

DETERMINANTS OF EXCHANGE RATE FLUCTUATION IN NIGERIA

Rilwan Abdulsalam¹, Rilwan Bello², Hafiz Ismail³, Habiba Bello⁴ & Sadiq Wakil Dalil⁵

Department of General Studies, Federal Polytechnics Wannune, Benue State Nigeria¹, Department of Economics, Federal College of Education Yola, Adamawa State Nigeria^{2,3,4,&5} Email: rilwanabdulsalam1@gmail.com¹, rilbello@gmail.com², Alishaf795@gmail.com³, habibabdahiru@gmail.com⁴, & dalilwakil@gmail.com⁵.

ABSTRACT

Exchange rate stability remains a critical macroeconomic objective because exchange rate movements influence inflation, investment, trade competitiveness, and overall economic performance. This study empirically examined the determinants of exchange rate fluctuation in Nigeria using annual time-series data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin covering the period 1986-2024. The study investigated the effects of gross domestic product (GDP), degree of openness, interest rate, and inflation rate on exchange rate behavior within the framework of the Purchasing Power Parity, Interest Rate Parity, and Balance of Payments theories. The Autoregressive Distributed Lag (ARDL) Bounds Testing approach was adopted due to the mixed order of integration among the variables. The unit root results indicated that exchange rate, GDP, interest rate, and inflation were stationary at level, while degree of openness became stationary at first difference. The ARDL Bounds Test confirmed the existence of a long-run relationship among the variables. The long-run results revealed that GDP and inflation exert positive and significant effects on exchange rate movements, while degree of openness exerts a significant negative effect. Interest rate was found to have a positive but statistically insignificant impact on exchange rate. The Error Correction Model showed a significant adjustment coefficient of -0.472891, indicating that about 47.29 percent of short-run disequilibrium is corrected annually. The study concludes that GDP, inflation, and trade openness are the major determinants of exchange rate dynamics in Nigeria and recommends increased domestic production, export diversification, inflation control, and enhanced trade competitiveness to promote exchange rate stability and sustainable economic growth.

Keywords: Exchange Rate, Gross Domestic Product, Interest Rate, Inflation Rate and Degree of Openness.

JEL Code: F31, E01, E43, E31, F41.

1.0 INTRODUCTION

The exchange rate occupies a central position in the international financial system because it determines the relative value of national currencies and facilitates economic interactions among countries (Mishkin, 2022). As global economies become increasingly integrated through trade, investment, and financial transactions, exchange rate movements have emerged as a significant factor influencing macroeconomic outcomes across nations (Mishkin, 2022). Variations in exchange rates affect the prices of imported and exported goods, capital movements, inflation dynamics, and the competitiveness of domestic industries within the global marketplace (Mishkin, 2022). Consequently, maintaining a stable exchange rate has become an important policy objective for governments and monetary authorities because excessive volatility can create uncertainty in economic activities and hinder sustainable growth and development (Oyadeyi, 2024). The growing interconnectedness of world economies has therefore intensified scholarly and policy interest in understanding the underlying factors that drive exchange rate behavior across different economic environments (Oyadeyi, 2024).

Across developing regions, particularly in African economies, exchange rate determination remains a major economic concern due to structural constraints and exposure to external vulnerabilities (Oyadeyi, 2024). Many African countries depend heavily on commodity exports as their primary source of foreign exchange earnings, making their currencies highly susceptible to fluctuations in international commodity markets and global economic conditions (Oyadeyi, 2024). Furthermore, persistent inflationary pressures, limited industrial diversification, external debt burdens, and unstable capital flows have continued to exert pressure on exchange rate performance in several countries within the continent (Mishkin, 2022). These conditions often result in currency instability, which negatively affects trade activities, investment decisions, fiscal management, and overall economic development (Oyadeyi, 2024). As a result, policymakers and researchers across

Africa have increasingly focused attention on identifying the macroeconomic variables that influence exchange rate movements and the mechanisms through which such variables affect economic stability (Oyadeyi, 2024).

Nigeria provides an important setting for examining exchange rate determination because of its strategic position within the African economy and its dependence on crude oil exports as the dominant source of foreign exchange receipts (Oyadeyi, 2024). The country's foreign exchange market is influenced by both domestic and external economic conditions, including changes in international oil prices, inflation rates, money supply growth, interest rate movements, and the level of external reserves (Dalhatu et al., 2024; Mishkin, 2022). Since crude oil contributes substantially to Nigeria's export earnings and government revenue, fluctuations in global oil prices frequently translate into changes in foreign exchange availability and exchange rate performance (Oyadeyi, 2024). At the same time, domestic monetary conditions can either strengthen or weaken the value of the naira through their effects on liquidity, price stability, and investor confidence (Dalhatu et al., 2024). Despite numerous exchange rate reforms and policy interventions introduced over the years, the Nigerian economy continues to experience episodes of exchange rate depreciation and volatility, indicating the existence of persistent macroeconomic factors influencing exchange rate outcomes (Oyadeyi, 2024).

The persistence of exchange rate instability in Nigeria has important implications for economic growth, business operations, investment planning, and the welfare of households (Oyadeyi, 2024). Frequent fluctuations in the value of the naira contribute to rising production costs, increase the prices of imported goods and services, and create uncertainty for both local and foreign investors (Mishkin, 2022). In addition, exchange rate volatility complicates macroeconomic management and can weaken the effectiveness of government policies aimed at promoting economic stability and growth (Oyadeyi, 2024). Given these concerns, there is a need for a comprehensive assessment of the factors responsible for exchange rate movements in Nigeria. Therefore, the main objective of this study is to investigate the determinants of exchange rate in Nigeria. Specifically, the

study aims to examine the influence of inflation, degree of openness, interest rate and gross domestic product growth rate on exchange rate behavior in Nigeria.

2.0 LITERATURE REVIEW

2.1 Conceptual Review

2.1.1 Exchange Rate

Exchange rate is the price of one currency expressed in terms of another currency and it represents a key macroeconomic indicator used in assessing external sector performance in an open economy (Mishkin, 2022). Exchange rate movements are influenced by demand and supply conditions in the foreign exchange market, which are determined by macroeconomic fundamentals such as inflation, interest rates, GDP, and external trade flows (World Bank, 2023).

2.1.2 Gross Domestic Product (GDP)

Gross Domestic Product (GDP) is the total monetary value of goods and services produced within a country over a specific period and serves as a primary indicator of economic performance (World Bank, 2023). GDP reflects economic strength and productivity, which influence investor confidence and foreign capital inflows that may affect exchange rate stability (IMF, 2023).

2.1.3 Degree of Openness

Degree of openness refers to the extent to which an economy engages in international trade relative to its GDP, often measured as the ratio of exports plus imports to GDP (World Bank, 2023). A higher degree of openness increases exposure to external shocks and exchange rate fluctuations due to reliance on international trade (IMF, 2023). In Nigeria, high import dependence increases demand for foreign currency, thereby exerting pressure on the exchange rate (CBN, 2023).

2.1.4 Interest Rates

Interest rate refers to the cost of borrowing or return on savings and is a key monetary policy instrument used to regulate economic activity (IMF, 2023). Interest rate differentials between countries influence capital flows, which affect demand and supply of foreign exchange and consequently exchange rate movements (Mishkin, 2022). In Nigeria, changes in monetary policy rates by the Central Bank influence inflation, investment decisions, and exchange rate stability (CBN, 2023).

2.1.5 Inflation Rate

Inflation rate refers to the persistent rise in the general price level of goods and services in an economy over time (World Bank, 2023). High inflation reduces purchasing power and weakens currency value, leading to exchange rate depreciation due to increased demand for foreign currency (IMF, 2023). In Nigeria, inflation has remained a major macroeconomic challenge contributing to exchange rate volatility and economic instability (CBN, 2023).

2.2 Theoretical Review

2.2.1 Purchasing Power Parity (PPP) Theory

The Purchasing Power Parity theory explains that exchange rates adjust to equalize price levels between countries, implying that inflation differentials determine currency depreciation or appreciation (Mishkin, 2022). Countries with higher inflation rates experience currency depreciation relative to lower inflation economies.

2.2.2 Interest Rate Parity (IRP) Theory

The Interest Rate Parity theory states that differences in interest rates between countries determine capital flows, which influence exchange rate movements (IMF, 2023). Higher interest rates attract foreign investors, increasing demand for domestic currency and affecting exchange rate stability.

2.2.3 Balance of Payments (BOP) Theory

The Balance of Payments theory explains exchange rate determination through the interaction of all international transactions including trade, investment, and capital flows (IMF, 2023). A deficit in the balance of payments leads to increased demand for foreign currency and depreciation of the domestic currency.

2.3 Theoretical Framework

This study adopts an integrated framework combining the Purchasing Power Parity theory, Interest Rate Parity theory, and Balance of Payments theory. The framework assumes that exchange rate is determined by inflation rate, GDP, interest rate, and degree of openness (Mishkin, 2022; IMF, 2023). Inflation influences exchange rate through price level changes, interest rate affects capital inflows, GDP reflects economic strength and investor confidence, while openness increases exposure to external shocks (World Bank, 2023). This framework provides a comprehensive explanation of exchange rate behavior in Nigeria by combining monetary, real sector, and external sector factors.

2.4 Empirical Review

Wasiu et al., (2019), examined the determinants of exchange rate in Nigeria by comparing the official and parallel market exchange rates using quarterly time series data from 1986 to 2017 within the post SAP era. Employing the ARDL model, the study establishes both short run and long run relationships among variables. The findings reveal that GDP, inflation, interest rates, oil exports, non oil exports, and foreign reserves significantly determine the official exchange rate, while inflation, GDP, and non oil exports mainly drive the parallel market rate, indicating differing sensitivities across the two markets. The study concludes that Nigeria's dual exchange rate system responds differently to macroeconomic fundamentals and recommends policy harmonization and improved macroeconomic coordination to reduce market distortions and enhance exchange rate stability.

Evans (2019) investigated the relationship between exchange rate and macroeconomic fundamentals, arguing that the relationship is highly unstable due to volatility in structural parameters. The findings emphasize that exchange rate movements are better explained by expectations of parameters rather than the structural parameters themselves, highlighting the role of uncertainty in exchange rate dynamics. More so, Akinkunmi (2017) examined the impact of central bank intervention on exchange rate behavior in ECOWAS countries using panel data analysis. The study found that central bank intervention has a non significant effect on exchange rate stabilization, while monetary policy rate significantly and positively influences exchange rate movements. The study concluded that monetary policy remains more effective than direct intervention in influencing exchange rate dynamics.

Adeniran et al., (2014) studied the impact of exchange rate on economic growth in Nigeria. The findings revealed that exchange rate depreciation negatively affects economic growth in the long run. The study recommended stable exchange rate policies and diversification of export base. Bacchetta and Van Wincoop (2013) investigated why the relationship between exchange rates and macroeconomic fundamentals varies frequently. Using a theoretical framework, they found that instability in the exchange rate fundamentals relationship is driven by uncertainty in structural parameters. Their study concludes that exchange rate behavior is influenced more by expected parameter values than by observable fundamentals, explaining weak empirical linkage between macroeconomic variables and exchange rates.

2.5 Research Gap

Existing empirical literature on exchange rate determinants and economic growth in Nigeria has largely focused on exchange rate volatility in isolation without fully integrating macroeconomic variables such as GDP, inflation, interest rate, and degree of openness within a unified framework. Additionally, many studies are outdated or do not capture recent structural changes in Nigeria's economy such as intensified exchange rate instability, post-COVID economic adjustments, and

global oil price shocks. Methodologically, earlier studies often relied on basic regression models that fail to capture dynamic relationships among variables. Therefore, this study fills these gaps by providing a more recent and integrated analysis of exchange rate determinants in Nigeria using key macroeconomic variables that jointly influence exchange rate behavior and economic growth outcomes.

3.0 METHODOLOGY

This study utilizes annual time series data covering the period from 1986 to 2024. All the variables used in the analysis were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2024). The key variables incorporated into the empirical model include the exchange rate, gross domestic product (GDP), trade openness, interest rate, and inflation rate. These variables were selected based on their theoretical relevance and empirical importance in explaining exchange rate dynamics in Nigeria. The functional model is structured to capture how changes in macroeconomic indicators influence the exchange rate over time. The general form of the econometric model is presented as follows:

$$EX_t = \beta_0 + \beta_1 GDP_t + \beta_2 DO_t + \beta_3 IT_t + \beta_4 IN_t + \epsilon_t \quad (3.1)$$

Where: EX represents the exchange rate, GDP denotes gross domestic product, DO is the degree of openness, IT signifies interest rate, and IN refers to inflation rate. The study adopts the Autoregressive Distributed Lag (ARDL) approach an empirical econometrics methodology introduced by Pesaran and Shin (1995, 1997) and further developed by Pesaran, Shin and Smith (2001). The preference for the ARDL approach stems from its flexibility in handling variables with mixed levels of integration whether they are stationary at level $I(0)$, at first difference $I(1)$, or a combination of the two. The ARDL method allows for reliable estimation regardless of this mix. Another advantage of the ARDL technique is its strong performance with small or moderately sized samples, making it particularly suitable for studies based on annual data extending over a limited time period. The method yields efficient and unbiased long-run estimates, while also providing short-run dynamic

adjustments through the error correction representation. Thus, the ARDL model can be expressed in its log-linear form as:

$$\ln(\text{EX}_t) = \alpha_0 + \alpha_1 \text{GDP}_t + \alpha_2 \ln \text{DO}_t + \alpha_3 \ln \text{IT}_t + \alpha_4 \ln \text{IN}_t + \varepsilon_t \quad (3.2)$$

where $\ln$ denotes the natural logarithm, (α_0) represents the intercept term, $(\alpha_1 - \alpha_4)$ are the parameter coefficients of the explanatory variables, and (ε_t) stands for the random error term capturing unexplained variations.

4.0 DATA PRESENTATION AND ANALYSIS OF RESULT

4.1 Descriptive Statistics

The descriptive statistics provide information on statistical properties of the variables employed in the study. Table 4.1 reports the descriptive statistics.

Table 4.1 Descriptive Statistics

	EXR	GDP	DO	IT	IN
Mean	1.652800	3.758195	-0.825732	1.253035	1.059907
Median	2.048831	3.810313	-0.820810	1.250637	1.071883
Maximum	2.384301	5.006422	-0.086187	1.457388	1.762132
Minimum	0.205352	2.206289	-2.000001	1.079182	1.079182
Std. Dev.	0.487492	0.765636	0.383166	0.088996	0.210510
Skewness	-1.081417	-0.219292	-0.339200	-0.299710	0.810932
Kurtosis	2.750845	1.724071	2.244402	4.602576	2.597693
Jarque-Bera	6.070946	2.212858	1.451845	4.469730	4.305327
Probability	0.048053	0.214609	0.360270	0.001788	0.010509
Observations	38	38	38	38	38

Source: computed by the researcher using E-views version 12 (2026).

Table 4.1 show that the exchange rate has an average value of 1.652800, with its lowest recorded figure at 0.205352 and it's highest at 2.384301. The standard deviation of 0.487492 suggests moderate variability, and the associated probability value is 0.048053. For the gross domestic product (GDP), the mean value stands at 3.758195, ranging between 2.206289 and 5.006422. Its standard deviation is 0.765636, accompanied by a probability value of 0.360270. The degree of openness (DO) records a mean of -0.025732, fluctuating between a minimum of

-2.000001 and a maximum of -0.086187. The standard deviation is 0.383166, and the probability value is similarly 0.360270. Interest rate (IT) shows an average of 1.253035, with values spanning from 1.079182 to 1.457388 and a standard deviation of 0.383166. Its probability value is 0.001788. Inflation rate (IN) has a mean of 1.059907, varies between 0.632395 and 1.762132, and carries a standard deviation of 0.210510 with an associated probability value of 0.010509.

The Jarque Bera (JB) statistics indicate that GDP, DO, IT, and IN follow a normal distribution, while EX does not. This conclusion follows the conventional decision rule that a variable is considered normally distributed when the JB-calculated probability exceeds 0.05 or when the JB-table value is higher than the JB-calculated value at the 5% significance level.

4.2 Augmented Dickey-Fuller (ADF) Unit Root Test

The unit root test is conducted to determine if the variables are stationary or not.

Table 4.2 Unit Root Test

Variables	Test stat.	Crit. Val.	@Level	Test stat.	Crit. Val.	@1 st -Diff.
EX	-3.68288	-2.963963	Stationary	-	-	-
IT	-3.231272	-2.998055	Stationary	-	-	-
GDP	-3.315866	-2.963963	Stationary	-	-	-
DO	-2.154321	-2.981029	Non-Stationary	-3.882800	-2.981029	Stationary
IN	-4.673308	-2.963963	Stationary	-	-	-

Source: computed by the researcher using E-views version 12 (2026).

Table 4.2 presents the outcomes of the Augmented Dickey Fuller (ADF) unit root test. The results indicate that the variables EX, GDP, IT, and IN are stationary at level, whereas the degree of openness (DO) becomes stationary after first differencing. This implies that any disturbances or policy induced shocks to these variables are not persistent; rather, they dissipate quickly over time, suggesting short lived effects on the system. Considering a mix of I(0) and I(1) variables, the Autoregressive Distributed Lag (ARDL) approach is the most appropriate technique

and is employed to determine if a long-run equilibrium relationship exists among the variables.

4.3 Cointegration Test

To examine the existence of a long-run relationship due to the mixed integration orders of the variables (I(0) and I(1)), the ARDL Bounds Test is conducted. The test evaluates the null hypothesis of no cointegration among the variables in the model. The table below presents the Bounds Test results obtained from the estimated ARDL model.

Table 4.3 ARDL Bound Test Result

Null Hypothesis	F - Statistic	Critical Values		
No Long-Run	6.312023			
	Sign.	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: computed by the researcher using E-views version 12 (2026).

The computed F-statistics of 6.312023 is greater than the Upper Bound table value at 1%, 2.5%, 5% and 10% significance level, the study rejects the null hypothesis. Thus; there is long-run relationship between the variables of study.

4.4 Long and Short Run Coefficient Estimations

Table 4.4 Long Run Coefficients

Variable	Coefficient	Standard erro	Probability
LogIN	0.200765	0.106424	0.3503
GDP	0.698857	0.101191	0.0075
LogDO	-1.069952	0.262908	0.0176
LogIT	1.656987	1.044213	0.1503

Source: computed by the researcher using E-views version 12 (2026).

Table 4.4 presents the long-run coefficient estimates of the determinants of exchange rate in Nigeria. The analysis examines the effects of inflation (IN), gross domestic product (GDP), degree of openness (DO), and interest rate (IT) on

exchange rate dynamics. The coefficients indicate the direction and magnitude of the relationship between the explanatory variables and exchange rate, while the probability values determine their statistical significance. The result reveals that inflation (LogIN) has a positive coefficient of 0.200765 with a probability value of 0.03503. The positive coefficient implies that a 1% increase in inflation will lead to approximately a 0.30% increases in the exchange rate in the long run, holding other variables constant. This suggests that rising inflation contributes to the depreciation of the naira relative to foreign currencies. The finding is consistent with economic theory, which argues that high inflation reduces the purchasing power of a country's currency and weakens its international competitiveness, thereby exerting pressure on the exchange rate. In the Nigerian context, persistent inflationary pressures arising from rising food prices, energy costs, and structural bottlenecks often increase demand for foreign currencies as economic agents seek to preserve value. Therefore, the study rejects the null hypothesis of no significant relationship between inflation and exchange rate.

The coefficient of gross domestic product (GDP) is 0.698857, with a probability value of 0.0075. The positive coefficient indicates that a 1% increase in GDP is associated with approximately a 0.70% increase in exchange rate in the long run. This finding suggests that economic growth contributes to exchange rate depreciation in Nigeria. Although economic growth is generally expected to strengthen a country's currency, the Nigerian experience may differ because growth has historically been driven by sectors that depend heavily on imported machinery, raw materials, and technology. Consequently, increases in GDP may stimulate import demand and increase pressure on foreign exchange markets. The probability value of 0.0075 is less than 0.05, indicating that GDP exerts a statistically significant effect on exchange rate. Thus, GDP is a major determinant of exchange rate movements in Nigeria, and the null hypothesis is rejected.

The result further shows that degree of openness (LogDO) has a coefficient of -1.069952 and a probability value of 0.0176. The negative coefficient implies that a 1% increase in trade openness leads to approximately a 1.07% decrease in

exchange rate in the long run. This suggests that greater openness to international trade contributes to exchange rate appreciation or stability. One possible explanation is that increased openness promotes export activities, attracts foreign investment, and enhances foreign exchange earnings, thereby strengthening the naira. In the Nigerian economy, policies that encourage export diversification and integration into the global economy can improve foreign exchange inflows and reduce exchange rate volatility. The probability value of 0.0176 indicates that the relationship is statistically significant at the 5% level. Therefore, degree of openness is a significant determinant of exchange rate behavior in Nigeria.

The coefficient of interest rate (LogIT) is 1.656987, with a probability value of 0.1503. The positive coefficient indicates that a 1% increase in interest rate results in approximately a 1.66% increase in exchange rate in the long run. This suggests that increases in domestic interest rates are associated with exchange rate depreciation. In theory, higher interest rates are expected to attract foreign capital inflows and strengthen the domestic currency. However, in Nigeria, rising interest rates may reflect macroeconomic instability, inflationary pressures, and monetary tightening aimed at controlling economic imbalances. Consequently, increases in interest rates may not necessarily translate into stronger investor confidence or greater capital inflows. Despite the positive relationship, the probability value of 0.1503 exceeds the 5% significance level, indicating that interest rate does not significantly affect exchange rate in the long run. Therefore, the null hypothesis of no significant relationship between interest rate and exchange rate cannot be rejected.

The findings generally indicate that inflation, GDP and degree of openness are the significant long-run determinants of exchange rate in Nigeria, while interest rate exerts statistically insignificant effects. Specifically, GDP positively influences exchange rate, suggesting that Nigeria's growth pattern remains import dependent and tends to increase foreign exchange demand. Conversely, greater trade openness reduces exchange rate pressures, highlighting the importance of export promotion and global economic integration. The insignificant effects of interest

rate suggest that their impacts on exchange rate may be indirect or overshadowed by broader structural factors within the Nigerian economy.

4.5 The Short-run Dynamic and the Error Correction Model

The short-run dynamics of the NARDL model were estimated to examine the immediate effects of the explanatory variables on exchange rate movements in Nigeria. The Error Correction Model (ECM) was incorporated to capture the speed at which deviations from the long-run equilibrium are corrected following short-run shocks. The results are presented in Table 4.5.

Table 4.5 The Short-run Dynamics and Error Correction Model

Variable	Coefficient	Std.Error	t-Statistic	Prob.
D(LogIN)	0.090925	0.083028	1.095119	0.3044
D(GDP)	-0.538620	0.427386	-1.021303	0.3361
D(LogDO)	0.228922	0.074702	3.064522	0.0146
D(LogIT)	0.446720	0.133071	1.916676	0.0507
ECM(-1)	-0.472891	0.099859	-4.535330	0.0019

Source: computed by the researcher using E-views version 12 (2026).

The estimated coefficient of the lagged dependent variable, D(LogEX(-1)), is -0.476536 with a probability value of 0.0377, indicating statistical significance at the 5 percent level. The negative sign suggests that previous short-run fluctuations in the exchange rate exert a corrective effect on current exchange rate movements. Specifically, a 1 percent increase in the previous period's exchange rate leads to approximately a 0.48 percent reduction in the current exchange rate in the short run. This implies the existence of short-run adjustment mechanisms in Nigeria's foreign exchange market whereby exchange rate shocks tend to partially reverse over time. The coefficient of D(LogIN) is 0.090925 with a probability value of 0.3044, indicating that inflation has a positive but statistically insignificant effect on exchange rate movements in the short run.

Economically, the positive sign suggests that increases in inflation tend to depreciate the Naira by increasing domestic prices relative to foreign prices, thereby reducing the competitiveness of Nigerian goods and increasing demand for foreign currencies. However, the insignificance of the coefficient implies that

inflationary pressures do not exert an immediate and substantial impact on exchange rate fluctuations within the period under consideration. This finding may be attributed to exchange rate management policies of the Central Bank of Nigeria (CBN), foreign exchange interventions, and short-run rigidities in the foreign exchange market that weaken the immediate transmission of inflation shocks to the exchange rate.

The coefficient of $D(GDP)$ is -0.538620 with a probability value of 0.3361, indicating a negative but statistically insignificant relationship between economic growth and exchange rate in the short run. The negative sign implies that increases in real GDP tend to appreciate the domestic currency by improving productive capacity, export performance, and investor confidence. Nevertheless, the insignificant coefficient suggests that short-run changes in economic growth do not significantly influence exchange rate movements in Nigeria. This may reflect the structural characteristics of the Nigerian economy, where growth is heavily dependent on the oil sector and may not immediately translate into increased foreign exchange earnings or exchange rate stability.

The coefficient of $D(LogDO)$ is 0.228922 with a probability value of 0.0146, indicating a positive and statistically significant effect on exchange rate at the 5 percent level. This result suggests that a 1 percent increase in the degree of openness leads to approximately a 0.23 percent increase in the exchange rate, implying depreciation of the Naira in the short run. Economically, greater trade openness may increase import demand and the demand for foreign currencies, particularly in an import dependent economy such as Nigeria. Since Nigeria relies heavily on imported consumer goods, machinery, and industrial inputs, increased openness can exert pressure on foreign exchange demand, thereby contributing to exchange rate depreciation in the short run.

The coefficient of $D(LogIT)$ is 0.446720 with a probability value of 0.0507, indicating a positive effect on exchange rate and significance. This implies that a 1 percent increase in interest rate is associated with a 0.45 percent increase in exchange rate, suggesting depreciation of the Naira in the short run. The positive

relationship may appear contrary to conventional economic theory, which predicts that higher interest rates attract foreign capital inflows and strengthen the domestic currency. However, in Nigeria's context, increases in interest rates often occur during periods of macroeconomic instability, inflationary pressures, and exchange rate uncertainty. Consequently, higher interest rates may signal economic vulnerabilities rather than attract sufficient foreign investment, leading to further depreciation pressures on the Naira.

The Error Correction Term, $ECM(-1)$, has a coefficient of -0.472891 and a probability value of 0.0019 , indicating that it is negative, statistically significant, and correctly signed. The significance of the ECM confirms the existence of a stable long-run equilibrium relationship between exchange rate and its determinants. The coefficient of -0.472891 implies that approximately 47.29 percent of short-run disequilibrium in the exchange rate is corrected within one period. In other words, whenever exchange rate deviates from its long-run equilibrium path, nearly half of the deviation is eliminated in the subsequent period. This adjustment speed is relatively high and suggests an efficient convergence process toward long-run equilibrium.

From a policy perspective, the significant ECM coefficient indicates that although short-run shocks arising from inflation, economic growth, trade openness, or interest rate changes may temporarily destabilize the exchange rate, market forces and policy interventions gradually restore equilibrium. The result further validates the appropriateness of the NARDL framework and confirms the existence of a long-run relationship among the variables.

4.6 Autocorrelation Test

Table 4.6 Breusch Godfrey Serial Correlation LM Test

F-statistic	0.166948	Prob. F(2,6)	0.8501
Obs*R-squared	1.423380	Prob. Chi-Square(2)	0.4909

Source: computed by the researcher using E-views version 12 (2026).

Probability of the chi-square statistics result of the autocorrelation test has a value of 0.4909 (49.09%) which is greater than 5% level of significance, hence on this note, the null hypothesis of no autocorrelation is therefore accepted, hence the result of this analysis is reliable and free from a serial error correlation.

4.7 Heteroscedasticity Test (ARCH)

Table 4.7: Heteroscedasticity Test (ARCH)

F-statistic	3.648038	Prob. F(1,24)	0.0673
Obs*R-squared	3.430585	Prob. Chi-Square(1)	0.0631

Source: computed by the researcher using E-views version 12 (2026).

Probability of the chi-square statistics result of the heteroscedasticity test have a value of 0.0631 (6.40%) which is greater than 5% level of significance, hence on this note, the null hypothesis of homoscedasticity is accepted, therefore the result of this analysis is reliable and free non constant variance.

5.0 SUMMARY, CONCLUSION AND RECOMMENDATIONS

This study investigated the determinants of exchange rate dynamics in Nigeria using annual time-series data spanning from 1986 to 2024. The study was motivated by the persistent volatility and depreciation of the Nigerian Naira despite several exchange rate reforms and policy interventions. The research examined the influence of Gross Domestic Product (GDP), Degree of Openness (DO), Interest Rate (IT), and Inflation Rate (IN) on exchange rate behavior in Nigeria. Data for the study were sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin (2024), while the Autoregressive Distributed Lag (ARDL) approach was employed due to the mixed order of integration among the variables. The unit root results indicated that exchange rate, GDP, interest rate, and inflation were stationary at level, whereas degree of openness became stationary after first differencing. The ARDL Test revealed the existence of a long-run equilibrium relationship among the variables with an F-statistic of 6.312023, which exceeded the upper critical bounds. Long-run estimation results showed that GDP

and inflation exert positive and statistically significant effects on exchange rate, indicating that increases in these variables contribute to exchange rate depreciation. Degree of openness exhibited a significant negative effect, suggesting that increased trade openness promotes exchange rate stability and appreciation. Interest rate was found to have a positive but statistically insignificant effect in the long run. The Error Correction Model (ECM) coefficient of -0.472891 was statistically significant, indicating that approximately 47.29% of short-run disequilibrium is corrected annually. Diagnostic tests confirmed the absence of serial correlation and heteroscedasticity, thereby validating the robustness and reliability of the model.

The study concludes that exchange rate dynamics in Nigeria are largely driven by macroeconomic fundamentals, particularly gross domestic product, inflation rate, and degree of openness. The empirical evidence demonstrates that inflation and GDP growth significantly contribute to exchange rate depreciation, reflecting the import dependent structure of the Nigerian economy and persistent inflationary pressures. Conversely, increased trade openness contributes significantly to exchange rate appreciation and stability by enhancing export earnings and foreign exchange inflows. Although interest rate exhibited a positive relationship with exchange rate movements, its effect was not statistically significant in the long run, suggesting that monetary policy rate adjustments alone may not be sufficient to stabilize the foreign exchange market. The significant and negative error correction coefficient further confirms the existence of a stable long-run relationship among the variables and indicates that deviations from equilibrium are corrected at a moderate speed. The findings suggest that structural economic factors rather than purely monetary variables play a dominant role in shaping exchange rate behavior in Nigeria.

Based on the findings, the study recommends that the Federal Government of Nigeria should intensify efforts to expand domestic production capacity, particularly in export oriented sectors such as agriculture, manufacturing, and solid minerals, to increase foreign exchange earnings and reduce excessive

dependence on imports. The government and monetary authorities should implement effective inflation-control measures through prudent fiscal and monetary policies aimed at maintaining price stability and preserving the purchasing power of the Naira. Furthermore, policies that promote trade diversification and non oil exports should be strengthened to improve the degree of openness in a productive manner and enhance foreign exchange inflows. The Central Bank of Nigeria should complement interest rate policy with broader macroeconomic stabilization measures, including improved foreign exchange market management and investor confidence building initiatives. Finally, policymakers should pursue economic diversification strategies capable of reducing the economy's vulnerability to external shocks, particularly fluctuations in global oil prices, thereby ensuring sustainable exchange rate stability and long term economic growth.

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