. There are control variables like inflation rate (INF), interest rate (INT) and foreign direct investment (FDI) to explain the other macroeconomic factors.

Model Specification

The model specification is rooted in the neoclassical growth framework, extended to incorporate external sector variables. A log-linear functional form is adopted to stabilize variance and enable elasticity interpretation. The baseline model is expressed as:

Implicitly:

$$GDP_t = f(EXR_t, INF_t, INT_t, FDI_t, \mu_t)$$

In Econometrics form

$$GDP_t = \beta_0 + \beta_1 EXR_t + \beta_2 INF_t + \beta_3 INT_t + \beta_4 FDI_t + \mu_t$$

Logarithms form:

$$InGDP_t = \beta_0 + In\beta_1 EXR_t + In\beta_2 INF_t + In\beta_3 INT_t + In\,\beta_4 FDI_t + \mu_t$$

Where:

GDPt = Real Gross Domestic Product at time t (proxy for economic growth)

EXRt = Exchange Rate at time t (₦/USD)

INFt = Inflation Rate at time t (measured by Consumer Price Index)

INTt = Interest Rate at time t (proxied by Monetary Policy Rate)
FDIt = Foreign Direct Investment inflows at time t (as % of GDP)
μt = Stochastic error term capturing unobserved influences

A-Priori Expectation

Variable	Proxy/Measurement	Expected Sign
Exchange Rate (EXR)	Official exchange rate (₦/USD)	±
Inflation (INF)	Consumer Price Index (CPI, %)	–
Interest Rate (INT)	Monetary Policy Rate (%)	–
Trade Openness (TOP)	(Exports + Imports)/GDP (%)	+
Foreign Direct Investment (FDI)	Net inflows (% of GDP)	+
Real GDP (RGDP)	Log of Real GDP	Dependent Variable

Source: Author's computations (2025)

Estimation Techniques

To address both the short-run and long-run dynamics, the Autoregressive Distributed Lag (ARDL) bounds testing approach is employed, given its suitability for small sample sizes and for variables integrated of different orders (I(0) and I(1)). Unit root tests such as Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) are first conducted to ascertain the stationarity properties of the data. If cointegration is confirmed, the long-run coefficients are estimated, and an Error Correction Model (ECM) is specified to capture short-run adjustments. Diagnostic tests for autocorrelation, heteroskedasticity, normality, and model stability (CUSUM and CUSUMSQ) are also applied to ensure robustness of results.

Result and Discussion

Table 2: Unit Root Test Results Table

UNIT ROOT TEST RESULTS TABLE (ADF)						
Null Hypothesis: the variable has a unit root						
	At Level					
		LGDP	EXR	INF	INT	FDI
With Constant	t-Statistic	-0.8062	2.9720	-3.7282	-7.6706	-3.8214
	Prob.	***0.8062***	***1.0000***	***0.0072***	***0.0000***	***0.0055***
		n0	n0	***	***	***
With Constant & Trend	t-Statistic	-1.9193	-0.5252	-2.7928	-7.6779	-3.7834
	Prob.	***0.6244***	***0.9782***	***0.2090***	***0.0000***	***0.0274***
		n0	n0	n0	***	**
Without Constant & Trend	t-Statistic	2.8942	4.9299	-1.8707	-7.5329	-2.0800
	Prob.	***0.9987***	***1.0000***	***0.0592***	***0.0000***	***0.0374***
		n0	n0	*	***	**
	At First Difference					
		d(LGDP)	d(EXR)	d(INF)	d(INT)	d(FDI)
With Constant	t-Statistic	-3.4556	-4.2269	-3.0154	-4.0761	-10.0837

	Prob.	***0.0148***	***0.0018***	***0.0429***	***0.0034***	***0.0000***
		**	***	**	***	***
With Constant & Trend	t-Statistic	-3.2833	-4.9974	-2.9833	-4.0078	-10.0740
	Prob.	***0.0841***	***0.0012***	***0.1506***	***0.0186***	***0.0000***
		*	***	n0	**	***
Without Constant & Trend	t-Statistic	-1.1621	-3.4410	-3.0646	-4.0100	-10.2127
	Prob.	***0.2193***	***0.0010***	***0.0032***	***0.0002***	***0.0000***
		n0	***	***	***	***

Source: Author's computations (2025)

The unit root test results in Table 2 indicate that most of the variables are non-stationary at their levels but become stationary after first differencing. At level, GDP (LGDP) and exchange rate (EXR) are non-stationary across all specifications (constant, trend, and none), while inflation (INF), interest rate (INT), and foreign direct investment (FDI) show mixed results, being stationary only under some conditions. However, at first difference, all variables attain stationarity, as shown by the significance of their test statistics, particularly under the constant and the constant & trend assumptions. This implies that the variables are integrated of order one, I(1), meaning they become stationary only after first differencing. Such results justify the application of econometric techniques like the Autoregressive Distributed Lag (ARDL) model or Johansen cointegration test to capture both the short-run and long-run dynamics among the variables.

Table 3: Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.623458	103.4677	69.81889	0.0000
At most 1 *	0.554887	63.42194	47.85613	0.0009
At most 2 *	0.367835	30.23539	29.79707	0.0445
At most 3	0.232492	11.43262	15.49471	0.1862
At most 4	0.014137	0.583770	3.841466	0.4448

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.623458	40.04571	33.87687	0.0081
At most 1 *	0.554887	33.18655	27.58434	0.0086
At most 2	0.367835	18.80277	21.13162	0.1027
At most 3	0.232492	10.84885	14.26460	0.1619
At most 4	0.014137	0.583770	3.841466	0.4448

Source: Author's computations (2025)

The cointegration test results in Table 3, using both the Trace and Maximum Eigenvalue statistics, indicate the presence of long-run relationships among the variables. The Trace test rejects the null hypothesis of no cointegration up to three cointegrating equations, as the test statistics for "None," "At most 1," and "At most 2" are all greater than their critical values at the 5% level. Similarly, the Maximum Eigenvalue test confirms at least two cointegrating vectors, as the null of no cointegration and at most one cointegration equation are both rejected, while subsequent hypotheses are not significant. Taken together, the results suggest the existence of at least two cointegrating relationships among the variables, implying that despite being individually non-stationary, they move together in the long run.

Table 4: ARDL Test Result

Dependent Variable: LGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LGDP(-1)	0.780033	0.150631	5.178434	0.0001
LGDP(-2)	0.280718	0.196748	1.426788	0.1699
LGDP(-3)	0.214007	0.169848	1.259996	0.2229
LGDP(-4)	-0.399227	0.119044	-3.353599	0.0033
EXR	-0.000181	0.000101	-1.791059	0.0892
EXR(-1)	0.000347	0.000105	3.293143	0.0038
INF	-0.000382	0.000159	-2.407474	0.0264
INF(-1)	0.000697	0.000207	3.374861	0.0032
INF(-2)	-0.000796	0.000224	-3.562106	0.0021
INF(-3)	-0.000570	0.000217	-2.624752	0.0167
INT	0.000768	0.000276	2.783691	0.0118
INT(-1)	0.000555	0.000271	2.049314	0.0545
INT(-2)	-0.000424	0.000263	-1.616042	0.1226
INT(-3)	-0.000804	0.000257	-3.134987	0.0055
FDI	-0.009935	0.002797	-3.552238	0.0021
FDI(-1)	-4.31E-05	0.002720	-0.015849	0.9875
FDI(-2)	0.005757	0.002365	2.433737	0.0250
FDI(-3)	0.010933	0.002280	4.794281	0.0001
FDI(-4)	-0.003267	0.002412	-1.354241	0.1915
C	1.425738	0.311670	4.574509	0.0002

R-squared	0.999407	Mean dependent var	11.41573
Adjusted R-squared	0.998813	S.D. dependent var	0.230642
S.E. of regression	0.007945	Akaike info criterion	-6.525912
Sum squared resid	0.001199	Schwarz criterion	-5.672803
Log likelihood	147.2553	Hannan-Quinn criter.	-6.219824
F-statistic	1684.263	Durbin-Watson stat	2.056774

Prob(F-statistic)	0.000000

Source: Author's computations (2025)

The ARDL test results in Table 4 reveal that past values of GDP (LGDP) significantly influence its current level, as shown by the strong positive effect of LGDP(-1) and the negative impact of LGDP(-4), confirming persistence and adjustment dynamics in economic growth. Exchange rate (EXR) exerts a mixed effect: the contemporaneous value is negative but weakly significant, while its lag [EXR(-1)] has a significant positive impact, suggesting that exchange rate movements may initially disrupt growth but could promote adjustment and stability over time. Inflation (INF) also shows alternating positive and negative effects across different lags, highlighting its volatile and nonlinear influence on growth. Interest rate (INT) is mostly positive and significant, indicating that, to some extent, higher interest rates may stimulate investment or capital inflows, though the negative coefficient at lag three suggests potential adverse long-term effects. Foreign direct investment (FDI) has both negative and positive effects, with the contemporaneous and some lags being significantly negative, while later lags [FDI(-2) and FDI(-3)] are strongly positive, implying that FDI's contribution to growth materializes over time rather than immediately. The model has an excellent overall fit, with an R-squared of 0.999 and a highly significant F-statistic, indicating strong explanatory power. The Durbin-Watson statistic (2.05) suggests no serious autocorrelation problem, further confirming the robustness of the estimates.

Table 5: ARDL Bounds Test

ARDL Bounds Test

Test Statistic	Value	k
F-statistic	1.785155	4

Critical Value Bounds

Significance	I0 Bound	I1 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 computations 2025

The outcome of the ARDL bounds test indicates that the F- statistic value is 1.785, which falls short of the lower values of the critical levels at all the levels of significance (I0 = 2.45 at 10, 2.86 at 5, 3.25 at 2.5 and 3.74 at 1). The lower bound is below the calculated F-statistic; therefore, the null hypothesis that there is no long-run relationship can not be rejected. This means that cointegration among the variables in the model does not exist in the ARDL framework. That is, although the variables can have short-run dynamics, they are not related by a steady long-run equilibrium with this test.

Table 6: Stability Test

Ramsey RESET Test

	Value	df	Probability
t-statistic	1.864735	18	0.0786
F-statistic	3.477235	(1, 18)	0.0786

F-test summary:

	Sum of Sq.	df	Mean Squares
Test SSR	0.000194	1	0.000194
Restricted SSR	0.001199	19	6.31E-05
Unrestricted SSR	0.001005	18	5.58E-05

Source: Author's computations (2025)

The Ramsey RESET test result shows that both the t-statistic (1.8647) and the F-statistic (3.4772) have a probability value of 0.0786, which is greater than the 5% significance level but less than 10%. This implies that at the 5% level, the null hypothesis of no model misspecification cannot be rejected, suggesting that the model is adequately specified. However, at the more lenient 10% level, there is weak evidence of possible misspecification. Overall, the test indicates that the model does not suffer from serious functional form problems, though some caution is advised in interpreting the results since the p-value is close to the 10% threshold.

Normality Test

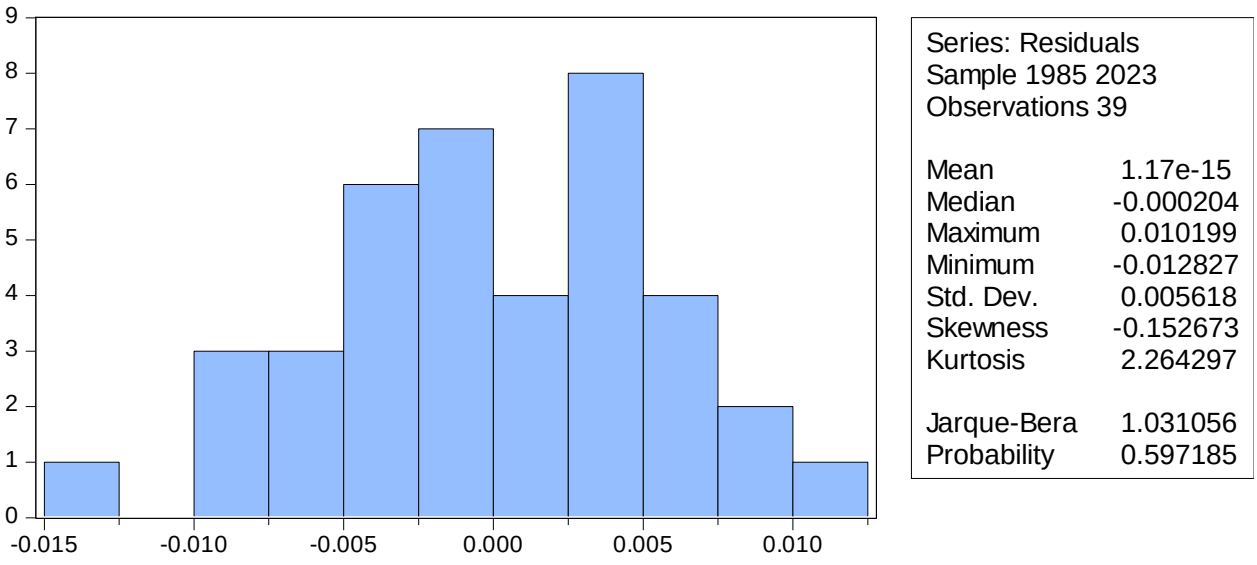

Figure 1: Normality test

Source: Author's computations (2025)

The residual diagnostic results indicate that the model errors are well-behaved and satisfy the normality assumption. The mean (1.17e–15) and median (–0.000204) are very close to zero, while the skewness (–0.1527) shows only slight negative asymmetry, suggesting a nearly symmetric distribution of residuals. The kurtosis value of 2.26 is close to the normal benchmark of 3, implying only a slightly flatter distribution. The Jarque–Bera statistic (1.031) with a probability value of 0.597 exceeds the 5% significance level, leading to a failure to reject the null hypothesis of normality. Together with the histogram that appears bell-shaped, these results confirm that the residuals are normally distributed, with no evidence of outliers or systematic bias, thereby supporting the robustness and reliability of the ARDL model estimates

Discussion

Based on the results of the ARDL (Table 4), it can be seen that the economic development in Nigeria is highly path-dependent with the positive effect of LGDP (-1) significant and negative coefficient of LGDP (-4) showing that there are both persistence and correction mechanisms in economic growth. Exchange rate fluctuations have mixed impacts, the contemporaneous exchange rate is negative but weakly significant and lagged effect [EXR (-1)] is positive and significant, which means that the short-term depreciation can cause disruption of growth at first but adjustment processes in later periods can create stability. This result aligns with the results of Uchechi and Iheukwumere (2022), who have found that exchange rate shocks lower the growth in the short-run, but may lead to higher competitiveness over time. Nonetheless, it opposes the finding by Fofanah (2022), who established recurring negative impacts of exchange rate volatility on the economies of West Africa, which implies that the adjustment of Nigeria can be rather robust as it allows its economy to be supported by oil-related revenues. Inflation is non-linear and the signs between lags are alternating as it is unstable in its contribution to growth. This is in line with Olamide et al. (2022), who noted that both inflation and exchange rates have an asymmetric impact on growth in developing nations. On the same note, Rehman (2024) observed the destabilizing nature of inflation on the growth path of Pakistan. The coefficients of interest rates are positive and significant with few exceptions implying that higher rates can stimulate capital inflows and investment in the short term, but negative lagged effect is an indication of potential crowding-out in the long run. This is dualistic, which can be compared to the research by El Aboudi et al. (2024), which emphasized the multifaceted nature of interest rates and inflation and growth under the VAR modeling.

Foreign direct investment (FDI) has both immediate negative and delayed positive effects, with significant gains materializing after two to three lags, implying that the benefits of FDI in Nigeria are realized in the medium term. This supports Putra et al. (2025), who emphasized that FDI's growth effects in ASEAN countries are more pronounced over longer horizons. The diagnostic statistics reinforce the model's robustness, with an R-squared of 0.999, highly significant F-statistic, and a Durbin–Watson statistic (2.05) indicating no autocorrelation problem. Despite these strong short-run dynamics, the ARDL bounds test shows an F-statistic (1.785) below the lower bound at all significance levels, implying the absence of a long-run cointegrating relationship among the variables. This result suggests that while exchange rate, inflation, interest rate, and FDI significantly shape Nigeria's short-run growth fluctuations, they do not jointly sustain a stable long-run equilibrium. This finding contrasts with Ridhwan et al. (2024), who, through a meta-analysis, found robust long-run links between real exchange rates and growth across multiple countries. The absence of long-run cointegration in Nigeria may therefore reflect its heavy dependence on

oil exports, frequent policy shifts, and structural vulnerabilities that prevent stabilization in the macroeconomic environment.

Conclusion

The article investigated how exchange rate fluctuations had an effect on the economic growth of Nigeria through the ARDL model. The findings showed that the historical levels of GDP have a major impact on the current performance of the economy, which suggests the existence of growth dynamics. There was a mixed effect on the exchange rate movements, which were negative in the short run but positive with lags, implying that it will disrupt initially and then gradually adapt to the situation. Inflation had positive effects on the various lags both with positive and negative tendencies, which are dynamic, and interest rates were generally positive which indicated that moderate increases can lead to growth in terms of capital inflows though there are long term negative consequences. Later lags also saw positive growth in the contribution of foreign direct investment (FDI), making it true that it plays a delayed but critical role in economic development. Nevertheless, the ARDL bounds test showed that there was no evidence of a long-run equilibrium relationship between the variables, which shows that their interactions are mainly short-term relationship. The diagnostic outcome of the residue validated that the model is not weak and the residues are normally distributed with no autocorrelation.

Recommendations

The recommendations are as follows;

1. Exchange rate Stability: To reduce excessive exchange rate volatility policymakers must adopt strategies that will see them increase foreign reserves, diversify export base and stimulate non-oil exports in order to reduce short-term shocks and improve the long-term growth opportunities.
2. Inflation Management: Inflation did not have a consistent impact on growth hence the monetary authorities should embrace balanced inflation-targeting mechanism that neither impacts inflation nor smothers investment and output growth.
3. Interest Rate Policy: Interests must be controlled in order to balance between bringing foreign capital and keeping its domestic investments without using very high rates which might deter long term economic growth.
4. FDI Promotion: The policies made should aim at enhancing a good climate of investment by enhancing the infrastructure, governance and policy consistency since the effect of FDI increases with time.
5. Economic Diversification: Diversification of Nigeria economy in terms of manufacturing, agriculture, and technological products would assist in cushioning the economy against external shocks and exchange rate pressure.
6. Enhanced Institutions: Enhanced macroeconomic stability and increased investor confidence will be achieved through stronger financial and economic institutions which will contribute to long term sustainable growth.

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