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MONETARY POLICY AND EXCHANGE RATE DYNAMICS IN NIGERIA

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Abstract
Exchange rate stability remains a central concern for Nigeria's economic performance, given its implications for growth, investment, and external competitiveness. Persistent exchange rate volatility has raised questions about the effectiveness of monetary policy in managing macroeconomic stability. This study investigates the impact of monetary policy on exchange rate dynamics in Nigeria using annual time series data from 1986 to 2023. The analysis applied the Autoregressive Distributed Lag (ARDL) framework, and the results showed that money supply exerted a positive but insignificant impact on the real exchange rate, while interest rate has positive and significant impact. On the other hand, real gross domestic product and credit to private sector have negative but significant impact on exchange rate behaviour. Similarly, inflation rate negatively impacted exchange rate dynamics but the impact was not significant. These findings highlight the crucial role of monetary policy in exchange rate management. The study therefore recommends that government authorities should adopt sound monetary policies to promote exchange rate stability, while the Central Bank of Nigeria should implement a single-digit interest rate regime to lower the cost of capital, encourage private sector investment, and improve the ease of doing business.
Keywords: Real exchange rate, monetary policy, ARDL, Nigeria.

JEL Codes: C18, C24, C20, G12

1. Introduction

Exchange rate fluctuation causes an unstable environment that leads to a decline in economic performance of a country. Exchange rate can be defined as the amount of domestic currency that is required to purchase one unit of foreign currency (Oladipo, 2016; Kayode et al., 2025). Volatility in exchange rate occurs when there is unsteadiness in the value of one country's currency in relation to others. According to Chowdhury (2004), exchange rate has been found to play a valuable role in predicting currency crises, which affects the emerging market economies. This currency crisis increases or declines the real gross domestic product. The exchange rate of a country plays an important role as it affects all the macroeconomic variables which state the reason why the monetary authorities and private sectors aim to stabilize these variables. Aliyu (2011) maintained that exchange rate

appreciation will result in increased imports and declined export while depreciation would expand export and discourage import.

Monetary policy refers to the actions of the Central Bank of Nigeria to regulate the money supply which could be through discretionary monetary policy instruments such as the open market operation (OMO), discount rate, reserve requirement, direct control of bank credit, and direct regulation of interest rate (Iyoha, 2002; Effiong et al., 2022). Nnanna (2001) defined monetary policy as the effort of government to regulate money supply and availability of credit for the stabilization of the economy. According to Uchendu (2009), he stated that monetary policy is the use of monetary policy instruments to control the availability of money with the purpose of achieving price stability. The primary goal of monetary policy in Nigeria is the maintenance of price and exchange rate stability. Macroeconomic aggregates are being influenced by monetary policy through the interest rate and exchange rate channels.

Exchange rate fluctuations in Nigeria have led to an unstable environment which can be attributed to the reason why the country finds it difficult to boost its economic performance. As such, despite the vast opportunities in agriculture, oil and gas, Nigeria has achieved a very minimal growth as a result of depreciating exchange rate which affects the standard of living of its citizens. The government, through its monetary authority, has adopted a viable strategy and policy to solve the problem of weak exchange rate while boosting its economic growth. This policy is the Nigerian Autonomous Foreign Exchange Rate Fixing Methodology (NAFEX) adopted in 2007 in response to the currency crisis in 2007. However, despite these macroeconomic policy measures, the performance of the Nigerian exchange rate has been dismal. The decreasing foreign reserves, feeble non-oil export earnings, deviations in oil earnings, and expansionary economic policies, with so many other factors, have been attributed to the depreciation in the value of Naira. The major questions here are, regardless of government's effort to stabilize the exchange rate, why are there still fluctuations in the rate and to what extent has monetary policy been effective in ensuring stable and favourable exchange rate for the naira?

Notwithstanding the significance of monetary and exchange rate policies in economic development, a few studies have been done in Nigeria to examine the nexus between exchange rate and monetary policy. A lot of opinion exists on exchange rate dynamic and monetary policy in Nigeria. The opinions of Micheal (2010), Ndubuisi, Kalu and Obidike (2017) which argue that monetary policy has a positive impact in stabilizing exchange rate dynamic in Nigeria and the view of Umar (2013) which states that monetary policy has a

negative impact and does not help in achieving favourable exchange rate in Nigeria. The friction between exchange rate dynamic and monetary policy is of interest to researchers and policy analyst. This inspired this study to investigate the variations in the exchange rate and how monetary policy helps to stabilize the exchange rate dynamic. Therefore, following this background, the study aims to examine the impact of monetary policy on exchange rate dynamics in Nigeria. The findings of this study would be of practical relevance to government and policy makers in Nigeria in determining how best to channel exchange rate to boast economic performance in Nigeria. The rest of the paper is structured as follows: Section Two is cantered on the literature review; Section Three concentrates on the methodology; Section Four presents the results and Section Five is the conclusion.

2. Literature Review

2.1. Theoretical Literature

This section examines theories that deal with exchange rate.

The Purchasing Power Parity

The purchasing power parity (PPP) theory is credited to Gustav Cassel, a Swedish economist, who developed and popularized its empirical version in the 1920s. The nominal exchange rate considers the buying power of one currency relative to another and that an exchange of purchasing power occurs between any two countries which are measured by the equivalent of one country's price level against another (Cassel, 1916). The terms of free trade are that the nominal exchange rate between two countries should be equal to the ratio of the price levels in the two countries (Taylor, 1988). This approach assumes that real equilibrium exchange rates remain constant over time and therefore, the nominal exchange rate movement tends to offset relative price movements. The purchasing power parity defines two equilibrium rate systems. The first is the short run equilibrium exchange rate which is defined as the rate that would exist under a purely floating exchange rate balance. Second is the long-run equilibrium that would yield balance of payment equilibrium over a time period in cooperative and cyclical swings in the balance of payments (including those of prevailing exchange rate by the relative purchasing power in a currency are generally attributed to the problem of arbitrage and expectations in the commodity market. The Purchasing Power Parity has been criticized by some economists as defective for the following reasons: Defects of index numbers, the PPP theory presumes a direct linkage between the price level of two legal tender and the exchange rate. However, there are many other factors such as tariff speculation, capital flows which can influence the exchange rate. Based on this theory, the exchange rate should reflect the prices of all

goods and services in an economy. However, only some goods and services enter international trade. Goods traded internally have no influence on the exchange rate, the PPP theory assumes that a change in price level results in a change in the exchange rate. But empirical evidence has shown that exchange rate governs prices and not vice versa.

2.2 Empirical Literature

A few researches have been carried out on the impact of monetary policy on exchange rate dynamics in Nigeria. A good number of empirical studies show that monetary policy has a significant impact on real exchange rate fluctuation. Some other scholars are of the view that no significant relationship exist between monetary policy and exchange rate. For instance, Kayode et al. (2025) examined the effect of monetary policy on the exchange rate in Nigeria from 1960 to 2023 using a Time-Varying Parameter Vector Autoregression (TVP-VAR) model. The study found that monetary policy effects varied across regimes. It was weak during 1960–1970, strong and significant in 1971–1985, volatile in 1986–1992, moderate in 1993–1999, and mixed from 2000–2023, concluding that institutional and structural constraints limit monetary policy's effectiveness on exchange rate dynamics in Nigeria. The influence of monetary and fiscal policies on exchange rate movements was examined by Effiong et al. (2022). The study covered the period of 1985 to 2020 and employed the ordinary least squares method (OLS), threshold regression, impulse response function, and the variance decomposition. It was however revealed that broad money supply, debt and expenditure exerted positive and significant impact while revenue showed negative impact. *Aderemi et al. (2019) applied ARDL to investigate the impact of monetary policy on exchange rate in Nigeria between 1990 and 2016. The result found that monetary policy rate and broad money supply had positive relationship while credit reserve requirement and Treasury bill rate had negative impact.*

Adenigbagbe et al. (2024) studied the impact of monetary policy on exchange rate between 1980 to 2023 using multiple regression and analysis of variance (ANOVA). The study revealed that money supply, interest rates, and central bank reserves all have positive and significant effects on changes in exchange rates. Ndubuisi et al. (2017) looked at monetary policy and exchange rate stability in Nigeria using time series data from 1981 to 2014. They employed multiple regression analysis and found that a long run relationship existed between monetary policy and exchange rate in Nigeria.

Zafar and Sabo (2013) examined the effects of monetary policy variables on exchange rate using multiple regression analysis and time series data over the period 1980-2010, the result showed that money supply, Treasury bill

rate and cash reserve ratio negatively and significantly impacted on exchange rate. Empirical results also suggested that monetary policy rate was negatively related to exchange rate suggesting that timely and effective implementation of monetary policy decisions is the best alternative to exchange rate stability. Umar (2013) investigated the impact of monetary policy on exchange rate in Nigeria using time series data for the period 1980-2011. The study adopted the Granger causality test and error correction mechanism (ECM), the results revealed that money supply had positive and significant effect on exchange rate while monetary policy rate and liquidity ratio impacted negatively on exchange rate. The study concluded that for exchange rate stability to be achieved in Nigeria, suitable monetary policy should be formulated and implemented.

Michael (2010) examined the impact of monetary policy rate on exchange rate fluctuation in Nigeria economy using a time series data from 1986-2005. It observed that changes in monetary policy rate played a significant role in determining the direction of exchange rate movement. Ahmed and Rafar (2009) examined the determinants of exchange stability in Nigeria using annual time series data from 1990-2007. The OLS technique was used to examine the degree of influence of broad money, cash reserve ratio, exports and real GDP on exchange rate. The money supply and cash reserve ratio were statistically significant. They recommended that Nigeria needs to diversify her export to increase the supply side of foreign exchange and to reduce the pressure on naira due to increase in demand for foreign exchange.

Zulu and Paul (2008) investigated the impact of monetary policy on exchange rate in Zambia from 1992 to 2006. The study used multiple regression technique in the analysis and discovered that money supply and liquidity ratio had positive impact on exchange rate while monetary policy rate revealed negative and significant impact on exchange rate. They recommended that there is need to introduce more depth in monetary policy and effectual utilization of foreign direct investment to make monetary policy more driven.

Empirical research has been carried out on the impact of monetary policy on exchange rate dynamics in Nigeria. But most of these studies like Ahmed and Rafar (2009), and Ndubuisi et al. (2017) made use of OLS estimation technique which is not adequate in generating consistent and robust coefficient estimates about the study variables, thereby providing a gap in the methodology used. This study adopted the more advanced ARDL method, which allows for a more robust co-integration that play well with small sample sizes. Through this method, it becomes methodologically possible to deal with model selection, estimation, inference and to determine the long

run and short run impact of monetary policy on exchange rate dynamic in Nigeria.

3. Research Methods and Procedure

This study employed annual time series data between 1985 and 2020. The data were collected from Central Bank of Nigeria (CBN) and Nigeria Bureau of Statistics (NBS) statistical database.

3.1 Model Specification

The main focus of this study is to examine the impact of monetary policy on exchange rate dynamics in Nigeria. From our analytical framework and literature review, the model is hereby specified following the work of Ndubuisi et al. (2017) with some modifications in a functional form as follows:

$$REXR = f(MS, RGDP, INTR, INFR, CRPS) \quad (3.1)$$

Where: REXR - Real exchange rate; MS - Money supply; RGDP - Real gross domestic product; INTR - Interest rate; INFR = inflation rate; CRPS = credit to private sector.

The econometric form of this model is therefore specified thus;

$$REXR_t = \beta_o + \beta_1 MS_t + \beta_2 RGDP_t + \beta_3 INTR_t + \beta_4 INFR_t + \beta_5 CRPS_t + U_t \quad (3.2)$$

Where: u_t is the error term that is assumed to be normally distributed with the mean of zero and constant variance; β_0 = Constant term/intercept; β_1; β_2; β_3; β_4; β_5 = Slope coefficients.

3.2 Estimation Technique

The study employed the Autoregressive Distributed Lag (ARDL) methods to examine the relationship between monetary policy and exchange rate dynamics in Nigeria. Autoregressive Distributed Lag (ARDL) is a long-established method of estimating co-integrating relationships among the variables by computing the Bounds F-statistic (bounds test for cointegration). Also, estimates provided by ARDL method avoid problems such as autocorrelation and endogeneity, they are unbiased and efficient and can accommodate greater number of variables in comparison to vector autoregressive (VAR) models and more flexible with respect to lag structure since it can accommodate different optimal lag structure for different variables in the model, which is not applicable in the other cointegration methods (Rahman & Islam, 2020).

$$\begin{aligned} REXR_t = {} & \beta_0 + \beta_1 \mathrm{REXR}_{t-1} + \beta_2 \mathrm{MS}_{t-1} + \beta_3 \mathrm{RGDP}_{t-1} + \beta_4 \mathrm{INTR}_{t-1} + \beta_5 INFR_{t-1} \\ & + \beta_6 CRPS_{t-1} + \sum_{i=1}^{p} \beta_1 \Delta \mathrm{REXR}_{t-1} + \sum_{i=1}^{p} \beta_2 \Delta \mathrm{MS}_{t-1} \\ & + \sum_{i=1}^{p} \beta_3 \Delta \mathrm{RGDP}_{t-1} + \sum_{i=1}^{p} \beta_4 \Delta \mathrm{INTR}_{t-1} + \sum_{i=1}^{p} \beta_5 \Delta \mathrm{INFR}_{t-1} \\ & + \sum_{i=1}^{p} \beta_6 \Delta \mathrm{CRPS}_{t-1} - \emptyset \mathrm{ECM}_{t-1} + £_t \end{aligned} \quad 3.3$$

Where, ln is the natural logarithm, Δ is first difference operator.

4. Presentation and Interpretation of Results

4.1 Test for Stationarity

Table 4.1: Summary of ADF and Phillips-Perron Unit Root Tests

Variable	ADF t-statistic	PP t-statistic	5% Critical Value	p-value (ADF)	p-value (PP)	Order of Integration
D(REXR)	-6.300480	-6.316704	-2.945842	0.0000	0.0000	**I(1)**
MS	-2.961805	-4.093869	-2.943427	0.0480	0.0030	**I(0)**
D(MS)	-4.066806	-4.093869	-2.945842	0.0003	0.0030	**I(1)**
D(RGDP)	-3.887954	-3.771678	-2.945842	0.0051	0.0069	**I(1)**
INTR	-3.606069	-3.703914	-2.943427	0.0104	0.0081	**I(0)**
INFR	-3.868118	-3.412601	-2.945842	0.0054	0.0168	**I(0)**
D(CRPS)	**-3.876209**	**-3.812038**	**-2.945842**	**0.0053**	**0.0062**	**I(1)**

Source: Authors' computation using Eviews 13

The results from the ADF and PP tests indicate that most of the variables are stationary after first differencing, while a few are stationary at level. Specifically, real exchange rate (D(REXR)), real GDP (D(RGDP)), and credit to private sector (D(CRPS)) became stationary only after first differencing, showing they were integrated of order one, I(1). On the other hand, money supply (MS), interest rate (INTR), and inflation rate (INFR) were already stationary at their levels, meaning they were integrated of order zero, I(0). In order to test for cointegration among the variables, bound test was carried out through autoregressive distributed lag model as proposed by Pesaran et al (2001).

4.2 Lag Selection Criteria

Table 4.2: VAR Lag Selection Criteria

VAR Lag Order Selection Criteria						
Endogenous variables: REXR MS RGDP INTR INFR CRPS						
Exogenous variables: C						
Sample: 1986 2023						
Included observations: 37						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	135.0641	NA	3.76e-11	-6.976438	-6.715208	-6.884342

1	342.0092	335.5866*	3.75e-15*	-16.21671*	-14.38810*	-15.57204*
*** indicates lag order selected by the criterion**						

Source: Authors' computation using Eviews 13

The VAR lag order selection results indicated that lag 1 was optimal according to all the criteria (Likelihood Ratio, Final Prediction Error, AIC, SC, and HQ). This means that including one lag of the endogenous variables (REXR, MS, RGDP, INTR, INFR, CRPS) provided the best balance between model fit and parsimony, capturing the dynamic interrelationships among the variables without overfitting the model.

4.3. Cointegration Test

Table 4.3: Summary of ARDL Bounds Test

Test Statistic		**Value**
F-statistic		**1.278976**
Sample Size	**5% Critical Value I(0)**	**5% Critical Value I(1)**
35	2.804	**4.013**
40	2.734	**3.920**
Asymptotic	**2.390**	**3.380**

Source: Author's computation using Eviews 13

The result of the ARDL Bounds test is presented in Table 4.3. From the result, the F-Statistic of 1.279 is lower than the lower and upper bound of 2.73 and 3.92 respectively at 5 per cent level of significance. This shows that there is no long run relationship among all the variables. Based on this, the short run ARDL model was conducted and the result is presented in Table 4.4.

4.4. Estimation Test

From the short run result (Table 4.4), the coefficient of cointegrating equation was -0.410 with p value of 0.000. This implied that 41% of any short-run deviation from long-run equilibrium was corrected each period. The coefficients of MS and INTR stood at 0.376 and 0.855 respectively, meaning that 1% increase in MS and INTR increased real exchange rate by 0.37% and 0.86%. On the contrary, real GDP, INFR and CRPS were negatively related to real exchange rate, indicating that 1% increase in RGDP, INFR and CRPS decreased REXR by -2.98%, -0.05% and -0.58% respectively.

Table 4.4: Short-run ARDL

Dependent Variable: D(REXR)				
Method: ARDL				
Sample: 1987 2023				
Included observations: 37				
Max. dependent lags: 1 (Fixed)				
Fixed-lag linear regressors: MS RGDP INTR INFR CRPS				
Deterministics: Restricted constant and no trend (Case 2)				
Selected model: ARDL(1,1,1,1,1,1)				
Variable	Coefficient	Std. Error	t-Statistic	**Prob.**
COINTEQ*	-0.410147	0.076879	-5.334933	**0.0000**
D(MS)	0.376347	0.324283	1.160554	**0.2547**
D(RGDP)	-2.975552	0.895382	-3.323223	**0.0023**
D(INTR)	0.854745	0.210594	4.058733	**0.0003**
D(INFR)	-0.048821	0.058624	-0.832783	**0.4113**
D(CRPS)	-0.576101	0.237250	-2.428248	**0.0212**
R-squared	0.581139	Durbin-Watson stat		**2.393860**
Adjusted R-squared	0.513581			
F-statistic	8.602048			
Prob(F-statistic)	0.000034			
*** p-values are incompatible with t-Bounds distribution.**				

Source: Author's computation using Eviews 13

The results further revealed that RGDP, INTR and CRPS were statistically significant while MS and INFR were insignificant. The R2 showed that 58% variations in REXR were accounted for by MS, RGDP, INTR, INFR and CRPS. The F-statistic however indicated a joint significance of the variables with the value of 8.6020 which is greater than the tabulated F-statistic at 5% level of significance.

4.5. Post Estimation Tests

Table 4.5: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:			
Null hypothesis: No serial correlation at up to 1 lag			
F-statistic	2.864185	Prob. F(1,24)	**0.1035**
Obs*R-squared	3.944838	Prob. Chi-Square(1)	**0.0670**

Source: Author's computation using Eviews 13

The Breusch-Godfrey Serial Correlation LM Test reported an F-statistic of 2.864 with a p-value of 0.1035. The F-statistic showed the strength of evidence against the null hypothesis of no serial correlation, meaning we failed to reject the null hypothesis and concluded that there is no strong evidence of serial correlation in the residuals.

Stability Test

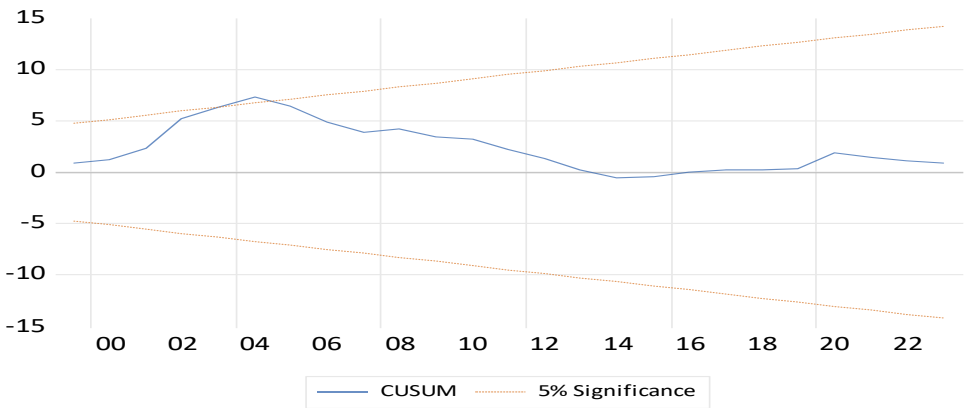

Figure 4.1: Cumulative Sum Test

Source: Author's computation using Eviews 13

The results in Figure 4.1 reveals that the model is stable since the base lines fall within the 5 percent boundary level. Based on the decision rule, the study accepts the null hypothesis which states that the model is stable.

4.6. Discussion of Findings

According to the results, money supply and interest rates were found to have a positive relationship with the real exchange rate. These suggest that increases in money supply may be responsible for domestic liquidity and currency pressures, whereas higher interest rates may have attracted foreign capital flows, leading to short-run appreciation of the exchange rate. These are consistent with the findings of Adenigbagbe et al. (2024) and Zulu and Paul (2008), which indicated that money supply has a positive influence on exchange rates. Conversely, real GDP, inflation, and private sector credit had a negative relationship with the real exchange rate. This implies that foreign exchange supply and production activity increased due to improved domestic output and greater availability of private sector credit in favour of currency appreciation. The inflation impact was negative and statistically insignificant, indicating that short-run price adjustments did not influence the real exchange rate to any significant extent. This result aligns with Ahmed and Rafar (2009), whose research found that real sector and credit variables contributed significantly towards Nigerian exchange rate stability. The level of significance determined that real GDP, interest rate, and private sector credit were statistically significant determinants of the short-run real exchange rate while money supply and inflation were not, suggesting that short-run exchange rate variability was more responsive to output, financial development, and interest rate changes than to immediate monetary or price effects. Strong explanatory power and joint significance of variables were also determined by the model.

5. Conclusion and Policy Recommendations

Based on the short-run results, the study established that monetary policy variables significantly influenced exchange rate movements in the country. The money supply and interest rate exerted positive effects on the dynamics of exchange rate in Nigeria, indicating that expansionary monetary measures such as increasing money supply or lowering interest rates tend to drive up the exchange rate by exerting depreciation pressure on the domestic currency. Conversely, real GDP, inflation and credit to private sector negatively affected the real exchange rate, suggesting that improvements in output performance, stable prices, and credit allocation strengthened the domestic currency. Furthermore, RGDP, INTR, and CRPS were statistically significant predictors of exchange rate changes, while MS and INFR showed no significant effect.

Policy Recommendations

i. Since money supply expansion exerted depreciation pressure on the exchange rate, the CBN should adopt a cautious

and well-targeted monetary expansion, ensuring liquidity growth aligns with productive capacity to prevent excessive exchange rate volatility.

ii. Given the positive and significant influence of interest rate on the exchange rate, the CBN should maintain a stable and market-reflective interest rate regime that discourages speculative capital flows and supports exchange rate stability.

iii. As real GDP negatively influenced the exchange rate, the government should intensify policies that enhance industrial output, agricultural productivity, and infrastructure development to boost foreign exchange earnings and strengthen the domestic currency.

iv. Since credit to the private sector contributed to exchange rate stability, the CBN should implement policies that expand access to affordable credit for productive activities, especially in export-oriented and import-substituting sectors.

v. Although inflation was not statistically significant, its negative relationship suggests that controlling inflation can indirectly support exchange rate stability. The CBN should strengthen monetary and fiscal coordination to achieve low and stable inflation.

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