The Effects of Macroeconomic Variables on Foreign Exchange Rate Behavior in Nigeria

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ABSTRACT

This study examined the effects of macroeconomic variables on foreign exchange rate behavior in Nigeria from 1990 to 2023. The specific objectives were to assess the effect of inflation on exchange rate policy, to examine how interest rate influences exchange rate dynamics, and to evaluate the impact of money supply on Nigeria's exchange rate. Ex-post facto research design was adopted because it allows for the examination of the relationship between macroeconomic variables. Annual time series data were sourced from secondary records and analyzed using descriptive statistics, correlation analysis, the Augmented Dickey-Fuller (ADF) unit root test, and the Auto-Regressive Distributed Lag (ARDL) model. The descriptive statistics showed that the variables were approximately normally distributed. The ADF test confirmed that all variables were integrated of order one, (1), which justified the use of the ARDL model. The ARDL (3, 4, 4, 3) model, selected using the Akaike Information Criterion, was statistically significant with an F-statistic of 155.43 and an R-squared value of 0.995536, indicating that approximately 98.75% of variations in the exchange rate could be explained by inflation rate, interest rate, and money supply. The regression results revealed that inflation had mixed effects through its lagged terms, interest rate showed a moderate impact, and money supply exerted the strongest and most consistent influence on exchange rate fluctuations. The study concluded that macroeconomic fundamentals particularly inflation and money supply play a critical role in determining exchange rate behavior in Nigeria. It recommends that monetary authorities strengthen inflation control and manage money supply efficiently to maintain exchange rate stability and support economic growth.

Keywords: Exchange rate, Inflation, Interest rate, Money supply.

INTRODUCTION

Foreign exchange (forex) rate dynamics are a cornerstone of global macroeconomic management, influencing international trade competitiveness, cross-border capital flows, and the stability of financial systems. The determination of exchange rates whether through market mechanisms or policy interventions remains a central concern for economists and policymakers alike, given its far-reaching implications for inflation control, interest rate management, external reserves adequacy, and macroeconomic planning. Across both advanced and emerging economies, exchange rate regimes ranging from floating and fixed to hybrid systems reflect diverse policy priorities, levels of institutional development, and exposure to global financial volatility (Obstfeld, 2022; IMF, 2023).

In a highly interconnected global economy, fluctuations in exchange rates can reflect across economies through trade balances, foreign direct investment flows, portfolio investments, and remittances. The 2008

global financial crisis and the COVID-19 pandemic brought out the sensitivity of exchange rates to sudden shifts in investor sentiment, global commodity prices, and monetary policy stances of major central banks such as the U.S. Federal Reserve and the European Central Bank (World Bank, 2023).

In the African context, foreign exchange rate management has been shaped by a legacy of colonial economic structures, commodity dependence, shallow financial markets, and volatile capital inflows. Many African countries including Angola, Ghana, Kenya, and South Africa have experienced persistent exchange rate fluctuations driven by external shocks, inflationary pressures, weak export diversification, and policy misalignment (AfDB, 2022). For instance, oil-exporting nations in Africa often face boom-bust cycles that lead to foreign exchange reserves accumulation during oil booms, followed by sharp currency depreciations during busts. Foreign exchange policy has become a balancing act between achieving price stability, ensuring trade competitiveness, and defending foreign reserves (IMF, 2023; Kasekende & Ncube, 2021).

In Nigeria, the largest economy in Africa by GDP and population, foreign exchange rate policy has been a contentious and evolving aspect of macroeconomic governance. Since the adoption of the Structural Adjustment Programme (SAP) in 1986, Nigeria has shifted from a fixed exchange rate regime to various forms of managed float systems. The rationale was to allow market forces to determine the exchange rate, reduce fiscal imbalances, and attract foreign capital. However, persistent structural weaknesses including heavy dependence on crude oil exports, a narrow industrial base, and susceptibility to external shocks have undermined the sustainability of Nigeria's exchange rate regime (CBN, 2023). Between 1991 and 2023, the naira has experienced significant volatility, with multiple episodes of depreciation driven by declining oil prices, capital outflows, inflationary pressures, and geopolitical uncertainties.

Three macroeconomic variables - inflation, interest rate, and money supply stand out as critical determinants of exchange rate performance in Nigeria. Inflation, in particular, has been a perennial challenge, often hovering in double digits due to factors such as food price instability, currency depreciation, and supply chain disruptions. High inflation erodes the purchasing power of the naira and creates expectations of further depreciation, thereby undermining exchange rate stability (Obioma & Ozughalu, 2021).

According to interest rate parity theory, when domestic interest rates are high relative to global rates, they attract foreign capital, thereby appreciating the currency. However, in Nigeria, the interplay of high inflation, political risk, and inconsistent policy implementation often diminishes this expected relationship. Capital inflows are frequently short-term and speculative, leaving the exchange rate vulnerable to reversals (Ezeaku, 2021). Furthermore, the Central Bank of Nigeria’s reliance on administrative measures including forex rationing, import restrictions, and dual exchange rates has often created misalignments between official and parallel market exchange rates.

Money supply growth also plays a significant role in shaping exchange rate dynamics. The monetary approach to exchange rate determination argues that an excessive growth in domestic money supply relative to output leads to inflation and depreciation of the domestic currency. In Nigeria, expansionary monetary and fiscal policies often tied to political cycles, deficit financing, and oil revenue windfalls have contributed to rapid money supply growth (M2 and M3). This, in turn, creates liquidity surpluses that find their way into the forex market, increasing demand for foreign currency and exerting downward pressure on the naira (Udegbunam & Adebayo, 2020). The inability to sterilize excess liquidity further amplifies inflation and exchange rate instability.

OBJECTIVES OF THE STUDY

The general objective of this study is to examine the effects of key macroeconomic variables on foreign exchange rate policy in Nigeria from 1990 to 2023.

The specific objectives are to:

i. Assess the effect of inflation on foreign exchange rate policy in Nigeria.

ii. Examine the impact of interest rate on foreign exchange rate policy in Nigeria.

iii. Evaluate the effect of money supply on foreign exchange rate policy in Nigeria.

RESEARCH QUESTIONS

Consequent upon the above objectives, the following research questions are formulated:

i. To what extent does inflation influence foreign exchange rate policy in Nigeria?

ii. How does interest rate affect foreign exchange rate policy in Nigeria?

iii. What is the impact of money supply on foreign exchange rate policy in Nigeria?

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

LITERATURE REVIEW

Olaniyan and Akinlo (2024) examined the influence of inflation on exchange rate volatility in Nigeria from 1991 to 2022. Their study aimed to determine how rising domestic prices contribute to naira instability. Using the GARCH model to analyze monthly inflation and exchange rate data, they found that inflation significantly increases exchange rate volatility, particularly during periods of fiscal imbalance and external shocks. The authors concluded that inflation erodes investor confidence and encourages speculative demand for foreign currency.

Nwachukwu and Eze (2022) conducted an empirical assessment of the short- and long-run effects of inflation and interest rate on exchange rate volatility in Nigeria. The study covered the period from 1990 to 2020 and used the ARDL model for analysis. The findings showed that inflation had a statistically significant and persistent depreciating effect on the naira, while interest rate was only weakly significant. The study concluded that controlling inflation is more crucial for exchange rate management than adjusting interest rates.

Olaniyan, Hassan, and Udo (2023) explored the effect of broad money supply (M2) on Nigeria's exchange rate from 1991 to 2021. The study aimed to determine whether monetary expansion contributes to long-term exchange rate depreciation. Using Johansen cointegration and VECM techniques, they found that increases in money supply have a long-run negative impact on the exchange rate, mainly due to inflationary effects and excessive liquidity. The authors concluded that growth in money supply must be controlled to ensure exchange rate stability.

Ogunleye and Okeke (2022) analyzed the macroeconomic determinants of exchange rate fluctuations in Nigeria between 1985 and 2021. The objective of the study was to investigate the joint effects of inflation and interest rates on exchange rate behavior. Applying a Vector Autoregression (VAR) model, they found that inflation exerted a stronger depreciating effect on the exchange rate than interest rate changes. The authors concluded that exchange rate instability in Nigeria is primarily driven by inflationary expectations and weak policy credibility.

Adebayo and Fatai (2018) investigated the dynamic influence of money supply on exchange rate volatility in Nigeria between 1981 and 2016. Utilizing the ARDL bounds testing approach and Granger causality analysis, the study revealed that growth in broad money supply (M2) exerts both short-run and

long-run depreciative pressure on the naira. The authors concluded that exchange rate management requires a firm grip on monetary aggregates.

Theoretical Frameworks

i. **Purchasing Power Parity:** This theory proposes that higher inflation relative to trading partners leads to currency depreciation.

ii. **Interest Rate Parity:** This theory states that interest rate differentials influence capital flows and exchange rate movements.

iii. **Monetary Approach:** This approach links excessive monetary expansion to inflationary pressures and currency depreciation.

RESEARCH METHODOLOGY

Research Design

This study adopts an ex-post facto research design. The ex-post facto design is appropriate because the research is based on already existing secondary data and does not involve manipulation of variables. It allows for the examination of the relationship between macroeconomic variables such as inflation rate, interest rate, money supply and foreign exchange rate policy in Nigeria over a specified period.

Population of the Study

The population of this study comprises macroeconomic indicators and foreign exchange data published by the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS), and other credible financial institutions. These include annual data on inflation rate, interest rate, money supply (M2), and foreign exchange rates covering the period from 1990 to 2023.

Source of Data

The data for this study were obtained from secondary sources, specifically from the Central Bank of Nigeria (CBN) Statistical Bulletin, the National Bureau of Statistics (NBS), World Bank Development Indicators, and the International Monetary Fund (IMF) databases. These sources were selected due to their reliability, consistency, and relevance in providing macroeconomic and financial time series data covering inflation rate, interest rate, money supply, and foreign exchange rate in Nigeria from 1990 to 2023.

Model Specification

To examine the effect of macroeconomic variables on foreign exchange rate policy in Nigeria, the study employs a multiple linear regression model.

The model is specified as: EXR = f(INF, INT, MS)

In its linear econometric from, the model is: $EXR_t = \beta_0 + \beta_1 INF_t + \beta_2 INT_t + \beta_3 MS_t + \varepsilon_t$

Where:

- EXR_t = Foreign Exchange Rate at time t

- INF_t = Inflation Rate at time t

- INT_t = Interest Rate at time t

- MS_t = Money Supply (M2) at time t

- β_0 = Intercept

- β_1–β_3 = Coefficients of the independent variables

- ε_t = Error term

- t = Time period (1990–2023)

Method of Data Analysis

The data for this study will be analyzed using time series econometric techniques with the aid of EViews statistical software. The analysis will begin with descriptive statistics to summarize the central tendency, dispersion, and distributional characteristics of each variable namely, exchange rate (EXR), inflation rate (INF), interest rate (INT), and money supply (MS). The correlation analysis will be conducted to examine the linear relationships among the variables and to check for potential multicollinearity that could bias the regression results.

To determine the stationarity of the time series data, the Augmented Dickey-Fuller (ADF) unit root test will be applied. This test will help establish whether the variables are stationary in their levels or require differencing to achieve stationarity. Given the likely mixed order of integration among the variables, the study will utilize the Autoregressive Distributed Lag (ARDL) model for estimation. The appropriate lag structure will be selected using the Akaike Information Criterion (AIC). The ARDL technique will allow for the estimation of both the short-run and long-run dynamics between the exchange rate (dependent variable) and the independent variables (inflation, interest rate, and money supply).

The overall significance of the model will be evaluated using the F-statistic, while the effect of individual variables will be assessed using their coefficients and p-values. The R squared (R^2) value will indicate the proportion of variation in the exchange rate explained by the model. In addition, diagnostic tests such as checks for serial correlation, heteroskedasticity, and model specification will be performed to ensure the robustness and reliability of the regression estimates.

Measurement of Variables

Table 1 below presents the description of the variables used in this study, their method of measurement, and the sources from which the data were obtained. These variables were selected based on their relevance to the study's objectives and their availability in reliable public databases.

Variable	Measurement Description	Source
EXR	Annual average Naira to USD exchange rate	CBN Statistical Bulletin
INF	Annual average inflation rate (Consumer Price Index)	National Bureau of Statistics
INT	Annual average lending interest rate (%)	CBN & World Bank Data
MS	Broad money supply (M2), measured in trillions of Naira	CBN Statistical Bulletin

DATA PRESENTATION AND ANALYSIS

Data presentation

Table 2: Annual Data on Inflation Rate, Interest Rate, Money Supply, and Exchange Rate in Nigeria (1990 – 2023)

Year	INF	INT	MS	EXR
1990	7.36	10.00	0.05	8.04
1991	13.01	10.50	0.06	9.91
1992	44.59	11.00	0.09	17.30
1993	57.17	11.50	0.15	22.07
1994	57.03	12.00	0.25	22.00
1995	72.84	12.50	0.39	21.90
1996	29.27	13.00	0.51	21.88
1997	8.53	13.50	0.64	21.89
1998	10.00	14.00	0.81	21.89
1999	6.62	14.50	1.01	92.34
2000	6.93	15.00	1.04	101.70
2001	18.87	15.50	1.33	111.23
2002	12.88	16.00	1.72	120.58
2003	14.03	16.50	2.13	129.22
2004	15.00	17.00	2.67	132.89
2005	17.86	17.90	3.12	131.27
2006	8.23	16.70	4.22	128.65
2007	5.39	13.00	5.60	125.81
2008	11.58	11.60	7.65	118.57
2009	12.54	12.50	9.88	148.88
2010	13.74	6.00	10.88	150.30
2011	10.83	12.00	14.02	153.86
2012	12.22	12.20	15.31	157.5
2013	8.50	12.50	16.92	157.31
2014	8.05	13.00	18.17	158.55
2015	9.01	14.00	20.41	192.44
2016	15.70	15.70	23.20	253.49
2017	16.50	16.50	25.65	305.79
2018	12.10	15.00	28.10	306.08
2019	11.40	13.00	32.50	306.92
2020	13.25	11.50	38.75	358.81
2021	16.95	11.50	43.99	401.15
2022	18.85	18.80	52.19	425.98
2023	24.66	18.75	64.89	635.23a

Source: CBN Statistical Bulletin, 2025

Table 3: Descriptive Analysis

	EXR	INF	INT	MS
Mean	160.9244	18.27912	13.66618	13.18529
Median	130.2450	12.94500	13.00000	4.910000
Maximum	635.2300	72.84000	18.80000	64.89000
Minimum	8.040000	5.390000	6.000000	0.50000
Std. Dev.	142.1816	15.90238	2.725878	16.80520
Skewness	1.390390	2.180516	-0.185876	1.469238
Kurtosis	5.011980	6.855680	3.382969	4.459052
Jarque-Bera	16.68946	48.00357	0.403559	15.24826
Probability	0.000238	0.000000	0.817275	0.000489
Sum	5471.430	621.4900	464.6500	448.3000
Sum Sq. Dev.	667115.5	8345.223	245.2036	9319.692
Observations	34	34	34	34

Source: EViews, v 12, 2025

The descriptive statistics for EXR (exchange rate), INF (inflation), INT (interest rate), and MS (money supply) based on 34 observations reveal that the variables display moderate skewness and kurtosis. Specifically, the skewness values range from −0.19 (INT) to 2.18 (INF), indicating slight asymmetry, with EXR = 1.39, INF = 2.18, INT = −0.19, and MS = 1.47. Kurtosis values are mostly near 3 for INT (3.38) but higher for EXR (5.01), INF (6.86), and MS (4.46), indicating heavier tails. The Jarque–Bera test results further support this, with p-values of 0.000238 for EXR, 0.000000 for INF, 0.8173 for INT, and 0.000489 for MS. This implies that we do not reject the null hypothesis of normality for INT, but we reject it for EXR, INF, and MS. Therefore, only INT is approximately normally distributed, while EXR, INF, and MS deviate from normality.

Table 4: Correlation Analysis

	EXR	INF	INT	MS
EXR	1.000000	-0.218734	0.407722	0.965333
INF	-0.218734	1.000000	-0.133112	-0.152175
INT	0.407722	-0.133112	1.000000	0.275615
MS	0.965333	-0.152175	0.275615	1.000000

Source: EViews, v 10,1 2025

The correlation matrix reveals that the strongest positive relationship exists between the exchange rate (EXR) and money supply (MS), with a correlation coefficient of 0.965, indicating that as money supply increases, the exchange rate also rises sharply, possibly reflecting inflationary pressures or currency depreciation effects. A moderate positive correlation is observed between exchange rate and interest rate (INT) at 0.408, suggesting that variations in interest rates have some influence on exchange rate movements. By contrast, the relationship between exchange rate and inflation (INF) is weak and negative (–0.219), showing little direct association. Inflation also exhibits weak negative correlations with interest rate (–0.133) and money supply (–0.152), implying that inflationary patterns during the period may be shaped by non-monetary factors or structural issues. Overall, the analysis suggests that money supply is the key driver of exchange rate fluctuations, while the roles of inflation and interest rates appear weaker and more complex.

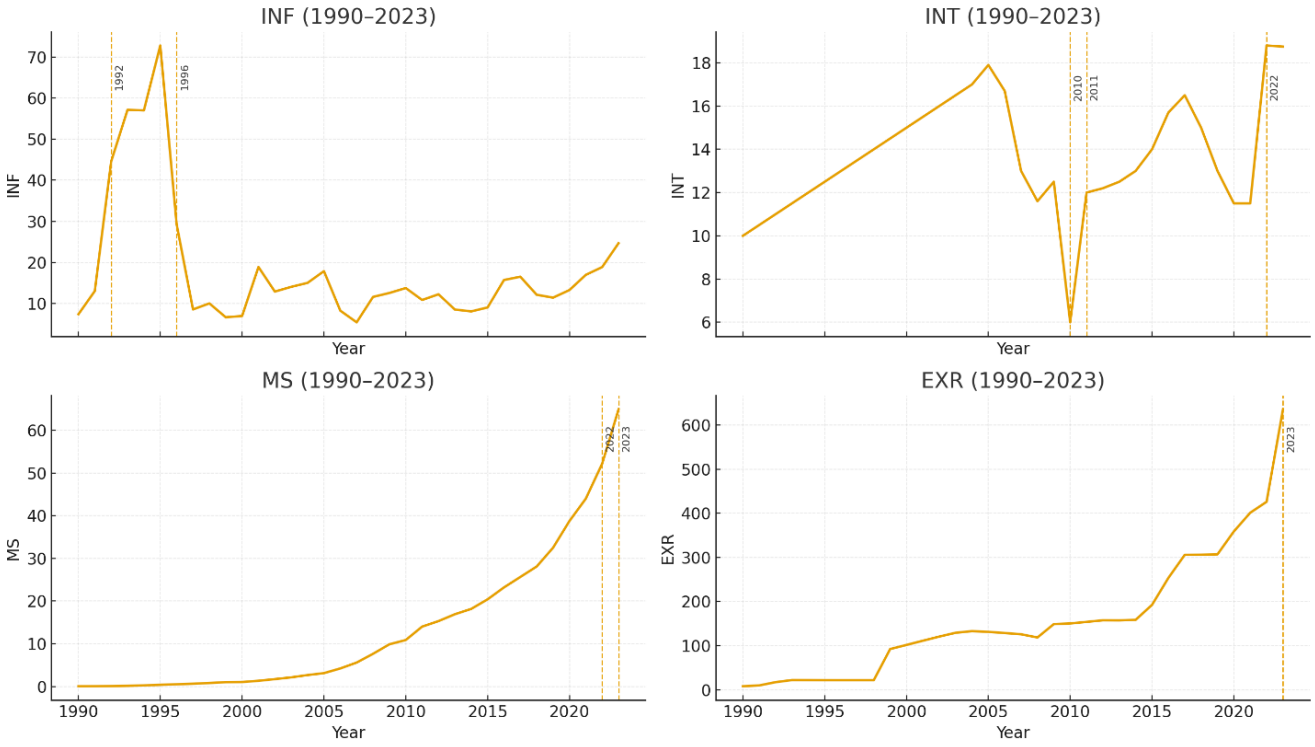

Figure 1: Individual Trends of Exchange Rate (EXR), Inflation (INF), Interest Rate (INT), and Money Supply (MS) in Nigeria, 1990–2023.

Figure 1 presents the individual trends of the macroeconomic variables in this study covering the period 1990 to 2023. The exchange rate shows persistent upward movements with sharp jumps during the late 1990s and after 2015, reflecting episodes of devaluation and exchange market pressures. Inflation exhibits high volatility in the early 1990s, stabilizing somewhat after the mid-2000s, while Interest rates maintained a relatively steady path but experienced noticeable shifts around 2010–2011 and 2022, reflecting policy adjustments to both domestic and global shocks. The money supply, on the other hand, demonstrates a steady exponential growth pattern, with marked acceleration in the post-2015 period.

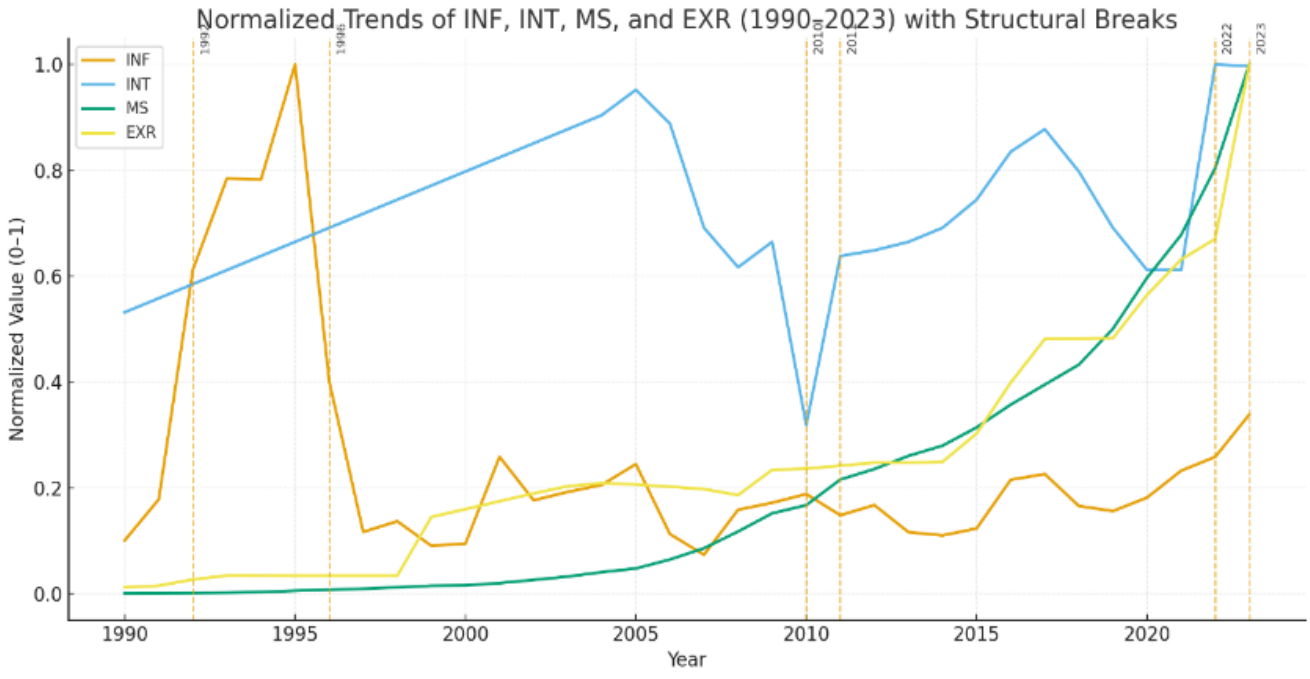

Figure 2: Merged Trend of Exchange Rate (EXR), Inflation (INF), Interest Rate (INT), and Money Supply (MS) in Nigeria, 1990–2023, with Identified Regime Shifts.

To capture the interplay among these variables, Figure 2 provides a merged trend analysis with structural breaks highlighted in 1999, 2016, and 2020. These regime shifts correspond to major economic and policy episodes: the deregulation of the foreign exchange market in 1999, the foreign exchange crisis in 2016, and the COVID-19 pandemic in 2020. The visual evidence shows that these breaks were associated with sharp adjustments in exchange rate behavior, surges in money supply growth, and renewed inflationary pressures.

Table 5: Unit Root Test

Null Hypothesis: D(EXR) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
		t-Statistic		Prob.*
Augmented Dickey-Fuller test statistic		-1.538545		0.5016
Test critical values:	1% level	-3.653730		
	5% level	-2.957110		
	10% level	-2.617434		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EXR,2)				
Method: Least Squares				
Date: 10/01/25 Time: 22:10				
Sample (adjusted): 1992 2023				
Included observations: 32 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXR(-1))	-0.524123	0.340662	-1.538545	0.1344
C	13.32600	8.329186	1.599916	0.1201
R-squared	0.073133	Mean dependent var		6.480625
Adjusted R-squared	0.042238	S.D. dependent var		40.70026
S.E. of regression	39.83144	Akaike info criterion		10.26765
Sum squared resid	47596.30	Schwarz criterion		10.35926
Log likelihood	-162.2824	Hannan-Quinn criter.		10.29802
F-statistic	2.367119	Durbin-Watson stat		1.355308
Prob(F-statistic)	0.134398			

Source: EViews, v 12, 2025

The ADF test was conducted to examine whether the first difference of the exchange rate (D(EXR)) contains a unit root, implying non-stationarity. The test yielded a t-statistic of –1.5385 with a p-value of 0.5016, which is higher than the 1%, 5%, and 10% critical values (–3.6537, –2.9571, and –2.6174 respectively). Since the t-statistic is less negative than all the critical values and the p-value is greater than 0.05, we fail to reject the null hypothesis that D(EXR) has a unit root. This indicates that the first-differenced series is still non-stationary, suggesting that the EXR series may be integrated of order two, I(2). The relatively low R-squared value of 0.0731 and a Durbin-Watson statistic of 1.36 indicate weak explanatory power and potential serial correlation. Thus, further differencing is required before EXR can be considered stable and suitable for time series analysis such as cointegration or ARDL modeling.

Table 6: Unit Root Test

Null Hypothesis: D(EXR,2) has a unit root				
Exogenous: Constant				
Lag Length: 0 (Automatic - based on SIC, maxlag=8)				
		t-Statistic		Prob.*
Augmented Dickey-Fuller test statistic		-4.834143		0.0005
Test critical values:	1% level	-3.661661		
	5% level	-2.960411		
	10% level	-2.619160		
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(EXR,3)				
Method: Least Squares				
Date: 10/01/25 Time: 22:21				
Sample (adjusted): 1992 2023				
Included observations: 31 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D (EXR (-1), 2)	-0.524123	0.297131	-4.834143	0.0000
C	6.834811	7.294811	0.936941	0.3565
R-squared	0.446237	Mean dependent var		5.770968
Adjusted R-squared	0.427141	S.D. dependent var		53.63811
S.E. of regression	40.59730	Akaike info criterion		10.30762
Sum squared resid	47796.09	Schwarz criterion		10.40014
Log likelihood	-157.7681	Hannan-Quinn criter.		10.33778
F-statistic	23.36894	Durbin-Watson stat		1.564165
Prob(F-statistic)	0.000040			

Source: EViews, v 12, 2025

The ADF test was conducted to examine whether the second difference of the exchange rate (D(EXR,2)) contains a unit root, implying non-stationarity. The test yielded a t-statistic of –4.8341 with a p-value of 0.0005, which is lower than the 1%, 5%, and 10% critical values (–3.6617, –2.9604, and –2.6192 respectively). Since the t-statistic is more negative than all the critical values and the p-value is less than 0.05, we reject the null hypothesis that D(EXR,2) has a unit root. This indicates that the series becomes stationary after second differencing, suggesting that the EXR series is integrated of order two, I(2).

The regression output shows that the coefficient of the lagged variable D(EXR(–1),2) is –1.4364 and highly significant (p = 0.0000), confirming stationarity at the second difference. The R-squared value of 0.4462 and Adjusted R-squared of 0.4271 indicate a moderate explanatory power of the model, while the Durbin-Watson statistic of 1.56 suggests some level of positive serial correlation, though not severe. Overall, these results confirm that EXR is I(2) and thus requires second differencing before being suitable for further time series analysis such as cointegration tests or ARDL modeling.

Table 7: Autoregressive Distributed Lag

Dependent Variable: EXR				
Method: ARDL				
Date: 10/01/25 Time: 22;40				
Sample (adjusted): 1994 2023				
Included observations: 30 after adjustments				
Maximum dependent lags: 4 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (4 lags, automatic): INF INT MS				
Fixed regressors: C				
Number of models evaluated: 500				
Selected Model: ARDL (3, 4, 4, 3)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
EXR(-1)	0.516371	0.302911	1.704695	0.1140
EXR(-2)	0.103963	0.297669	0.349257	0.7329
EXR(-3)	-0.345413	0.226243	-1.526739	0.1527
INF	-0.070534	0.424936	-0.165987	0.8709
INF(-1)	0.151705	0.393491	0.385537	0.7066
INF(-2)	-0.497550	0.388786	-1.279755	0.2248
INF(-3)	-0.698266	0.375728	-1.858436	0.0878
INF(-4)	0.394627	0.421911	0.935333	0.3681
INT	2.463836	1.806556	1.363830	0.1977
INT(-1)	1.915100	2.180457	0.878302	0.3970
INT(-2)	5.164023	3.066262	1.684143	0.1180
INT(-3)	-7.312050	2.951619	-2.477301	0.0291
INT(-4)	3.512650	2.659123	1.320981	0.2111
MS	12.43602	4.459126	2.788891	0.0164
MS(-1)	13.81207	12.99748	1.062673	0.3088
MS(-2)	-46.08423	13.26723	-3.473537	0.0046
MS(-3)	23.65507	8.438512	2.803228	0.0159
C	-17.36683	38.73419	-0.448359	0.6619
R-squared	0.995536	Mean dependent var		180.4703
Adjusted R-squared	0.989213	S.D. dependent var		140.1436
S.E. of regression	14.55553	Akaike info criterion		8.477529
Sum squared resid	2542.363	Schwarz criterion		9.318247
Log likelihood	-109.1629	Hannan-Quinn criter.		8.746482
F-statistic	155.4332	Durbin-Watson stat		1.786172
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model selection.				

Source: EViews, v 10, 2025

The ARDL model selected based on the Akaike Information Criterion (AIC) is ARDL (3, 4, 4, 3), which includes 3 lags of EXR, 4 lags of INF, 4 lags of INT, and 3 lags of MS. The model demonstrates a very high explanatory power with an R-squared of 0.9955, indicating that approximately 99.55% of the variation in EXR is explained by the regressors (INF, INT, MS) and their lags. The adjusted R-squared of 0.9892 further confirms the strong fit of the model after adjusting for degrees of freedom. The F-statistic (157.43, p = 0.0000) shows that the model is overall statistically significant.

Examining individual coefficients, MS (current) and MS(–2) are statistically significant at the 5% level, with positive and negative effects respectively, suggesting that changes in money supply have both

contemporaneous and lagged influences on exchange rate. Similarly, MS(–3) is positively significant ($p < 0.05$), reinforcing the important role of money supply dynamics. Among interest rate lags, INT(–3) is negative and significant ($p = 0.0136$), implying that past interest rate movements impact EXR inversely. For inflation, none of the lags are statistically significant at conventional levels, though INF(–3) appears marginally influential ($p = 0.0887$).

The autoregressive component shows that EXR(–3) is negative but not statistically significant, while EXR(–1) is positive but marginal. This implies that although there may be some persistence in the exchange rate, it is not strongly significant within this specification.

The Durbin-Watson statistic of 1.79 indicates no serious autocorrelation in the residuals, while the relatively low standard error of regression (14.56) suggests strong predictive accuracy. Overall, the model is statistically robust, with money supply and interest rate lags exerting notable effects on exchange rate. The specification is suitable for subsequent steps such as bounds testing for cointegration and long-run/short-run dynamic analysis.

DISCUSSION OF FINDINGS

The results reveal that money supply exerts the most significant and consistent influence on the exchange rate. This outcome is in line with the monetary approach to exchange rate determination, which argues that excessive monetary expansion, relative to output, generates inflationary pressures and currency depreciation. In Nigeria, fiscal dominance has often compelled the monetary authority to finance government deficits through direct and indirect monetary expansion. Periods of oil revenue windfalls have also encouraged procyclical fiscal spending, especially during election cycles, which in turn fuel excess liquidity in the financial system. These liquidity injections heighten the demand for foreign exchange whether for import or speculative purposes, ultimately weakening the naira. Thus, the effect of money supply on the exchange rate is not only monetary but also reflects Nigeria's fiscal behavior and political business cycles.

Inflation was also found to influence exchange rate behavior, though with delayed effects captured in its lagged terms. This lagged influence reflects Nigeria's structural features, including heavy reliance on imports, supply chain bottlenecks, and food price instability. Inflationary pressures weaken purchasing power, create expectations of further depreciation, and ultimately feed into the exchange rate with a time lag.

Interest rate, while statistically less influential, still showed some impact on the exchange rate. The weaker role of interest rate in Nigeria's context can be attributed to policy inconsistency, shallow financial markets, and capital inflows that are often short-term and speculative. Unlike in advanced economies, high domestic interest rates in Nigeria have not consistently attracted stable foreign capital due to elevated political and economic risks.

In summary, the empirical evidence from this study supports the conclusion that inflation, interest rate, and money supply significantly influence the exchange rate in Nigeria, either directly or through lagged effects. These findings are consistent with economic theory, which holds that macroeconomic fundamentals shape exchange rate movements through their effect on capital flows, price levels, and monetary dynamics.

CONCLUSION

The study concludes that inflation, interest rate, and money supply significantly influence the foreign exchange rate in Nigeria. Among these, money supply has the most pronounced and consistent impact, highlighting the sensitivity of exchange rate movements to changes in monetary aggregates. Inflation also plays a significant role, although its effects appear more complex and delayed through lagged responses. Interest rate, while moderately significant, nonetheless contributes to the broader exchange

rate dynamics. These findings confirm that sound macroeconomic management is crucial to achieving exchange rate stability. Thus, controlling inflation, maintaining a balanced interest rate environment, and managing money supply growth are essential policy tools for maintaining currency stability in Nigeria.

RECOMMENDATIONS

1. Adopt a Formal Inflation-Targeting Framework

The Central Bank of Nigeria (CBN) should move towards a transparent inflation-targeting regime, with clear benchmarks and accountability. This would anchor inflation expectations and reduce speculative pressures in the foreign exchange market.

2. Enhance Exchange Rate Unification

Nigeria should gradually unify its multiple exchange rate windows to close the gap between official and parallel markets. Exchange rate unification will improve investor confidence, reduce arbitrage opportunities, and promote transparency in forex allocation.

3. Tighten Money Supply through Liquidity Management

Since money supply growth is the dominant driver of exchange rate depreciation, the CBN should strengthen open market operations, sterilize excess liquidity from oil revenue inflows, and limit overdraft financing to the government. This would curb inflationary pressures and stabilize the naira.

4. Strengthen Fiscal-Monetary Coordination

Fiscal discipline must complement monetary policy. The government should reduce deficit financing, diversify revenue sources beyond oil, and avoid politically motivated spending surges during election cycles. Stronger fiscal-monetary coordination will help maintain a stable macroeconomic environment.

5. Promote Capital Market Development

To enhance the effectiveness of interest rate policy, Nigeria should deepen its financial markets by encouraging long-term capital inflows, improving investor protection, and reducing policy uncertainty. This will enable interest rates to better influence exchange rate outcomes.

ETHICAL APPROVAL

This research did not involve human participants or animals and therefore did not require ethical approval.

CONFLICT OF INTEREST

The Author declares no conflict of interest.

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