Exchange Rate Volatility and Economic Growth in Nigeria: An Investigation of Monetary Policy Effects

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Abstract

Given the persistent fluctuations in the naira and their implications for investment, trade, inflation, and overall economic performance, it is imperative for monetary authorities to adopt policies that enhance exchange rate stability and support sustainable growth. It is against this backdrop that this study seeks to investigate the impact of exchange rate volatility and economic growth in Nigeria: an investigation of monetary policy effects, using secondary annual time series data from 1981 to 2024 from the Central Bank of Nigeria Statistical Bulletin and data from World Development Indicators (WDI). The dependent variable is real gross domestic product (RGDP), while real effective exchange rate (REER), broad money supply (M2), credit to private sector (CTS), interest rate (INT), inflation rate (INFL), foreign direct investment (FDI), and trade openness (TOP) were the independent and control variables, respectively. The test mechanisms adopted were the unit root test for

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co-integration and the Autoregressive Distributed Lag (ARDL) technique. Findings revealed that there is a positive and significant relationship existing between the real effective exchange rate, interest rate, credit to the private sector, and foreign direct investment in both the long and short run periods, suggesting that these variables contribute immensely to economic growth and monetary policy effectiveness in Nigeria when properly harnessed. However, broad money supply, inflation rate, and trade openness exhibited a shocking negative and insignificant relationship with economic growth in both periods, showing that during the period under review, the underlisted variables were not properly or adequately harnessed to bring about monetary policy effectiveness, thereby improving growth in Nigeria. Therefore, for policy, the study recommended that Government should strengthen the monetary policy transmission mechanism by improving credit flow to the productive sectors and enhancing financial market efficiency ,adopt a more credible and transparent inflation-targeting framework, support by stronger coordination with fiscal authorities to minimize deficit financing pressures, ensure that Exchange rate stability is essential to ensure that trade openness promotes competitiveness and supports domestic production and finally, structural reforms such as improving infrastructure, diversifying exports, and addressing supply-side constraints should complement monetary policy to ensure that changes in money supply, price levels, and trade conditions translate effectively into sustainable economic growth.

Keywords: real GDP, real effective exchange rate, broad money supply, foreign direct investment, interest rate, inflation rate, trade openness.

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1.0 Introduction

Monetary policy in Nigeria is anchored on a monetary targeting framework, such as exchange rate stability, full employment, sustainable economic growth, balance of payment equilibrium, and price stability, which represents the overall objective of monetary policy. The special reference to price stability in this study is derived from new developments in monetary theories and empirical evidence, which show that sustainable growth can only be achieved when there is stability in the price level (Nnanna, 2002). Therefore, the centrality of the exchange rate in the formulation of monetary policy derives from the fact that for most countries, the prevailing objective of monetary policy is price stability. Volatility in exchange rate is always seen to be counterproductive to the objective of price stability. There is indeed a general agreement that domestic price volatility undermines the value of money as a store of value and frustrates investments and growth. There is a widespread belief that volatility in the exchange rates in less developed countries is one of the main sources of economic instability around the world. The impact of the global economy on emerging countries like Nigeria is driven significantly by swings among the currencies of the major economic powers like the United States. In recent years these swings have been enormous, volatile, and frequently unrelated to underlying economic fundamentals. This has encouraged monetary authorities in developing countries that keep close ties with the economic powers to intervene on a totally ad hoc and episodic basis, without any clear sense of a sustainable equilibrium. Such exchange rate stability intervention typically comes too late to prevent severe currency misalignment and volatility. These imbalances, in turn, trigger major economic distortions, protectionist trade pressures, and inevitably sharp currency reversals (Philippe et al., 2006).

Exchange rate regime varies with the level of financial development. Throughout the developing nations, the choice of exchange rate regime stands as perhaps the most contentious aspect of macroeconomic policy. Empirical literature has shown that exchange rate volatility in turn is caused by both real and financial aggregate shocks. Yet, despite the perceived implications of the exchange rate regime for long-run growth and economic stability, the existing theoretical and empirical literature on Africa, mostly Nigeria in particular, considering the level of the country's

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economic integration through trade and foreign capital inflows, offers little guidance. The theoretical literature is mainly tailored to richer countries with highly developed institutions and markets (e.g., Garber et al., 1995; Obstfeld and Kenneth, 1996), and there is almost no discussion of long-run growth. The best-known theoretical explanation of long-term stability and consistency of bilateral exchange rates is the Purchasing Power Parity (PPP) hypothesis. Testing for long-run PPP is important for a number of reasons: Many monetary models á lá Dornbusch (1986) hinge on the validity of long-run PPP theory, while many other macroeconomic models often use PPP to link domestic and foreign development, especially in developing countries like Nigeria.

In Nigeria, maintaining a realistic exchange rate for the naira is very crucial, given the structure of the current economic situation and the need to minimise distortions in production and consumption, increase the inflow of non-oil export receipts, and attract foreign direct investment. Moreover, the persisting problems of import dependency, capital flight, and lack of motivation for backward linkages in the production process need to be addressed, amongst others. Exchange rate and monetary policy are therefore key tools in economic management and in the stabilisation and adjustment policies in developing countries like Nigeria. In most developing countries, low inflation and international competitiveness have become major policy targets. The real exchange rate is a measure of international competitiveness. Against this backdrop, this study tries to examine the interplay between monetary policy shocks and exchange rate volatility in an import-dependent economy like Nigeria. The rest of the paper is organised as follows: in addition to the introductory aspect, section two addresses relevant theoretical and empirical literature reviews. Meanwhile, section three presents methodology, empirical results, and policy recommendations.

2.0 Review of Relevant Literature

2.1 Conceptual Framework

2.1.1 Concept of Monetary Policy

Monetary policy is defined as "any policy measure designed by the Federal Government through the CBN to control cost availability and supply of credit" (CBN, 2009). Monetary policy deals with discretionary control of money supply by the

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monetary authorities (Central Bank with Central Government) in order to achieve stated or desired economic goals. Governments try to control the money supply because most governments believe that its rate of growth has an effect on the rate of inflation. Hence, monetary policy comprises those government actions designed to influence the behaviour of the monetary sector. Jhingan (2008) defined it as the use of money supply to regulate the level of economic activities in a country. Monetary policy is essentially a program of action undertaken by the monetary authorities, generally the central bank, to control and regulate the supply of money with the public and the flow of credit with a view to achieving predetermined macroeconomic goals (Dwivedi, 2005). Monetary policy consists of a government's formal efforts to manage the money in its economy in order to realise specific economic goals. If there is a shortage of money supply in an economy, the monetary authority will embark on expansionary monetary policy so as to stimulate the level of economic activities, and if there is excess money in circulation leading to increasing prices, the monetary authority will reduce the level of money supply using the various instruments of money control. Monetary policy is the deliberate use of monetary instruments (direct and indirect) at the disposal of monetary authorities such as central banks in order to achieve macroeconomic stability. Monetary policy is essentially the tool for executing the mandate of monetary and price stability. Concisely, the monetary policy objective of controlling the money supply in the economy of a nation is to stimulate and achieve desirable economic growth. Monetary policies are more effective only when economies are characterised by well-developed money and financial markets, like the developed economies of the world. This is where a deliberate change in a monetary variable influences the movement of many other variables in the monetary sector. Three basic kinds of monetary policy decisions can be made: a) the amount of money in circulation; b) the level of interest rate; c) The functions of credit markets and the banking system (Ogunjimi, 1997).

The combination of these measures is designed to regulate the value, supply, and cost of money in an economy, in line with the level of economic activity. Excess supply of money will result in an excess demand for goods and services, prices will rise, and the balance of payments will deteriorate. The challenges of monetary policy management rest wholly on monetary authorities, which have over the years been

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committed to its effective control. The instruments of monetary policies are divided into two: first, quantitative, general, or indirect monetary policy and second, qualitative, selective, or direct monetary policy. The indirect tools are related to the quantity or volume of the money. They are the general tools for credit control. They are designed to regulate or control the total volume of bank credit in the economy. I.e., they affect the level of aggregate demand through money supply, cost of credit, and availability of credit.

2.1.2 Concept of Exchange Rate

Exchange rate is the rate at which one country's currency is exchanged for the currency of another country (Dornbusch, 2004). It can also be defined as the price of one country's currency relative to other countries' currencies. While Mankiw (1997) defines it as the price at which exchanges between two countries take place. How to determine the exchange rate is an issue that has taken centre stage in monetary and international economics. Monetary policy authority in Nigeria is faced with the problem of having a stable and realistic exchange rate that is in consonance with other macroeconomic fundamentals. This is because exchange rate instability can have serious adverse consequences on prices, investments, and international trade decisions. A realistic exchange rate is one that reflects the strength of foreign exchange inflow and outflow and the stock of reserves, as well as ensuring equilibrium in the balance of payments that is consistent with the cost and price levels of trading partners. While exchange rate shocks imply the ability of a country's currency relative to another country's currency to fluctuate over time. 'Exchange rate shocks' is a term used to describe a phenomenon that occurs when the value of one currency spikes relative to another in an extremely short period of time. Exchange rate shocks could depend on two basic policies, that is, the fixed exchange rate policy and the flexible exchange rate policy. By fixed exchange rate policy (regime), we mean a situation when the exchange rate is set and the government is committed to buying and selling its currency at a fixed rate, while flexible exchange rate policy defines a situation when the exchange rate is set by market forces (demand and supply for a country's currency). Beyond directly influencing different economic channels, exchange rate shocks have policy implications that are not as easily understandable.

2.2.2 Theory of Exchange Rate

In general, two theories of exchange rate would be discussed to form the main theoretical frameworks upon which this study hinges; they include the purchasing power parity model and the more modern asset market theory of exchange rate. The purchasing power parity is a simple theory of equilibrium exchange rate determination and is used mainly for cross-country comparison of living standards and examining the productivity levels over time as well as determining the relative value of currencies (Vachris and Thomas, 1999, as cited by Omolara et al., 2012). This theory is based on the proposition that exchange rates would adjust to equalise the relative purchasing power of currencies. Thus, it is expected that in perfectly competitive markets, identical products would trade at equivalent prices when valued in the same currency. The PPP theory is based on the notion that the exchange rate is dependent on the actual buying power over a basket of goods and so changes in the nominal exchange rate should reflect changes in the prices of goods (Taylor and Taylor, 2002, as cited in Omalar et al., 2012). Thus, PPP theory is based on the *law of one price*. This law assumes that nominal exchange rates adjust to offset differences in prices between countries. In simple terms, identical goods should sell for the same price in different locations once prices are converted into a common currency, provided there are no trade barriers, such as tariffs or transport costs, and competition is perfect. The law holds reasonably well for widely traded commodities, such as gold and oil, and for financial assets. However, it performs poorly for most consumer goods because factors such as transport costs, taxes, and unequal access to information create lasting differences in prices. It is a cornerstone for understanding Purchasing Power Parity (PPP) and exchange rates, though often violated in reality, especially for non-tradable or differential products.

2.3 Empirical Literature

The inter-relationship between monetary policy shock and exchange rates has long been a focus of research in monetary and international economics. Numerous past studies that studied the relationship between monetary policy shocks and exchange rate volatility, especially in developed countries and less developed countries came up with different findings:

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Mireille (2007) argues that overvaluation of exchange rates has constituted a major setback in the recovery process of Nigeria and the Republic of Benin. In addition, the author suggested devaluation, accompanied by well-targeted measures alongside an upward adjustment in the domestic price of tradable goods, could restore exchange rate equilibrium and improve economic performance.

Cooper (2021) also reviewed twenty-four devaluation experiences involving different developing nations during the period 2010-15. The study showed that devaluation improved the trade balance of the devaluing country, but the economic activity often decreased in addition to inflation in the short run.

Olalekan et al. (2025) investigated exchange rate variability and volatility effects on economic growth using data from 1990–2023. The study Found a positive but low-impact relationship between exchange rate (volatility) and real GDP growth. Suggests a policy focus on import substitution and investor incentives to foster growth. Danladi (2025) Used ARCH/GARCH to assess exchange rate volatility and ARDL to examine its impact on growth (2010–2023). The study shows that volatility has a significant negative long-run impact on growth but a positive short-run effect. The study therefore recommends stronger monetary/fiscal policies and risk-mitigation tools (e.g., forward contracts).

Okoye, Nwokoye and Uzonwanne (2024). Explored how money supply influences volatility in Nigeria from 1981 to 2022. They found out that monetary policy action (money supply changes) significantly affects exchange rate volatility and that contractionary policy can reduce volatility. The study therefore highlights interaction between monetary policy and exchange rate behaviour.

Olabisi and Akeju (2024). Used ARDL and GARCH to link exchange rate volatility with inflation and economic growth in Nigeria from 1985 to 2022. They therefore conclude that both volatility and inflation adversely affect growth. Therefore, for policy, they pointed to a focus on stabilising exchange rates and inflation.

Moses et al. (2020) examined the USD/NGN volatility monthly data from 2003–2017 using GARCH & VECM and showed negative impacts of exchange rate volatility on GDP growth and short-term causal effects. The study therefore shows a nuanced short-run dynamic important for monetary policy planning.

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Dalla and Varelas (2013) investigated the influence of monetary policy on the optimal behaviour of exchange rates using VECM. They discussed how the overdraft rate and the minimum reserve requirements affect the equilibrium values of the lending rate and deposit rate as well as the corresponding quantities, especially when there is only one commercial bank in the economy and the Central Bank. Moreover, we examine the impact of these changes on the magnitude of the spread between the equilibrium rates and demonstrate that monetary policy via the overdraft rate does not affect the real exchange rate, while the effect of a change in the fraction of the minimum reserve requirements differs depending on the case.

Cagliarini and Mckibbin (2009) use the multi-sector and multi-country G-Cubed model to explore the potential role of three major shocks – to productivity, risk premia and US monetary policy – to explain the large movements in relative prices between 2002 and 2008. An interesting conclusion of the simulation exercise carried out by the study is that monetary policy tends to affect relative prices for up to four years because the effect of a temporary change in real interest rates varies across sectors. The effect depends on each sector's relative capital intensity as well as on the change in the demand for the output of each sector as consumption and investment adjust. Eventually the effect of monetary policy on relative prices dissipates.

In another work, Ahmed and Rafar (2009) utilised the cointegration test, Ordinary Least Square (OLS) and the Granger causality test to investigate the determinants of exchange stability in Nigeria from 1990 to 2007. The results from the estimated model indicated that a long-run relationship existed among the selected variables. The influence of money supply and cash reserve ratio was significant on the exchange rate in the country. Also, the study asserted that there was an existence of a unidirectional causality between exchange rate and other variables of interest.

Similarly, Masha (2011) applied the Johansen co-integration technique to estimate the link between monetary policy actions and exchange rate determination in Ghana with the annual data of 1982 to 2009. It was concluded from the study that prompt monetary action resulted in short-term and long-term stability of the exchange rate in the country. Therefore, the paper recommended that the government of the country should employ policy tools like interest rates, liquidity, money supply and cash reserve ratios to stabilise the exchange rate.

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While examining how monetary policy impacts exchange rate and growth in Zambia within the period of 1992 and 2006, Zulu and Paul (2008) used multiple regression models to establish the existence of a direct impact of money supply and liquidity ratio on exchange rate. Meanwhile, the reverse was the case for the minimum rediscount rate, exports and periodic policy changes on the exchange rate.

In the same vein, Hameed et al. (2012) analysed the impact of monetary policy on macroeconomic variables such as money supply, GDP, exchange rates, interest rates, and inflation with the application of ordinary least squares (OLS). The authors submitted that a tight monetary policy (in terms of increased interest rates) contributed a significant adverse effect to output. But an increase in money supply caused a noticeable direct impact on inflation, which consequently contributed to a negative influence on output. Exchange rate and output had an inverse relationship with each other.

However, Umar (2013) employed the Granger causality test and the Error Correction Model (ECM) to examine how monetary policy determines exchange rates in Nigeria, ranging from 1980 to 2011. The findings that emerged from the paper posited that money supply had a significant direct impact on exchange rate, whereas monetary policy rate and liquidity ratio had a reverse effect on exchange rate.

Consequently, Chukuigwe and Abili (2008) adopted the Ordinary Least Squares technique to investigate the impact of monetary and fiscal policies on non-oil exports in Nigeria between 1974 and 2003. It was discovered from the study that both interest rate and exchange rate exerted a negative impact on non-oil exports while estimating the connection between exchange rate regimes and international business cycles.

Oliver and Thepthida (2005) embraced a general equilibrium model to establish two sources of real exchange rate fluctuations as relative interest rate changes and movement in the relative price of imports across countries. It was further concluded that monetary growth had significant effects on exchange rates.

In addition, Zafar and Sabo (2013) utilised multiple regression models to analyse the nexus between monetary policy and exchange rate between 1980 and 2010. The researchers *discovered from the estimated model that the effects of money supply, monetary policy* rate, Treasury bill rate and cash reserve ratio were negative and

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significant on exchange rate. The paper submitted that the implementation of monetary policy decisions in a timely and effective manner would be the best solution to the issues of exchange rate management.

Meanwhile, Ajisafe and Folorunsho (2002) estimated the relative effectiveness of monetary and fiscal policy on macroeconomic variables in Nigeria between 1970 and 1998 with the aid of cointegration and an error correction model. The study corroborated that monetary policy exercised a greater impact on the Nigerian economic variables than fiscal policy. It was therefore concluded that the past advocacy by the government to embark on fiscal measures has resulted in greater distortion in the economy.

Furthermore, Amassoma et al. (2021) utilised the ordinary least squares approach to evaluate how monetary policy affects macroeconomic variables in Nigeria, ranging from 1986 to 2009. The results originating from the work concluded that monetary policy exerted a significant influence on both money supply and exchange rate, while the reverse was the case for price stability.

Aderemi et al. (2024) carried out a study on the impact of monetary policy on exchange rates in Nigeria: a bound test and ARDL approach. Data was collected from the Central Bank of Nigeria Statistical Bulletin from 1990 to 2016, and various diagnostic tests, such as unit root and bound tests, were carried out. Consequently, the ARDL model was utilised to address the objective of this study. It was discovered in this study that the credit reserve requirement and Treasury bill rate have a negative relationship with the exchange rate. However, the monetary policy rate and broad money supply have a positive relationship with the exchange rate in the country. The study recommended that the central bank should increase the rate at which it sells Treasury bills to the commercial banks. The multiplier effect of this policy will reduce the level of high-powered money and consequently stabilise the exchange rate.

Babatunde and Olufemi (2005) conducted work on monetary policy shocks and exchange rate volatility in Nigeria. The study applies the classical ordinary least square to examine the short-run monetary policy determinants of exchange rate volatility in Nigeria. Also, the error correction mechanism model was estimated after establishing the long-run interaction among the set of incorporated variables using the Engle-Granger approach. The results from the study show that both real and nominal

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exchange rates in Nigeria have been unstable during the period under review. In the short run, the variation in the monetary policy variable explains the movement/behaviour of the exchange rate through a self-correcting mechanism process with little or no intervention from the monetary authority (CBN). In addition, the results from the causality tests between the exchange rate volatility and monetary policy variables showed that there is a causal link between the past values of monetary policy variables and the exchange rate.

3.0 Methodology

This section describes the empirical strategy adopted to examine the effect of exchange rate volatility on monetary policy and economic growth in Nigeria. The study employs an ex post facto research design. This design is appropriate because the researcher has no direct control over the independent variables, and conclusions about the relationships among the variables are drawn without any direct interaction between the regressand and the regressors (Ndiyo, 2005).

The study relies on secondary data, specifically time-series data obtained from the Central Bank of Nigeria (CBN) Statistical Bulletin and the World Development Indicators (WDI). The analysis covers the period from 1981 to 2024. The variables employed include real gross domestic product (RGDP), real effective exchange rate (REER), broad money supply (M2), interest rate (INTR), inflation rate (INFL), credit to the private sector (CPS), investment rate (INV), foreign direct investment (FDI), and trade openness (TOP).

The econometric analysis is conducted using multiple regression techniques and is supported by several diagnostic tests. Stationarity properties of the variables are examined using the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. Furthermore, the Autoregressive Distributed Lag (ARDL) approach is employed to assess both the short-run and long-run relationships between exchange rate volatility, macroeconomic instability, and economic growth in Nigeria within the specified time.

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3.1 Model Specification:

The model for this study is as specified as follows:

Exchange rate volatility and the economic growth equation:

The functional form of the model for exchange rate volatility and the economic growth equation for this study is given as

RGDP=f(REER,M2,INTR,INFL,FDI,TOP,CTS.) ……………   (1)

The econometric form of the model is given as:

$RGDP_t = a_0 + a_1REER_t + a_2M2_t + a_3INTR_t + a_4CTS_t + a_5INFL_t + a_6FDI_t + a_7TOP_t + U_t$ …………………………………………………   (2)

Linearising it, we will have:

$logRGDP_t = a_0 + a_1logREER_t + a_2logM2_t + a_3logINTR_t + a_4logCTS_t + a_5logINFL_t + a_6logFDI_t + a_7logTOP_t + U_t$ ……….…………………….   (3)

$RGDP_t$ – Real Gross Domestic Product in time t

$REER_t$ – Real effective exchange rate in time t

$M2_t$ – broad money supply in time t

$INTR_t$ – interest rate in time t

CTS_t – credit to the private sector in time t

$INFLA_t$ – Inflation Rate in time t

FDI_t – foreign direct investment in time t

TOP_t – trade openness in time t

U_t – Error term

A priori Expectation shows that $a_1 > 0$, $a_2 < 0$, $a_3 < 0$, $a_4 > 0$, $a_5 < 0$, $a_6 < 0$, $a_7 < 0$, and $a_8 < 0$.

Table 1: Data Description and Sources

S/N	Variables	Description of Data	Expected Source
1	RGDP	Real GDP is the inflation adjusted total economic output of a nation's goods and services in a given period of time. Also known as "constant price GDP" inflation corrected GDP. Real GDP is derived by	CBN Statistical Bulletin (2024)

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		isolating and removing inflation from the equation by placing value at base-year prices, making GDP a more accurate reflection of a nation's economic output. RGDP serves as a dependent variable in the model and a proxy for economic productivity. A priori expectation: positive (+)	
2	REER	The real exchange rate is a measure of a country's currency value relative to a basket of other major trading partners' currencies, adjusted for differences in inflation. It used as an explanatory variable in the model. A priori expectation: negative (-)	WDI (2024)
3	M2	Broad money supply denoted as M2 is a comprehensive measure of the total amount of money available in an economy. It is used as a measure for money supply and serves as an explanatory variable for the model. A priori expectation: negative (-)	CBN Statistical Bulletin (2024)
4	FDI	Foreign direct investment on renewable energy. This represents the net investment made by individuals, firms and governments in one country into business located in another country in the renewable energy subsector. The growth rate of net foreign direct investment in renewable energy is used to represent foreign direct	WDI (2024)

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		investment in this study. It serves as explanatory variable for the model. A priori expectation: positive (+)	
5	INFL	Inflation rate is the persistent rise in the general price level. It serves as a control variable for the model. A priori expectation: negative (-)	CBN Statistical Bulletin (2024)
6	CTS	This the amount of credit to the private sector expressed as a percentage of a country's GDP. It is the total value of credit extended by banks and other financial institutions to the private sector. It serves as explanatory variable for the model. A priori expectation: positive (+)	World Bank Indicator (2024)
7	INTR	Interest rate is the percentage at which borrowed money is paid back to the lender. It is essentially the cost of borrowing money. It is often fixed by the Apex. It served as control variable and an explanatory variable for the model. A priori expectation: negative (-)	World Bank Indicator (2024)
8	TOP	Trade Openness is the rate of import plus export divided by the GDP. It serves as explanatory variable for the model. A priori expectation: positive (+)	World Bank Indicator (2024)

4.0 Data Presentation, Analysis and Discussion of Findings

4.1 Descriptive statistics and matrix of correlations

Table 2: Descriptive Statistics

	RGDP	REER	M2	INTR	CTS	FDI	INFL	TOP
Mean	5.537045	156.5453	24.50295	22.50386	7.901331	1.535909	19.39432	0.331818
Median	3.825000	105.6749	20.04500	23.04500	4.859494	1.130000	12.90000	0.335000
Maximum	85.05000	536.9107	87.76000	36.09000	27.04000	5.790000	72.80000	1.190000
Minimum	-13.00000	49.77631	-0.790000	10.00000	0.095438	0.260000	5.400000	0.070000
Std. Dev.	13.09838	121.9060	19.28749	5.783380	8.354243	1.192762	16.65383	0.187211
Skewness	5.159266	1.709638	1.411287	-0.318431	0.726489	1.756956	1.728820	2.202593
Kurtosis	32.44055	4.957605	5.031485	3.082975	2.138510	6.264393	4.881464	11.29813
Jarque-Bera	1784.233	28.46005	22.17208	0.756210	5.231067	42.17370	28.40783	161.8186
Probability	0.000000	0.000001	0.000015	0.685159	0.073129	0.000000	0.000001	0.000000
Sum	243.6300	6887.992	1078.130	990.1700	347.6586	67.58000	853.3500	14.60000
Sum Sq. Dev.	7377.402	639026.5	15996.31	1438.242	3001.115	61.17526	11926.05	1.507055
Observations	44	44	44	44	44	44	44	44

The descriptive statistics of the variables are presented in Table 2 above. This table highlights key trends in Nigeria's economic growth indicators during the review period. The data reveal a high level of real effective exchange rate (REER), broad money supply (M2), interest rate (INTR), and inflation rate (INFL). For the real effective exchange rate (REER), the mean, median, and maximum values are 156.5453, 105.6749, and 536.9107, respectively. For broad money supply (M2), the mean, median and maximum values are 24.50295, 20.04500 and 87.76000. Interest rate (INTR) values are 22.50386 (mean), 23.04500 (median) and 36.09000 (maximum). Inflation rate (INFL) values are 19.39432 (mean), 12.90000 (median), and a maximum value of 72.80000, respectively.

In contrast, Real Gross Domestic Product (RGDP), credit to the private sector (CTS), foreign direct investment (FDI) and trade openness (TOP) made relatively low contributions to economic growth, with statistics of 5.537045 (mean), 3.825000 (median) and 85.05000 (maximum) for RGDP; 7.901331 (mean), 4.859494 (median) and 27.04000 (maximum) for credit to the private sector; 1.535909 (mean), 1.130000

(median) and 5.790000 (maximum) for foreign direct investment; and 0.331818 (mean), 0.335000 (median) and 1.190000 (maximum) for trade openness, respectively. The response of the real effective exchange rate (REER), broad money supply (M2) and inflation rate (EXR) to economic growth has been volatile, showing fluctuations during the period. Real effective exchange rate (REER) statistics include a mean of 156.5453, a median of 105.6749 and a maximum of 536.9107 with a standard deviation of 121.9060. Broad money supply (M2) statistics reveal a mean of 24.50295, a median of 20.04500, a maximum of 87.76000, and a standard deviation of 19.28749. Inflation Rate (INFL) statistics reveal a mean of 19.39432, a median of 12.90000, a maximum of 72.8000, and a standard deviation of 16.65383, respectively.

Skewness and Kurtosis Analysis: The skewness results indicate that only one variable is positively skewed, suggesting right-tailed distributions. The kurtosis results show that real gross domestic product (RGDP), real effective exchange rate (REER), broad money supply (M2), interest rate (INTR), foreign direct investment (FDI), inflation rate (INFL) and trade openness (TOP) are leptokurtic (kurtosis > 3), indicating peaked distributions. Conversely, only credit to the private sector (CTS) is platykurtic (kurtosis < 3), reflecting flatter distributions.

Normality and Variability: The Jarque-Bera test confirms that all variables are normally distributed over the analysis period. The standard deviation values highlight the extent of variation in the data, with most variables showing significant deviations from their true values. Except for foreign direct investment (FDI) and trade openness (TOP), which have relatively small deviations of 1.192762 and 0.187211.

Table 3: correlation Matrix

	RGDP	REER	M2	INTR	CTS	FDI	INFL	TOP
RGDP	1							
REER	0.39	1						
M2	0.21	0.71	1					
INTR	-0.21	0.45	0.19	1				
CTS	0.02	-0.17	0.35	-0.13	1			
FDI	0.57	0.12	0.29	-0.54	0.59	1		
INFL	0.85	0.62	0.58	-0.09	0.08	0.61	1	
TOP	0.53	0.87	0.49	0.42	-0.32	0.11	0.74	1

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The correlation matrix of the variables is as shown in Table 3 above. The correlation matrix is a statistical tool that measures the relationship between multiple variables. It provides a table of correlation coefficients which describe the strength and direction of the linear relationships between each pair of variables. From the table above, RGDP has a positive correlation coefficient with REER, M2, CTS, FDI, INFL and TOP. This therefore indicates that the variables tend to move in the same direction. Meanwhile, INTR has a weak negative correlation (-0.21), indicating that as RGDP increases, INTR tends to decrease. The table indicates a positive correlation coefficient between REER and M2, INTR, INFL, FDI, and TOP; M2 and INTR, CTS, FDI, INFL, and TOP; INTR and TOP; CTS and FDI, INFL; FDI and INFL, TOP; and INFL and TOP. Conversely, there is a weak negative correlation between REER and CTS; INTR and CTS, FDI, and INFL; and CTS and TOP, respectively.

4.1.2   Unit Root Test

The Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests were conducted to examine the stationarity properties of the variables. As indicated in Table 4, RGDP, M2, INTR, and FDI were identified as stationary at level according to both the ADF and PP tests. In contrast, REER, CTS, INFL, and TOP became stationary only after first differencing in both tests. This indicates that the variables are integrated of mixed orders, specifically I(0) and I(1).

The presence of variables integrated at different orders suggests the possibility of unit root problems within the estimated equations. Consequently, it is necessary to conduct co-integration tests to determine whether a long-run equilibrium relationship exists among the variables. Given the mixed order of integration, the study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach to investigate co-integration. This method is particularly appropriate for variables that are integrated of order zero and order one.

Table 4: ADF and Philip-Perron Unit Root Test Results

Variables	ADF Level	1st Difference	Order of integration	PP Level	1st Difference	Order of integration
RGDP	-6.007336	-	I(0)	-	-	I(0)
REER	-2.598357	-3.461822	I(1)	-	-	I(1)
M2	-3.252443	-	I(0)	-	-	I(0)

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INTR	-3.469976	-	I(0)	-	-	I(0)
FDI	-4.070224	-	I(0)	-	-	I(0)
CTS	-1.968039	-6.137874	I(1)	-	-	I(1)
TOP	0.338619	-4.111230	I(0)	-	-	I(0)
INFL	-2.535807	-6.313508	I(1)	-	-	I(1)

Source: Researcher's computation (2025), using E-Views 9.

Note: Mackinnon critical values for ADF at 1, 5 and 10% levels are -3.60, -2.93 and -2.60 respectively, and for PP are 3.605, 2.936 and 2.606, respectively. ** means significant at 5% level.

4.1.3   Lag Length Selection

Table 5: Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-1046.710	NA	3.05e+12	51.44927	51.78362	51.57102
1	-923.0887	192.9698*	1.76e+11*	48.54091	51.55011*	49.63670*
2	-859.7478	74.15524	2.63e+11	48.57306	54.25711	50.64288
3	-765.7826	73.33863	1.94e+11	47.11135*	55.47024	50.15519

Source: Researcher's computation (2025), using E-Views 9.

The efficiency and validity of an error correction model depend on the lag structure. The study used VAR lag order selection criteria to determine the lag lengths. The study employed the Akaike Information Criterion (AIC) and Schwarz Criterion (SC), and the result shows four optimal lag lengths in the inclusive growth index and fiscal deficit models, as shown in Table 5 above. In order to reduce the possibilities of underestimation whilst maximising the likelihood of recovering the true lag (Venus, 2004), the study used three and four as the maximum lag lengths, respectively.

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4.1.4   Co-integration Test Results

From the bound testing result reported in Table 6 below, a long-run relationship exists amongst the variables in all the estimated equations, given that the values of the F-statistic are greater than the critical values at the five per cent level in both the upper and the lower bounds. Therefore, the null hypothesis of absence of co-integration is rejected, while the study proceeds to estimate the long-run coefficient of each of the equations.

Table 6: Co-Integration Test Results

5% critical value					
Equations	K	F-Stat	I (0)	I (1)	Outcome
RGDP (REER, M2, INTR, CTS, FDI, INFL, TOP,)	7	11.23	2.32	3.5	Co-integration

Note: K =number of parameters
Source: Researcher's computation (2025), using E-Views 9

4.1.5   Findings, Presentation and Analysis of Econometric Results of the Long run coefficients of Exchange rate volatility and Economic growth Equation Results

Table 7:   Dependent variable: RGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REER	0.075498	0.023173	3.258053	0.0039
M2	-0.128651	0.099481	-1.293223	0.2107
INTR	0.285949	0.362742	0.788300	0.4398
CTS	0.064228	0.223771	0.287025	0.7770
FDI	8.851768	2.805920	3.154675	0.0050
INFL	-0.333028	0.166003	-2.006163	0.0586
TOP	-0.632990	14.119156	-0.044832	0.9647
C	-17.162917	12.334052	-1.391507	0.1794

Source: Researcher's computation (2025), using E-Views 9.

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Long-run coefficients of exchange rate volatility and economic growth equation

The long-run relationship between economic growth and exchange rate volatility variables is presented in Table 7 above. Based on the ARDL long-run estimates, the findings reveal the following insights:

The coefficient for REER is positive and statistically significant, indicating that a unit increase in REER results in a 7.54% increase in RGDP. This finding deviates from a priori expectation in the long run. Therefore, the positive and significant long-run relationship between REER and growth in Nigeria suggests that the demand-side benefits of a strong currency (cheaper capital imports, lower inflation) have historically been more powerful for long-run growth than the supply-side benefits of a weak currency (export competitiveness).

Conversely, the coefficient for M2 is negative and statistically insignificant, indicating that a unit rise in M2 results in a -12.86% decrease in RGDP. This result also deviates from a priori expectation. Therefore, a negative and insignificant long-run relationship between broad money supply and economic growth in Nigeria indicates that expanding broad money supply does not meaningfully influence Nigeria's long-term growth. This reflects structural constraints, weak financial intermediation, inflationary pressures, and the limited effectiveness of monetary policy relative to fiscal and real sector factors.

Also, INTR exhibits a positive and statistically insignificant relationship with RGDP. A one-unit increase in INTR is associated with a 28.59% increase in RGDP. This result deviates from a priori expectations, implying that interest rate changes do not substantially influence long-term economic performance, although there is a weak indication that higher interest rates may accompany conditions of better macroeconomic stability or improved financial sector functioning. Overall, monetary policy through interest rates has limited long-run effectiveness in promoting growth.

The coefficient for CTS is positive and statistically insignificant, indicating that a one-unit increase in CTS will lead to a 6.42% increase in RGDP. This finding is in line with theoretical expectation, implying that although private-sector credit has the potential to support long-term growth, the banking and economic environment is too weak, inefficient, or distorted for this credit to translate into meaningful long-run

economic development. As a result, monetary policy through the credit channel has limited long-run effectiveness in Nigeria.

The coefficient of FDI is positive and statistically significant, indicating that a one-unit rise in FDI will lead to 885.17% increases in RGDP. This result is in line with a priori expectation, suggesting that foreign direct investment makes a substantial and reliable contribution to long-term economic growth and development by expanding productive capacity, facilitating technology transfer, promoting capital formation, and complementing domestic investment. This also suggests that a stable and credible monetary policy environment enhances FDI inflows, thereby reinforcing FDI's role in driving long-run growth.

Furthermore, the coefficient for INFL is negative and statistically significant, indicating that a one-unit increase in INFL will result in a -33.30% increase in RGDP. This result is in line with a priori expectation, implying that persistent inflation, often driven by ineffective or inconsistent monetary policy, reduces investment, productivity, and macroeconomic stability, thereby slowing long-term economic growth.

Finally, the coefficient for TOP is negative and statistically insignificant, showing that a unit rise in TOP will lead to a 63.29% decrease in RGDP. This result deviates from a priori expectation, indicating that trade openness does not exert a stable or meaningful influence on Nigeria's long-run growth performance. While the negative sign suggests that greater openness may coincide with structural weaknesses such as import dependence, weak competitiveness, and limited value-added exports, the insignificance indicates that the effect is not robust. This means that in the long run, trade openness neither promotes nor significantly hinders growth within the context of Nigeria's monetary policy environment, reflecting deeper structural and institutional limitations.

In summary, the long-run analysis highlights the complex interplay between exchange rate volatility variables and economic growth in the monetary policy effect. While certain factors such as real effective exchange rate (REER), interest rate (INTR), credit to private sector (CTS), and foreign direct investment (FDI) positively influenced economic growth and monetary policy in Nigeria, others, like broad money supply (M2), inflation rate (INFL), and trade openness (TOP), posed significant

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challenges. These findings underscore the need for targeted policy interventions to focus on improving monetary policy credibility, strengthening financial intermediation, stabilising inflation, deepening structural reforms, and repositioning trade policy to enhance productivity. Only through these coordinated reforms can monetary policy variables exert meaningful long-run impacts on economic growth in Nigeria.

4.1.6 Findings, Presentation and Analysis of Econometric Results of the Short run coefficients of Exchange rate volatility and Economic growth Equation Results

Table 8: Dependent variable: RGDP

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(REER)	-0.028034	0.036780	-0.762224	0.4548
D(REER(-1))	-0.008828	0.059206	-0.149103	0.8830
D(REER(-2))	-0.161196	0.047927	-3.363375	0.0031
D(M2)	0.043482	0.119442	0.364044	0.7196
D(INTR)	0.458285	0.572504	0.800493	0.4328
D(CTS)	0.102937	0.359278	0.286509	0.7774
D(FDI)	1.918516	2.536414	0.756389	0.4582
D(FDI(-1))	-5.863181	2.285952	-2.564874	0.0185
D(FDI(-2))	-4.119106	1.978160	-2.082291	0.0504
D(INFL)	-0.354893	0.209312	-1.695516	0.1055
D(INFL(-1))	0.354462	0.206836	1.713729	0.1020
D(TOP)	35.061470	19.476296	1.800212	0.0869
D(TOP(-1))	-26.582092	30.575539	-0.869391	0.3949
D(TOP(-2))	61.626297	25.619799	2.405417	0.0260
CointEq(-1)	-1.602682	0.172181	-9.308111	0.0000

R-squared	0.853466	Mean dependent var	0.390000
Adjusted R-squared	0.706932	S.D. dependent var	17.97261
S.E. of regression	9.729611	Akaike info criterion	7.694775
Sum squared resid	1893.307	Schwarz criterion	8.572459
Log likelihood	-136.7429	Hannan-Quinn criter.	8.014379
F-statistic	5.824348	Durbin-Watson stat	2.019553
Prob(F-statistic)	0.000117		

The short-run dynamics of the relationship between exchange rate volatility and economic growth equation results, as presented in Table 8, reveal several significant findings.

In the current first and second periods, REER exhibits a negative and insignificant relationship with RGDP. Specifically, a 1% increase in REER will lead to -2.80%, -0.88% and -16.11% decreases in RGDP. This result is not in line with a priori expectations, suggesting that exchange rate appreciation has a mild, negative effect on growth, but the effect is too weak or unstable to be statistically meaningful. Nigeria's short-run growth is driven more by factors other than the exchange rate, such as oil prices, inflation, money supply and structural rigidities. Here, the exchange rate channel of monetary policy is weak in the short run; therefore, import dependence and structural constraints dilute the exchange rate impact.

Conversely, in the current period of the short run, M2 exhibits a positive and insignificant relationship with RGDP. Therefore, a unit rise in M2 will lead to 4.34% increases in RGDP. This result deviates from a priori expectation, suggesting that money supply growth has a weak and unreliable short-run impact on GDP. Liquidity created through monetary policy is not effectively channelled into productive sectors; structural and financial constraints limit monetary policy's short-term effectiveness. Inflation, exchange rate volatility, and financial inefficiencies may offset the expected growth impact. The positive sign suggests a potential supportive effect, but it is too weak to matter statistically.

INTR shows a positive and insignificant relationship with RGDP in the short run. Specifically, a unit rise in INTR will lead to 45.82% increases in RGDP. This result deviates from theoretical expectation, implying that interest rate changes do not significantly influence GDP growth in the short run. The banking and credit transmission channels of monetary policy are weak. Structural issues and inflation often dominate the short-run growth dynamics. Higher interest rates may correlate with growth through confidence or capital inflows, but the effect is too small and unstable to be significant. Monetary policy through interest rate adjustments is not an effective short-run tool for stimulating or constraining economic growth in Nigeria. The coefficient of CTS is positive and statistically insignificant in the short run. Therefore, a unit rise in CTS will lead to 10.29% increases in RGDP. This result is in

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line with a priori expectation, showing that credit expansion does not significantly stimulate short-run GDP growth. Bank credit does not efficiently flow to productive sectors of the economy. Structural and institutional constraints limit the effectiveness of credit as a monetary policy tool. Much credit is used for non-productive or consumption activities. The positive sign suggests credit can support growth, but its effect is weak and delayed.

The coefficient of FDI is positive and insignificant in the current period and negative but significant in both the first and second period lags of the short run. Therefore, a unit rise in FDI will lead to 191.85% increases in RGDP in the current period and -586.31% and -411.91% decreases in RGDP in the first and second period lags. The results of the current period are in line with a priori expectation, while the results of the first and second period lags deviate from a priori expectation, suggesting that in the first and second period lags, FDI inflows reduce economic growth in the short run. FDI is concentrated in extractive sectors with weak domestic linkages. High profit repatriation and import dependence offset growth benefits. Nigeria's weak business environment limits FDI's productive impact. Monetary and macroeconomic instability distort FDI's role in supporting real activity. FDI crowds out domestic investment or generates minimal employment and value-added.

INFL exhibited a negative but insignificant relationship with RGDP in the short run but became positive after a period lag, indicating that a one-unit increase in INFL will lead to a 35.48% decrease in RGDP in the current period and a 35.44% increase in RGDP in the first period. The result of the current period is in line with theoretical expectation, while the result of the first period lags and deviates from a priori expectation, showing that inflation does not significantly influence short-run GDP growth. Mild inflation may accompany periods of economic activity, but the effect is weak. Nigeria's inflation is largely structural and cost-push, not growth-inducing. The monetary policy channel through inflation is weak in the short run. Firms and consumers have adapted to inflation, reducing its real impact on growth. Inflation may affect nominal values more than real economic activity.

Finally, the coefficient of TOP exhibits a positive and significant relationship with RGDP in current and second-period lags of the short run but becomes negative and insignificant in the first period. Therefore a unit rise in TOP will lead to 350.61%

and 616.26% increases in RGDP and -265.82% decreases after a period lag. This result deviates from a priori expectation, while the current period result aligns with theoretical expectation, suggesting trade openness does not significantly influence short-run GDP growth. Although openness tends to support growth, the effect is weak and not statistically reliable. Nigeria's trade structure, oil dependence and high import intensity limit the ability of trade to spur growth. Exchange rate instability, structural bottlenecks, and weak manufacturing reduce the benefits of openness. Trade channels are not an effective short-run transmission mechanism of monetary policy.

The ECM coefficient (-1.602682) is correctly signed and statistically significant, indicating that approximately 160% of short-run disequilibria adjust to the long-run equilibrium within a year. The t-statistic (-9.308111) confirms the significance of the ECM at the 5% level.

The R-squared value (0.853466) and adjusted R-squared (0.706932) demonstrate that approximately 85% of the variation in RGDP is explained by the included variables (both current and lagged), with 15% attributable to factors outside the model. The F-statistic (5.82) confirms the joint significance of the model's variables, ensuring a good overall fit. Additionally, the Durbin-Watson statistic (2.01) indicates no autocorrelation, affirming the reliability of the results for forecasting and policy formulation.

The stability test using the cumulative sum (CUSUM) test in figure 4.1 below further shows that the variables included in the GDP per capita equation were stable within the period of the study. This is evidenced by the swing of the trends within the CUSUM bound at the ± five per cent significance level. The study, therefore, infers that the equation is stable and consistent enough to be adopted for economic policies and forecasts.

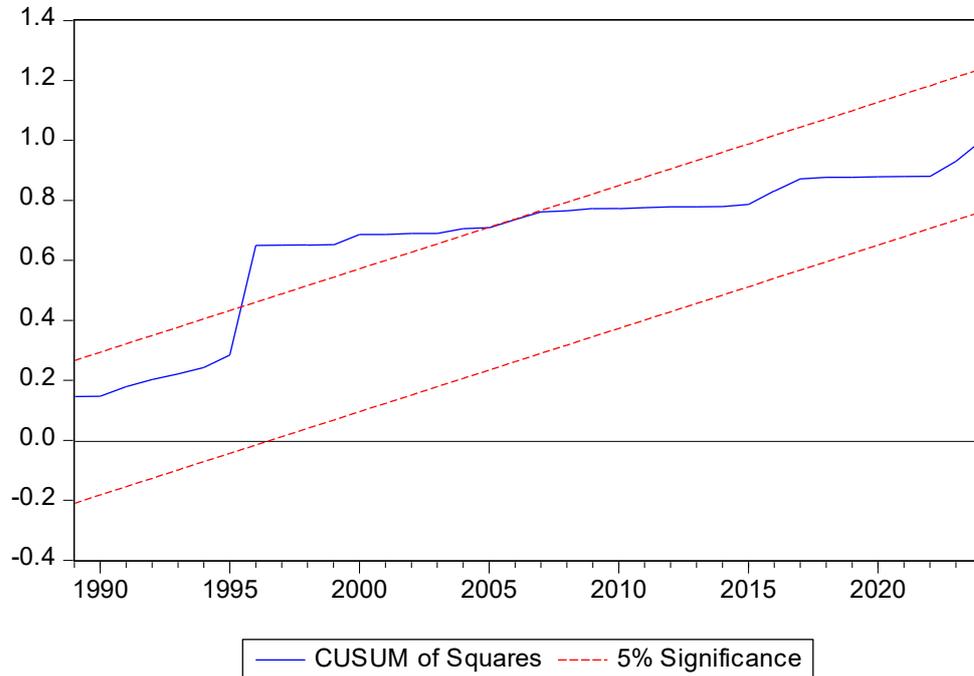*Edet Ekpenyong Benson, Ph.D; Edet Ebiefie Victor, Ph.D & Benson Ekpenyong Unyime*

Figure 4.1: exchange rate volatility and economic growth equation CUSUM.
Source: Researcher's Computation (2025).

Table 9: **Heteroscedasticity Test**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	4.307582	Prob. F (20, 20)	0.0010
Obs*R-squared	33.27520	Prob. Chi-Square (20)	0.0315
Scaled explained SS	13.67768	Prob. Chi-Square (20)	0.8465

R-squared	0.811590	Mean dependent var	44.32031
Adjusted R-squared	0.623181	S.D. dependent var	83.40258
S.E. of regression	51.19719	Akaike info criterion	11.01580
Sum squared resid	52423.04	Schwarz criterion	11.89348
Log likelihood	-204.8238	Hannan-Quinn criter.	11.33540
F-statistic	4.307582	Durbin-Watson stat	2.356855
Prob(F-statistic)	0.000973		

From the test results presented in table 9, both the probability of the F-statistic (4.307582) and the R-squared (0.811590) are greater than 0.05, indicating the absence of heteroscedasticity. Therefore, the errors are homoscedastic. Therefore, the long-run results succeed in all tests and are thus useful for analyses and forecasting.

The analysis obtained from table 9 shows that all the results from the test statistics of the model are acceptable. As a matter of fact, the adjusted R-squared is high (about 62.31%). This means that the independent variables explain the dependent variable for about 62.31%. The overall significance of the model is strong, as indicated by the probability of the F-statistic at the 1% level. The decision rule involves comparing the probability value of the F-statistic with the chosen level of significance (5%). As shown in Table 9, the p-value of 0.0010 is less than 0.05; therefore, the null hypothesis is rejected and the alternative hypothesis is accepted. This result implies that the model parameters are jointly significant, even at the 1% level. Furthermore, most of the estimated coefficients are individually significant at the 1% level of significance.

4.2 Discussion of Findings:

The short-run and long-run ARDL dynamics show an intriguing insight, as the regression result offers a positive and significant relationship between the four key variables of exchange rate volatility: real effective exchange rate (REER), interest rate (INTR), credit to private sector (CTS) and foreign direct investment (FDI), which interacted with the dependent variable RGDP. The results suggest that increases in the underlisted variables in essence will lead to corresponding increases in economic growth in Nigeria, which are major tools that enhance monetary policy development. However, broad money supply (M2), inflation rate (INFL) and trade openness (TOP) showed negative and insignificant relationships with economic growth in both the long- and short-run periods under review, reflecting that when these variables increase, economic growth tends to decrease. The negative relationship of broad money supply shows that during the period under review broad money supply in Nigeria did not translate into improved economic growth; instead, they are associated with declining welfare outcomes. This reflects the challenges of decline in broad money supply in monetary policy to foster economic growth in Nigeria; therefore, broad money supply

is not translating into economic productivity or sustainable economic growth. This indicates that monetary expansion does not effectively stimulate economic growth. When it does have an effect, it might even be slightly harmful, likely due to inflation, misallocation of credit, and structural bottlenecks; therefore, growth in Nigeria depends more on real sector fundamentals than on the quantity of money circulating, and hence the monetary policy mechanism is weak in both the short and long run periods.

Moreover, the negative and insignificant relationship between inflation rate and economic growth shows that INFL, though present, has not effectively contributed to sustainable long-term economic growth in Nigeria. This outcome may result from the fact that inflation exerts a mild but unstable adverse effect on output, yet this effect is too weak to be statistically meaningful. This suggests that inflation is not a key driver of Nigeria's economic growth, largely because inflation in Nigeria is driven by structural and supply-side factors, while growth depends on real sector fundamentals such as oil revenue, investment, and productivity. The insignificance in both the short and long run periods under review also indicates a weak monetary policy transmission mechanism, meaning monetary policy does not effectively influence real economic activity through inflation. Thus, policies aimed solely at controlling inflation are insufficient to promote growth without parallel structural and fiscal reforms.

Finally, the negative and insignificant relationship between trade openness and economic growth suggests that in both the short and long periods under review in Nigeria, increases in trade openness are not translating into immediate economic growth, implying that increased openness to international trade is weakly associated with lower economic performance, but the effect is not statistically meaningful. This suggests that Nigeria has not been able to convert trade integration into productive growth due to heavy reliance on crude oil exports, high import dependence, weak industrial capacity, and vulnerability to external shocks. The insignificant result in both the short and long run further implies that trade openness has limited influence on growth within Nigeria's monetary policy framework, reflecting a weak transmission mechanism between trade conditions and domestic economic activity. Therefore, trade openness alone cannot drive growth without structural reforms, export diversification, and improved competitiveness.

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However, the real effective exchange rate and broad money supply exhibited a dual behaviour in both the short and long term, suggesting that the impact of monetary and exchange rate variables on growth is unstable and context-dependent. This reflects a weak monetary policy transmission mechanism, structural dualism between the oil and non-oil sectors, and high vulnerability to external shocks and policy changes. In some periods, exchange rate movements or money supply expansions stimulate growth, while in others they generate inflationary pressures, reduce competitiveness, or weaken real sector performance. Therefore, the estimated results indicate that the effects in the short run differ from those in the long run, reflecting fluctuations arising from macroeconomic instability and policy inconsistencies. This divergence underscores the need for enhanced macroeconomic stability, consistent policy frameworks, and structural reforms to ensure that monetary and exchange rate policies effectively support sustainable economic growth. Although some variables exhibit opposite signs in the short run compared to the long run, these inconsistencies are corrected in the error correction mechanism (ECM), which confirms convergence toward long-run equilibrium.

5.1   Conclusion

This study examines the impact of exchange rate volatility on economic growth in Nigeria within the context of monetary policy, using annual data spanning the period 1981–2024 and adopting the Autoregressive Distributed Lag (ARDL) model. The findings indicate that variations in the real effective exchange rate, interest rate, credit to the private sector, and foreign direct investment significantly influence economic growth under Nigeria's monetary policy framework during the period under review. Furthermore, the results reveal a negative relationship between broad money supply, inflation rate, and trade openness, suggesting that these variables constrain economic growth in Nigeria. This implies that persistent declines in broad money supply, rising inflation, and unfavourable trade openness conditions weaken the effectiveness of monetary policy and, consequently, undermine sustainable economic growth in the country.

5.2   Recommendations

Therefore, we recommend that:

i.   Government and policymakers should strengthen the monetary policy transmission mechanism by improving credit flow to the productive sectors and enhancing financial market efficiency.

ii.   The Central Bank should adopt a more credible and transparent inflation-targeting framework, supported by stronger coordination with fiscal authorities to minimise deficit financing pressures.

iii.   Government and policymakers should ensure that exchange rate stability is essential to ensure that trade openness promotes competitiveness and supports domestic production.

iv.   Additionally, structural reforms such as improving infrastructure, diversifying exports, and addressing supply-side constraints should complement monetary policy to ensure that changes in money supply, price levels, and trade conditions translate effectively into sustainable economic growth.

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