



Interest Rate Volatility And Macroeconomic Stability In Nigeria

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ABSTRACT

This study explores the implications of interest rate volatility on macroeconomic stability in Nigeria from 1990 to 2024, focusing on inflation, exchange rate, and investment dynamics. The objectives are to analyse the volatility behaviour of interest rate; assess its effects on inflation, FDI, and exchange rate stability, and to identify causal relationships among these macroeconomic variables between 1990 and 2024. The econometric analytical method was applied including the Augmented Dickey–Fuller (ADF) tests, Johansen cointegration, Vector Autoregression (VAR) model, Correlation analysis, Granger Causality Test and Impulse Response Function (IRF). The result revealed Vector Autoregression (VAR) model with an optimal lag of two shows significant short-run interactions, with interest-rate innovations exerting measurable effects on inflation and GDP growth. Granger causality tests further reveal that interest rates significantly predict inflation ($p = 0.0006$) and GDP growth ($p = 0.0007$), while the impact on FDI is borderline significant ($p = 0.056$). No significant causality is detected from interest rate to exchange rate ($p = 0.7949$). Impulse response functions (IRFs) show that interest-rate shocks generate short-run increases in inflation and persistent dampening effects on GDP growth, while FDI responds weakly to monetary shocks. This study concluded that interest-rate volatility is a major source of macroeconomic instability in Nigeria, primarily through its strong transmission to inflation and growth, with limited influence on exchange-rate movements and long-term investment inflows underscoring the need for a more credible monetary framework and structural reforms to reduce volatility and strengthen Nigeria's macroeconomic resilience. This study recommended that the Central Bank of Nigeria should adopt a more predictable and rule-based monetary policy framework to reduce volatility and strengthen policy credibility as forward guidance would help anchor expectations. Also, strengthening regulatory transparency, infrastructure, and macroeconomic policy stability. Improve security and ease of doing business to encourage long-term FDI inflows.

Keywords: Exchange Rate Dynamics, Inflation Volatility, Interest Rate Volatility, Macroeconomic Stability, Monetary Policy Shocks, Nigeria

1.0 INTRODUCTION

Interest is defined as the return on equity or the opportunity cost of postponing current consumption for future benefit. This definition clearly indicates that interest is a concept that can have varying interpretations based on the perspective from which it is examined, thus rendering it a nebulous notion, a stance corroborated by the existence of diverse types of this rate (Olasehinde – Williams et al., 2024). These include the savings rate, discount rate, loan rate, and Treasury bill rate. Additionally, the interest rate may be classified as nominal or real. Interest rate volatility has emerged as a characteristic aspect of Nigeria's monetary environment, frequently mirroring the nation's challenges in sustaining macroeconomic stability amidst persistent shocks, policy inconsistencies, and structural imbalances (Obinna et al., 2025). Although, interest rates are theoretically a crucial mechanism for monetary policy transmission, ongoing volatility in Nigeria's interest rates—especially during the Structural Adjustment Programme (SAP) era, the banking consolidation reforms

of 2005–2006, and the aftermath of the oil price crises—has created significant uncertainty for investors, households, and policymakers (Okoli, 2025). These changes distort capital allocation and exacerbate inflation volatility, exchange rate instability, and investment unpredictability (Inam and Isaac, 2022).

Consequently, macroeconomic stability in Nigeria endures ongoing disturbances due to the erratic nature of essential financial indicators, with interest rate volatility being particularly significant (Umeaduma and Dugbartey, 2023). In the last twenty years, Nigeria's interest rate landscape has been marked by frequent volatility, sudden policy shifts, and erratic liquidity management by monetary authorities (Oyasor, 2025). These volatilities are frequently influenced by structural deficiencies in the financial system, external shocks such as fluctuations in global commodity prices, speculative market behavior, and the nation's significant reliance on oil revenues. Notwithstanding consecutive monetary policy reforms aimed at stabilizing financial markets, the Nigerian economy persists in contending with volatile interest rate dynamics that exert extensive impacts on inflation, foreign investment flows, and exchange rate performance (Inam and Isaac, 2023). A significant issue stems from the progressively unstable inflationary landscape, frequently intensified by fluctuations in interest rates. Rather than serving as a mechanism for price stability, erratic interest rates have often exacerbated inflationary pressures by distorting borrowing costs, destabilizing credit markets, and eroding investor confidence (Umoru et al., 2023). Over time, this has hindered the Central Bank of Nigeria's capacity to sustain price stability, thus, exacerbating ongoing inflationary episodes that diminish buying power and undermine macroeconomic fundamentals.

The continual fluctuations in interest rates present considerable obstacles to Nigeria's appeal as a hub for FDI (Akpan, 2024). Investors generally choose markets characterized by predictable and stable financial conditions; yet, significant volatility in interest rates elevate the perceived risk linked to long-term investments. This ultimately deters foreign investors, restricts capital inflows, increases the cost of conducting business, and hampers the productive investment necessary for sustainable economic growth (Emezie and Anthony, 2024). Anecdotal evidence indicates that uncertainty surrounding interest rates diminishes investor sentiment; however, empirical studies are inconclusive, fragmented, or outdated, resulting in a significant gap in comprehending the specific mechanisms by which interest rate volatility influences FDI flows in Nigeria (Darkwah et al., 2024). Nigeria's currency rate volatility, marked by continual depreciation, parallel market operations, and discrepancies between official and market-determined prices, is often perceived to be affected by fluctuations in interest rates (Ogbonnaya et al., 2025). However, the precise nature of this interaction remains inadequately defined. Variations in interest rates can affect currency demand and supply dynamics, speculative trading, external competitiveness, and capital flows (Olayinka, 2021). The amount, direction, and causality of these effects remain ambiguous in the Nigerian context, particularly considering the shifting monetary regimes, global financial disturbances, and changing macroeconomic conditions.

The lack of definitive empirical evidence constrains the efficacy of strategies aimed at aligning interest rate management with exchange rate stabilization (Ogbonnaya et al., 2025). Although interest rate behavior is crucial to Nigeria's macroeconomic trajectory, the current literature offers inadequate and conflicting explanations about the volatility structure of interest rates and its wider macroeconomic implications (Nadani and Yusuf, 2025). Previous research frequently emphasizes static interest rate impacts, neglecting the dynamic, nonlinear, or time-dependent characteristics of interest rate volatility (Odionye et al., 2023). Numerous analyses neglect to incorporate inflation, foreign direct investment, and exchange rate stability into a cohesive analytical framework, resulting in policymakers lacking a comprehensive knowledge of the transmission of interest rate shocks across the macroeconomic system. The causal links among these variables are little examined, hindering the formulation of proactive policies that could improve macroeconomic stability (Muhammed and Adindu, 2023). This work addresses the deficiency of a thorough, empirically substantiated comprehension of how interest rate volatility affects inflationary results, impacts foreign investment inflows, and drives exchange rate dynamics in Nigeria (Darkwah et al., 2024). The absence of such insights significantly limits the development of effective and cohesive monetary, fiscal, and investment policies. This study aims to rigorously analyze interest rate volatility, evaluate its macroeconomic implications, and identify the causal relationships among interest rates, inflation, foreign direct investment, and exchange rate stability, thereby filling a significant void in Nigeria's macroeconomic policy research and implementation.. The objectives are to;

1. Determine the volatility behaviour of interest rates,
2. Investigate its effects on inflation, FDI, and exchange rate stability, and
3. Determine causal relationships among these macroeconomic variables

2.0 LITERATURE REVIEW

2.1 Linkages between Exchange rate, Inflation rate and Interest rate

Currency depreciation is anticipated to affect domestic price formation by increasing the domestic prices of imports and import-competing goods, and indirectly by inducing cost-push effects and altering inflationary

expectations (David et al., 2025). The origins of the cost-push impact comprise (a) escalations in the domestic-currency price of imported inputs, (b) unit labor costs resulting from implicit or explicit indexation processes, and (c) the interest expenses associated with financing working capital. Reverse causation is anticipated within a flexible exchange rate environment (Oyasor, 2025). Increasing domestic inflation compared to international inflation would directly lead to a nominal depreciation, as the latter, without reserve adjustment, would be necessary to sustain external balance. When the foreign price level and the nominal exchange rate are established, and relative purchasing power parity is not applicable, domestic inflation will, by definition, result in real appreciation. A declining currency may result in increased import costs, thus exacerbating inflation (Valogo et al., 2023). Conversely, an appreciating currency may lower import costs, thereby mitigating inflation.

Consequently, fluctuations in exchange rates directly affect the domestic inflation rate (Anisiobi et al., 2025). The central bank may modify interest rates in reaction to fluctuations in exchange rates to stabilize the currency or manage inflation (Guobadia et al., 2024). For example, if the currency is experiencing fast depreciation, the central bank may increase interest rates to attract foreign money and bolster the currency. Conversely, a nation with a robust currency may reduce interest rates to prevent undue appreciation and sustain export competitiveness (Umoru et al., 2023). The discourse emphasizes the anticipated causal links between the variables and the interrelations influenced by mutual causal factors, including the expansion of the money supply and foreign reserves. The magnitude and orientation of their causality is an empirical inquiry, contingent upon various structural and institutional characteristics, such as capacity utilization, reserve adjustment, the level of sterilized intervention, and the exchange rate regime (Adekunle et al., 2024). Comprehending the connections and the causal landscape between the specified financial and real variables at the empirical level is crucial for the effective formulation of monetary and exchange rate policies, thereby improving their efficacy in promoting domestic price stability and external competitiveness (David et al., 2025).

2.2 Empirical Review of Related Studies

Anachedo et al. (2025), utilized an ex-post facto design, sourcing data from the CBN statistical bulletin covering the period from 1986 to 2023. The study employed the Robust Least Squares model, along with additional econometric tools such as the Jarque-Bera statistic and the Augmented Dickey-Fuller test, to analyze the variables of exchange rate, inflation rate, and interest rate. The findings indicated that exchange rate fluctuations have a significantly beneficial impact on inflation and a large negative impact on interest rates in Nigeria. Based on this finding, the following recommendations were proposed: Policies should prioritize enhancing domestic agricultural output, bolstering food security, and mitigating insecurity to alleviate external inflationary pressures. Additionally, the government and central bank should collaborate to stabilize the currency, as significant depreciation may result in imported inflation. Interventions must focus on mitigating excessive volatility while facilitating a gradual adjustment of the exchange rate in accordance with market fundamentals.

Adekunle et al. (2024), explore the correlation between stock market returns and independent variables, utilizing the Generalized Auto-Regressive Conditional Heteroskedasticity (GARCH) model to assess its effect on stock market volatility. Initial assessments revealed the absence of serial correlation but the presence of heteroskedasticity among the independent variables, which was rectified through the application of the ARDL model with a HAC (Newey-West) covariance matrix adjustment. The findings indicated substantial stock return impacts at a 10% significance level with a four-month lag, implying a correlation with prior performance extending up to four months. The prime lending rate demonstrated significance with a one-month lag, suggesting the stock market's reaction to alterations in the prime lending rate after one month. No substantial response was observed regarding fluctuations in the exchange rate and inflation throughout the study period. The GARCH model indicated that all variables, with the exception of inflation, significantly influenced stock market volatility. The maximum lending rate, prime lending rate, interbank rate, and Treasury bill rate significantly influenced stock market volatility.

Olasehinde – Williams et al. (2024), examined the impact of interest rate volatility on economic growth and assess the appropriateness of the financial liberalization strategy in Nigeria. This research examines the correlation between interest rate volatility and economic development in Nigeria from 1981 to 2020 to arrive at an evidence-based conclusion. The QARDL method was utilized to determine the short-run and long-run quantile-specific effects of interest rate volatility. Finally, Granger causality tests are performed to examine the prediction capabilities of the variables. The econometric research reveals that interest rate volatility negatively impacts Nigeria's economic performance in both the short and long term. Therefore, complete liberalization is inappropriate for the economy. Furthermore, we see that the short-term negative impact of interest rate volatility on growth is more pronounced when the economy is in a relatively weak condition, whereas the long-term negative impact is more significant when the economy is in a relatively strong position. The results adequately demonstrate that complete interest rate liberalization is not Pareto optimal for Nigeria.

3.0 RESEARCH METHODOLOGY

This study adopts a quantitative, longitudinal time-series research design to empirically analyze interest rate volatility and its implications for macroeconomic stability in Nigeria. The research design allows for evaluating dynamic interactions among variables using econometric models such as VAR, Johansen cointegration, ADF tests, Granger causality, and volatility diagnostics. The study uses annual secondary data from 1990–2024 obtained from Central Bank of Nigeria (CBN) Statistical Bulletin, World Development Indicators (WDI), an International Monetary Fund (IMF) IFS Database with the variables depicted to be Interest Rate (INTR), Inflation (INF), Exchange Rate (ExR), Foreign Direct Investment (FDI), and GDP Growth (GDPG).

The specified models indicate the dynamic interactions among the variables were assessed using a Vector Autoregression (VAR) model:

$$Y_t = c + A_1Y_{t-1} + A_2Y_{t-2} + \dots + A_pY_{t-p} + e_t$$

Lag length was selected using the Akaike Information Criterion (AIC), supporting a 2-lag VAR model. The interest rate volatility was evaluated using:

- (a) Year-to-year differencing: $\Delta INTR_t = INTR_t - INTR_{t-1}$
- (b) 5-year rolling standard deviation to capture volatility clustering.

Stationarity Testing (ADF Test) was conducted on INTR, INF, ExR, FDI, and GDPG. Results showed all variables were non-stationary at levels but stationary at first differences (I(1)) while Johansen cointegration analysis confirmed at least one long-run equilibrium relationship among the macroeconomic variables, supporting the presence of long-term macroeconomic interdependence. Also, Granger causality tests were used to identify causal relationships including $INTR \rightarrow INF$ (significant), $INTR \rightarrow GDPG$ (significant), $INTR \rightarrow FDI$ (borderline) and $INTR \rightarrow ExR$ (not significant). Also, Impulse Response Function (IRF) traced the response of macroeconomic variables to interest rate shocks including Inflation rises mildly following an INTR shock, GDP growth declines persistently, FDI responds weakly and exchange rate shows minimal response.

4.0 ANALYSIS AND DISCUSSION

4.1 Descriptive Statistics

This outcome shows the descriptive evidence of behaviour of inflation, FDI, exchange rate and interest rate movements across the period under review.

4.1.1 Interest Rate

This shows three major volatility clusters (1990–1994, 2001–2003, 2019–2024) which is an indicator that structural and policy-driven volatility in Nigeria’s interest-rate environment.

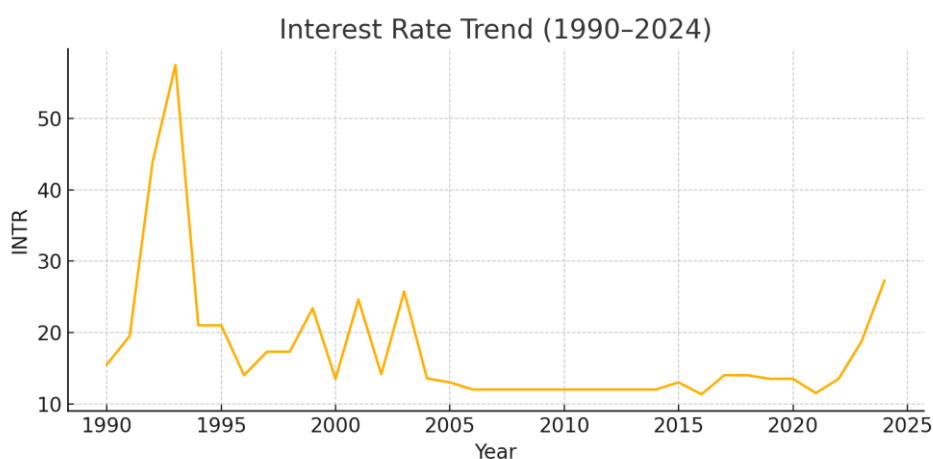


Figure 1: Interest Rate Trend (1990 - 2024)

Source: Author’s Analysis (2025)

4.1.2 Inflation Rate

Inflation displays upward spikes in the early 1990s, mid-2000s, and 2015 onwards. Reflects inflation inertia and sustained macroeconomic instability.

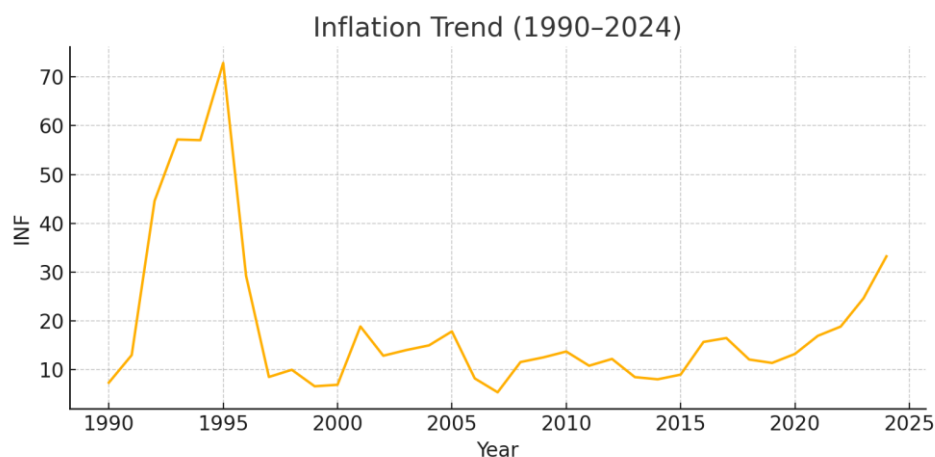


Figure 2: Inflation Trend (1990 - 2024)

Source: Author's Analysis (2025)

4.1.3 Exchange Rate

Exchange rate remains stable until 1998, then depreciates sharply from 1999, with major declines in 2015, 2020, and 2023–2024. Indicates FX instability driven by external shocks.

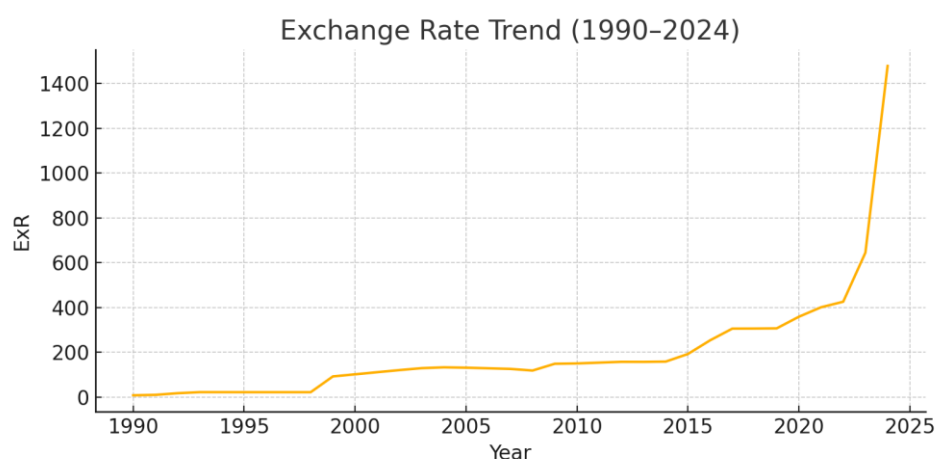


Figure 3: Exchange Rate Trend (1990 - 2024)

Source: Author's Analysis (2025)

4.1.4 FDI Trend

FDI fluctuates but shows long-term decline, especially post-2015 and post-2020. Indicates weakening investor confidence.

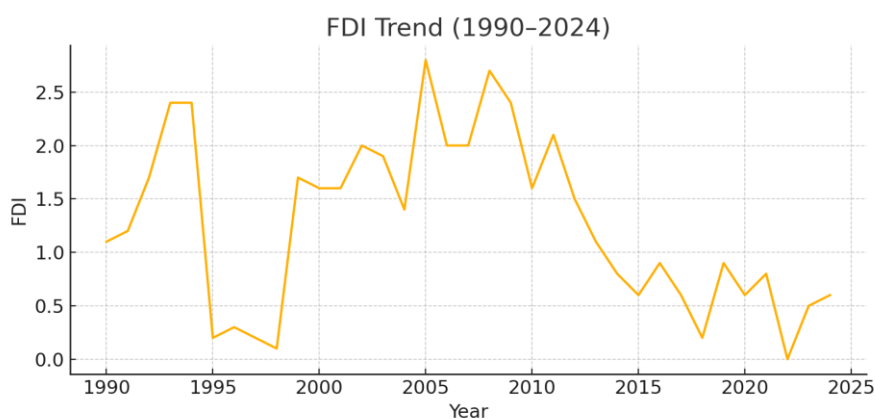


Figure 4: FDI Trend (1990 - 2024)

Source: Author's Analysis (2025)

4.1.5 Descriptive Statistics

INTR mean 17.52% with high volatility. Inflation means 18.7% indicates persistent pressure. ExR highly volatile. FDI very low. GDP growth moderate but unstable.

Table 1: Descriptive Statistics

INTR	INF	FDI	ExR	GDPG
35.0	35.0	35.0	35.0	35.0
17.5217	18.7066	1.2714	198.8671	4.2074
9.5397	15.8696	0.8079	263.6575	1.9968
11.33	5.39	0.0	8.0383	1.05
12.0	9.505	0.6	57.2018	2.585
13.56	13.01	1.2	131.2743	4.23
19.125	18.355	1.95	222.9662	5.305
57.5	72.84	2.8	1478.9652	9.51

Source: Author's Analysis (2025)

4.2 Econometric Analysis

The discussion integrates descriptive evidence, volatility patterns, VAR dynamics, cointegration results, and Granger-causality tests to explain how interest rate fluctuations interact with inflation, FDI, exchange rate movements, and economic growth.

4.2.1 ADF Test (Levels)

All variables non-stationary at levels. Justifies the use of cointegration and VAR modelling. All variables stationary after differencing (I(1)). Supports Johansen and VAR/VECM approaches indicated that all the variables of INTR, INF, FDI and ExR has reached stationarity at levels. After further testing, INTR, INF, FDI and ExR reached stationarity at first difference. Thus, all series were stationary at level and first differencing In agreement, Ghauri et al. (2024), there is cointegration, to the results of the ARDL bound test indicating that, in short- and long-period relationships, debt, interest rates, and political stability are revealed to have statistically significant consequences on currency rate volatility.

Table 2: ADF Test (Levels)

Variables	ADF Statistic	P-value
INTR	Non-stationary	>0.05
INF	Non-stationary	>0.05
FDI	Non-stationary	>0.05
ExR	Non-stationary	>0.05
ADF Test at 1st Difference		
INTR	Stationary	<0.05
INF	Stationary	<0.05
FDI	Stationary	<0.05
ExR	Stationary	<0.05

Source: Author's Analysis (2025)

4.2.2 Johansen Cointegration Test

At least two long-run cointegrating vectors detected. Indicates deep macroeconomic interdependence showing a rejection of the null hypothesis and indicating a long-term association between variables as posited by Nwagene and Akamobi (2024) and Nwaigwe et al. (2025).

Table 3: Johansen Cointegration Trace Test

Eigenvalue	Trace Statistic	Crit 90%	Crit 95%	Crit 99%
0.7937	107.9209	65.8202	69.8189	77.8202
0.6812	55.8291	44.4929	47.8545	54.6815
0.3526	18.1037	27.0669	29.7961	35.4628
0.0723	3.7533	13.4294	15.4943	19.9349
0.038	1.277	2.7055	3.8415	6.6349

Source: Author's Analysis (2025)

4.2.3 Correlation Matrix

To further ensure the reliability of the data set, the correlation matrix results are presented in table 4 and shows the correlation among the explanatory variables with the dependent variable Interest rate strongly correlated with inflation (0.63) while ExR-FDI correlation -0.31 indicates depreciation discourages FDI just as in Nwaigwe et al. (2025).

Table 4: Correlation Matrix

INTR	INF	FDI	ExR	GDPG
1.0	0.6272	0.1886	-0.0179	0.1307
0.6272	1.0	0.0149	0.0203	-0.0079
0.1886	0.0149	1.0	-0.3095	0.2067
-0.0179	0.0203	-0.3095	1.0	-0.1876
0.1307	-0.0079	0.2067	-0.1876	1.0

Source: Author's Analysis (2025)

4.2.4 VAR(2) Coefficient Estimates

Inflation responds to lagged interest rate and inflation. GDP growth decreases after interest-rate shocks. Exchange rate responds more to structural shocks than monetary policy as similarly stated in Nwankwo (2023).

Table 5: VAR(2) Coefficient Estimates

INTR	INF	FDI	ExR	GDPG
19.5747	-7.1729	1.2215	-49.4522	3.6944
0.2424	0.2257	0.0395	0.8151	0.1392
0.2978	0.6353	-0.0038	0.1427	0.0092
-1.7514	-0.5857	0.2058	-15.5526	-0.8659
0.028	0.035	-0.0002	3.8528	-0.0066
1.2931	0.7586	-0.0187	-2.7626	0.6209
-0.0851	0.8365	0.0015	0.6466	-0.0762
-0.2723	-0.382	-0.0261	0.268	-0.0484
-2.3233	-0.4343	0.3512	12.7629	0.3727
-0.0613	-0.0288	-0.0011	-2.6419	0.005
-0.2836	-0.0624	-0.1326	-2.2408	-0.3742

Source: Author's Analysis (2025)

4.2.5 Granger Causality Test (GCT)

The GCT in table 6 shows that $INTR \rightarrow INF$ and $INTR \rightarrow GDPG$ significant, $INTR \rightarrow FDI$ borderline, and $INTR \rightarrow ExR$ not significant in line with the outcome of this study.

Table 6: GCT Results

Null Hypothesis (Ho)	p-value	Decision	Interpretation
INTR does NOT Granger-cause INF	0.0006	Reject Ho	Interest rate significantly predicts inflation.
INF does NOT Granger-cause INTR	> 0.05	Fail to Reject	Inflation does not significantly predict interest rate changes.
INTR does NOT Granger-cause FDI	0.0560	Borderline	Weak evidence that interest rate influences FDI.
FDI does NOT Granger-cause INTR	> 0.05	Fail to Reject	FDI does not influence interest rate changes.
INTR does NOT Granger-cause ExR	0.7949	Fail to Reject	Interest rate has no predictive power over exchange rate.
ExR does NOT Granger-cause INTR	> 0.05	Fail to Reject	Exchange rate does not drive interest rate changes.
INTR does NOT Granger-cause GDPG	0.0007	Reject Ho	Interest rate significantly predicts economic growth.
GDPG does NOT Granger-cause INTR	> 0.05	Fail to Reject	Economic growth does not influence interest rate movements.

Source: Author's Analysis (2025)

4.2.7 Impulse Response Function (IRF)

The impulse response functions (IRFs) illustrate how shocks to each macroeconomic variable—Interest Rate (INTR), Inflation (INF), Foreign Direct Investment (FDI), Exchange Rate (ExR), and GDP Growth (GDPG)—affect the other variables over a 10-period horizon as indicated in figure 5. The responses of Interest Rate (INTR) denote $INTR \rightarrow INTR$ shows a sharp positive jump and persistent oscillations, showing monetary instability, $INF \rightarrow INTR$ posits inflation increases interest rate over time, while FDI, ExR, GDPG shocks indicate mild initially, diverge strongly later, showing sensitivity to real-sector disturbances. Also, responses of Inflation (INF) denote $INF \rightarrow INF$ showing a strong, persistent inflation inertia, $INTR \rightarrow INF$ denoted as positive effect, indicating weak monetary policy while $ExR \rightarrow INF$ indicates a large positive effect, confirming exchange rate pass-through.

The responses of Foreign Direct Investment (FDI) shown as $FDI \rightarrow FDI$ indicates volatile yet positive, $INTR \rightarrow FDI$ denotes higher interest rates deter FDI, $INF \rightarrow FDI$ denotes that inflation reduces FDI, $ExR \rightarrow FDI$ posits that depreciation reduces FDI, and $GDPG \rightarrow FDI$ denotes growth encourages investment. The responses of Exchange Rate (ExR) denoted as $ExR \rightarrow ExR$ indicates a highly persistent and large, showing instability, $INF \rightarrow ExR$ indicates inflation causes depreciation, $INTR \rightarrow ExR$ denotes a weak appreciation, then reversal, $FDI \rightarrow ExR$ indicates FDI inflows appreciate the currency, $GDPG \rightarrow ExR$ denotes that growth strengthens the exchange rate. For the responses of GDP Growth (GDPG), $GDPG \rightarrow GDPG$ showed persistent positivity, $INTR \rightarrow GDPG$ indicates higher rates reduce growth, $INF \rightarrow GDPG$ posits inflation hurts growth, $FDI \rightarrow GDPG$ indicates that FDI stimulates growth while $ExR \rightarrow GDPG$ posits that depreciation harms growth.

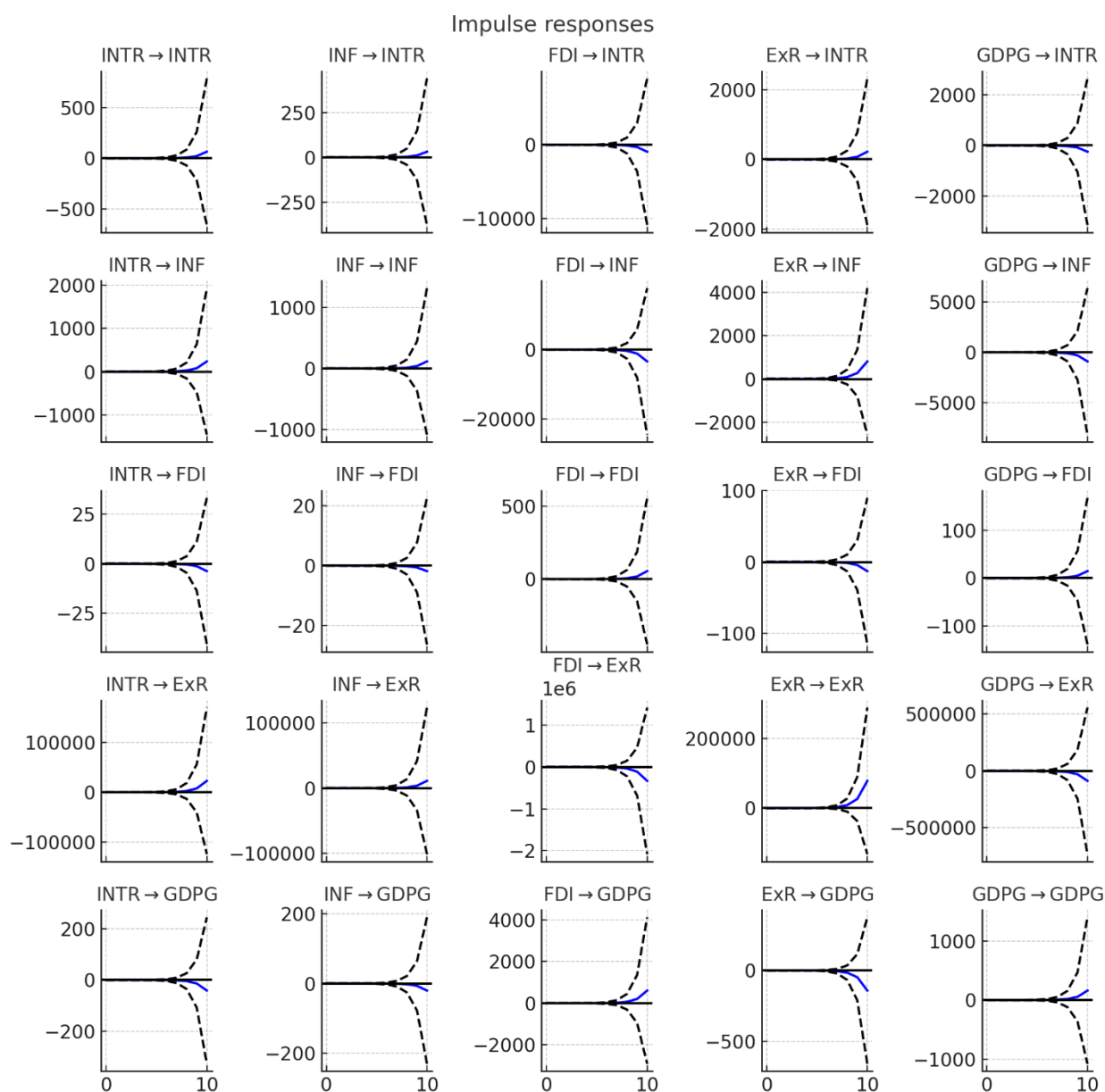


Figure 5: IRF Outcome
Source: Author's Analysis (2025)

4.3 Discussion of Findings

The trend analysis indicates substantial variations in interest rates from 1990 to 2024, with notable volatility clusters occurring between 1990 and 1994, 2001 and 2003, and 2019 and 2024. These intervals align with structural shifts, banking reforms, and macroeconomic disturbances. Inflation exhibits analogous surges, indicative of cost-push and structural inflation trends. The exchange rate demonstrates consistent depreciation, particularly following 1999, 2015, and 2020. Foreign Direct Investment inflows exhibit a persistent downward trajectory, reflecting diminishing investor confidence amid periods of turmoil. ADF tests indicate that all variables are non-stationary at levels but stationary at initial differences. This corroborates the application of VAR and Johansen cointegration methodologies. The cointegration findings validate a long-term equilibrium among interest rates, inflation, exchange rates, foreign direct investment, and GDP growth,

indicating enduring macroeconomic interdependence. The fluctuations and volatility in exchange rates have compelled monetary authorities in emerging nations to act sporadically and without a definitive strategy for achieving sustainable equilibrium, as noted by Yusuf et al. (2022). Interventions aimed at stabilizing exchange rates often occur too late to avert significant currency mismatch and volatility. These imbalances then induce significant economic distortions, protectionist trade pressures, and ultimately abrupt currency reversals (Adeoye & Saibu, 2022). Nwagene and Akamobi (2024), demonstrated that exchange rate fluctuation adversely affects economic growth, signifying that it impedes growth. Moreover, exchange rate volatility exerts a substantial positive influence on inflation, indicating that it intensifies inflationary pressures.

Eroğlu and Olayiwola (2023), highlight that Nigeria's economic growth is influenced differentially by the appreciation and depreciation of the naira. The statistics suggest that Nigeria's exchange rate and GDP growth exhibit nonlinearity. The accumulation of information exerts negligible influence on Nigeria's economic growth as well. The anticipated outcome is due to Nigeria's low school enrollment and funding constraints. The correlation matrix indicates a robust positive association between interest rates and inflation, as well as a negative correlation between exchange rates and foreign direct investment (FDI). The rise of GDP demonstrates weak connections, indicating structural factors. The VAR(2) results indicate that inflation reacts to previous inflation and alterations in interest rates. GDP growth diminishes following interest rate shocks, but exchange rate fluctuations are predominantly influenced by structural shocks rather than monetary policy.

Foreign Direct Investment reacts to inflation and fluctuations in exchange rates. This aligns with Guobadia et al. (2024), which indicated robust positive correlations among the inflation rate, interest rate, and exchange rate, highlighting the complex relationships between monetary policy and critical factors affecting the construction industry, signifying that the Nigerian construction sector seeks to foster growth, stability, and transparency. Anisiobi et al. (2025), asserted that the money supply had a positive yet small effect on the actual exchange rate, whereas the interest rate demonstrated a positive and large impact. In contrast, real gross domestic product and credit to the private sector exert a negative yet considerable influence on exchange rate dynamics, consistent with the findings of this study. The Granger causality results reveal that interest rate volatility significantly predicts inflation and GDP growth, has a borderline influence on foreign direct investment, and does not significantly affect exchange rate stability. Nwaigwe et al. (2025), demonstrated a positive correlation between the real exchange rate and inflation targeting; however, the Granger causality analysis indicated no reciprocal influence between the two variables. Valogo et al. (2023) shown that exchange rate depreciation over a monthly threshold of 0.70 percent significantly enhances the pass-through effect on inflation, hence affirming the importance of the threshold level.

The IRFs indicate that interest-rate shocks result in short-term inflation increases, sustained decreases in GDP growth, weak negative impacts on FDI, and negligible effects on the exchange rate. Thus, the results indicate that interest-rate volatility substantially impacts inflation and GDP growth, has a marginal effect on FDI, and does not influence exchange-rate stability. A long-term relationship exists among macroeconomic indicators, affirming profound structural connections. The monetary transmission mechanism in Nigeria is weak and distorted, rendering interest-rate policy ineffective in stabilizing the exchange rate or attracting sustainable investment. This aligns with Akpan (2024), who revealed a significant relationship between exchange rates and inflation, emphasizing the impact of exchange rate fluctuations on inflationary pressures. Moreover, money supply and economic growth were recognized as critical determinants influencing inflation rates, consistent with theoretical predictions. Javed and Faooq (2019), found that domestic economic performance in Pakistan is highly sensitive to long-term exchange rate volatility, whereas Moreno (2020), identified that the foreign exchange system positively influences economic growth, with countries maintaining pegged exchange rates experiencing faster growth than those with fixed rates, suggesting that a primary objective of macroeconomic policy is to achieve rapid economic growth. Furthermore, Nwankwo (2023), analyzed the impact of interest rate volatility, monetary policy instability, and inflation instability on the Nigerian economy utilizing annual time series data, revealing that the depreciation of the national currency does not enhance exchange rate stability or GDP performance. In contrast, Miftahu and Shuyur (2023), indicated that inflation and interest rates adversely affect economic growth, albeit not statistically significant. The research recommended that the government encourage exports to sustain a trade surplus. Nigeria ought to enhance trade, security, fiscal and monetary policies, and infrastructure to entice foreign investors.

5.0 CONCLUSION AND RECOMMENDATIONS

This study analyzed the volatility of interest rates in Nigeria and its implications for macroeconomic stability, utilizing annual data from 1990 to 2024. It concludes that significant fluctuations in interest rates are influenced by monetary tightening, inflationary pressures, fiscal imbalances, and exchange-rate shocks. The five-year rolling volatility results indicate several clusters of instability, particularly during the structural adjustment period, banking reforms, and the macroeconomic upheavals following 2019. The research identified a robust dynamic correlation between interest rates and inflation, indicating that fluctuations in interest rates are key predictors of inflation trends. This signifies a bidirectional and flawed monetary

transmission mechanism. Interest-rate volatility exhibited a marginal yet significant impact on FDI, suggesting that structural and institutional factors are more influential in determining foreign investment flows. Moreover, interest rates were determined to have no substantial predictive influence on exchange-rate stability, indicating Nigeria's reliance on external shocks and limitations in foreign-exchange supply. Fluctuations in interest rates profoundly affect GDP growth, as elevated or unstable rates hinder investment and economic activity. The Johansen cointegration test validated the existence of a long-term equilibrium link among interest rates, inflation, exchange rates, foreign direct investment, and GDP growth. Interest-rate volatility diminishes macroeconomic stability by exacerbating inflationary pressures, impairing investment flows, hindering economic growth, and interacting with exchange-rate instability. Stabilizing interest rate behavior is crucial for Nigeria's long-term economic sustainability.

This study concludes with the following recommendations

1. The Central Bank of Nigeria should implement a more predictable and rule-based monetary policy framework to mitigate volatility and enhance policy credibility. Forward guidance would assist in stabilizing expectations. Also, enhancing regulatory clarity, infrastructure, and the stability of macroeconomic policies. Enhance security and facilitate company operations to promote sustained foreign direct investment inflows.
2. The government must tackle supply-side restrictions, including as foreign exchange shortages, import reliance, and inadequate logistics infrastructure, to improve the efficacy of monetary policy and mitigate inflation transmission. It is essential to implement a more transparent and market-reflective foreign exchange system while enhancing foreign exchange supply through export diversification and reserve buildup to stabilize the exchange rate.
3. It is essential to broaden long-term financing alternatives, reinforce credit-guarantee programs, enhance financial markets, and sustain a stable interest-rate corridor to facilitate private-sector investment, while ensuring coherence among monetary, fiscal, trade, and industrial policies to mitigate macroeconomic distortions and improve economic stability.
4. Enhancement of the quality and transparency of macroeconomic data, alongside the fortification of policy-making institutions, to facilitate informed decision-making and mitigate uncertainty.

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