
EXCHANGE RATE REGIMES, SPOT MARKET DYNAMICS, AND ECONOMIC GROWTH IN NIGERIA

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Abstract

This study investigated the effect of exchange rate regimes and spot market dynamics on economic growth in Nigeria over the period 1986–2025. Specifically, the study examined the long-run and short-run relationships between exchange rate regimes, spot market dynamics, and economic growth, determined the direction of causality among the variables, and evaluated the stability of the estimated model. The study adopted an ex post facto research design using annual time series data obtained from the Central Bank of Nigeria (CBN), National Bureau of Statistics (NBS), World Development Indicators (WDI), and International Monetary Fund (IMF). The analysis employed the Augmented Dickey-Fuller (ADF) unit root test, Johansen cointegration test, Vector Error Correction Model (VECM), Granger causality test, VEC residual diagnostic tests, and CUSUM stability test. The theoretical framework was anchored on the Mundell–Fleming Model, Purchasing Power Parity (PPP) Theory, and Optimum Currency Area (OCA) Theory. The findings revealed the existence of a long-run equilibrium relationship among the variables, with the Johansen Maximum Eigenvalue test indicating one cointegrating equation. The normalized long-run estimates showed that the nominal exchange rate exerted a significant negative effect on economic growth, while the floating exchange rate regime and spot exchange rate had significant positive effects. The real exchange rate exerted a positive but statistically insignificant effect on economic growth. The Granger causality test further revealed unidirectional causal relationships among the variables, while the diagnostic tests confirmed the absence of serial correlation (LM test, $p = 0.8663$) and heteroskedasticity ($\chi^2 = 114.1363$, $p = 0.1580$). The CUSUM test indicated that the estimated VECM was structurally stable. The study concluded that exchange rate regimes and efficient spot market operations significantly influence Nigeria's economic growth. Therefore, the study recommended maintaining exchange rate stability, strengthening the flexible exchange rate regime, deepening the spot foreign exchange market, and coordinating macroeconomic policies to achieve sustainable economic growth.

Keywords: Economic Growth; Exchange Rate Regimes; Nigeria; Spot Market Dynamics.

1.1 Introduction

Exchange rate regimes and foreign exchange market operations occupy a central position in contemporary macroeconomic management because they influence the allocation of resources, international competitiveness, investment decisions, and long-term economic performance. An exchange rate represents the price of one country's currency relative to another and serves as an important mechanism through which domestic economies interact with global markets. The exchange rate regime adopted by a country—whether fixed, floating, managed float, or a hybrid arrangement—determines the degree of official intervention in the foreign exchange market and shapes the responsiveness of the domestic currency to changes in market conditions. Alongside the exchange rate regime, spot market dynamics, which involve the immediate buying and selling of foreign currencies at prevailing market rates, significantly affect liquidity, price discovery, and exchange rate stability. Together, these factors influence inflation, trade competitiveness, capital movements, and economic growth, making them important considerations in both developed and developing economies (International Monetary Fund [IMF], 2024; Krugman et al., 2022).

The increasing integration of the global economy has strengthened the relationship between exchange rate behaviour and macroeconomic performance. Expanding international trade, cross-border investment, digital financial transactions, and global value chains have heightened the sensitivity of national economies to exchange rate movements. According to the World Trade Organization (2024), merchandise trade remains a major driver of global economic activity despite persistent geopolitical tensions and supply chain disruptions. Exchange rate stability contributes to predictable trade costs and encourages investment, whereas persistent volatility increases uncertainty, raises transaction costs, and discourages long-term business planning. Likewise, the IMF (2024) observes that exchange rate flexibility has become an essential adjustment mechanism for many economies confronting inflationary pressures, external shocks, and changing international capital flows. Consequently, policymakers increasingly view exchange rate management as an important instrument for sustaining macroeconomic stability while promoting economic growth.

Recent developments in international financial markets have further highlighted the significance of spot foreign exchange markets in shaping economic outcomes. The Bank for International Settlements reported that average daily turnover in global foreign exchange markets reached approximately US\$7.5 trillion, with spot transactions accounting for a substantial share of market activity (Bank for International Settlements, 2022). The efficiency of spot markets facilitates rapid adjustment to changing economic fundamentals by providing continuous price information that reflects the interaction between demand and supply for foreign currencies. However, heightened speculation, shifts in investor confidence, monetary policy divergence, and geopolitical uncertainty can generate substantial exchange rate volatility capable of affecting domestic production, international trade, and financial stability. Empirical studies similarly suggest that prolonged exchange rate uncertainty discourages foreign direct investment and reduces productivity-enhancing capital inflows, particularly in emerging and developing economies (OECD, 2023; World Bank, 2024).

The choice of exchange rate regime has therefore become an important policy issue in both advanced and developing economies. Countries operating fixed exchange rate systems often prioritize exchange rate stability to facilitate trade and maintain investor confidence, while economies adopting floating arrangements seek greater monetary policy independence and automatic adjustment to external shocks. Nevertheless, neither system is without limitations,

as inappropriate exchange rate management may contribute to inflationary pressures, external imbalances, reserve depletion, or reduced competitiveness. Modern macroeconomic literature emphasizes that the effectiveness of any exchange rate regime depends largely on institutional quality, policy credibility, financial market development, and the broader macroeconomic environment (Obstfeld & Rogoff, 2021; IMF, 2024). Accordingly, understanding the interaction between exchange rate regimes and spot market dynamics remains essential for evaluating economic performance across different countries.

Within Africa, exchange rate management presents unique challenges because many economies depend heavily on commodity exports, external financing, and imported manufactured goods. Fluctuations in international commodity prices frequently transmit directly to exchange rate movements, affecting government revenue, fiscal balances, and external reserves. According to the African Development Bank (2024), economic growth across Africa has remained resilient despite persistent inflationary pressures, climate-related shocks, and volatile global financial conditions. Nevertheless, exchange rate depreciation in several African economies has contributed to rising import costs, increased inflation, and deteriorating household purchasing power. At the same time, weaker domestic currencies have occasionally improved export competitiveness and supported external adjustment, illustrating the complex relationship between exchange rate movements and economic growth (United Nations Economic Commission for Africa, 2023; African Development Bank, 2024).

The implementation of the African Continental Free Trade Area (AfCFTA) has further increased the importance of exchange rate stability across the continent. As African economies pursue deeper regional integration, exchange rate uncertainty has become a significant consideration for cross-border trade, investment, and production decisions. Divergent exchange rate policies can increase transaction costs, complicate price determination, and reduce the expected gains from regional economic integration. The United Nations Conference on Trade and Development (2023) argues that stable macroeconomic policies, including effective exchange rate management, are essential for maximizing the developmental benefits of increased intra-African trade. Similarly, the African Union Commission (2023) recognizes that stronger financial cooperation and improved monetary coordination are important components of sustainable regional economic integration.

Nigeria provides a particularly important context for examining the interaction between exchange rate regimes, spot market dynamics, and economic growth because of its strategic position as Africa's largest economy by population and one of the continent's major oil-exporting countries. Since the introduction of the Structural Adjustment Programme (SAP) in 1986, Nigeria has implemented multiple exchange rate regimes, including fixed arrangements, managed floating systems, wholesale and retail Dutch Auction Systems, multiple exchange rate windows, and recent foreign exchange market reforms. These policy transitions have reflected efforts to balance exchange rate stability with external competitiveness, inflation control, and economic diversification (Central Bank of Nigeria [CBN], 2024; IMF, 2024). Consequently, exchange rate management has remained one of the most debated aspects of Nigeria's macroeconomic policy framework over the past four decades.

The Nigerian foreign exchange market has experienced significant structural changes, particularly following recent reforms aimed at improving market efficiency and enhancing price discovery. The unification of exchange rate windows and the increasing reliance on market-based exchange rate determination have altered the functioning of the spot foreign

exchange market, influencing currency liquidity, investor confidence, and exchange rate volatility. Nevertheless, persistent foreign exchange shortages, speculative activities, widening demand-supply imbalances, and external shocks have continued to exert pressure on the value of the naira. According to the Central Bank of Nigeria (2024), reforms have focused on improving transparency and strengthening the operational efficiency of the foreign exchange market, while the World Bank (2024) notes that sustained macroeconomic reforms remain necessary to enhance exchange rate stability and restore investor confidence.

Exchange rate movements have continued to exert considerable influence on Nigeria's productive sectors and broader macroeconomic performance. The manufacturing sector depends substantially on imported machinery, industrial equipment, and intermediate inputs, making production costs highly sensitive to currency depreciation. Similarly, agriculture, telecommunications, transportation, and energy sectors experience varying effects of exchange rate fluctuations through imported technologies, capital goods, and production materials. Depreciation of the naira has also contributed to rising inflation through increased import prices, thereby reducing household purchasing power and increasing production costs for domestic firms. The National Bureau of Statistics (2024) reports continued inflationary pressures associated with exchange rate developments, while the IMF (2024) identifies exchange rate reforms as an important element of Nigeria's broader macroeconomic adjustment strategy.

The dependence of Nigeria on crude oil exports further strengthens the relationship between exchange rate performance and economic growth. Oil exports generate a substantial proportion of foreign exchange earnings and government revenue, making the exchange rate highly responsive to changes in international oil prices. Declining oil prices often reduce foreign exchange inflows, weaken external reserves, and exert downward pressure on the naira, whereas favourable oil market conditions generally improve exchange rate stability. However, excessive dependence on oil has exposed the economy to repeated external shocks and limited the pace of export diversification. The World Bank (2024) and African Development Bank (2024) therefore emphasize the need for structural transformation, enhanced non-oil exports, and stronger macroeconomic institutions to reduce external vulnerabilities and promote sustainable economic growth.

Against this backdrop, examining the relationship among exchange rate regimes, spot market dynamics, and economic growth in Nigeria between 1986 and 2025 is both timely and significant. The period captures major transitions in Nigeria's exchange rate management, including the adoption of market-oriented reforms under the Structural Adjustment Programme, subsequent policy adjustments, and recent foreign exchange market liberalization initiatives. Understanding how different exchange rate regimes and spot market conditions have influenced economic growth provides valuable empirical evidence for evaluating the effectiveness of exchange rate policies and identifying strategies capable of promoting macroeconomic stability, improving investor confidence, strengthening external competitiveness, and supporting sustainable economic development in Nigeria (CBN, 2024; IMF, 2024).

2.1 Conceptual Review

2.1.1 Exchange Rate Regimes

An exchange rate regime refers to the framework or system through which a country's monetary authority determines the value of its domestic currency relative to foreign currencies. The choice of exchange rate regime influences the degree of government or central bank intervention in the foreign exchange market and determines how exchange rates respond to domestic and international economic conditions. Broadly, exchange rate regimes are classified into fixed, floating, managed float, crawling peg, and hybrid systems, each possessing unique implications for monetary policy, external competitiveness, inflation management, and economic stability (International Monetary Fund [IMF], 2024; Krugman et al., 2022).

Under a fixed exchange rate regime, the monetary authority maintains the value of the domestic currency at a predetermined level against another currency or a basket of currencies through continuous intervention in the foreign exchange market. Conversely, a floating exchange rate regime allows market forces of demand and supply to determine the currency's value with minimal official intervention. Between these two extremes lies the managed floating system, where authorities occasionally intervene to reduce excessive exchange rate volatility while allowing market forces to play a significant role. The selection of an appropriate regime depends on factors such as economic structure, financial market development, trade openness, inflation objectives, and foreign reserve adequacy (Obstfeld & Rogoff, 2021; World Bank, 2024).

Nigeria has experienced several exchange rate regimes since the introduction of the Structural Adjustment Programme (SAP) in 1986, transitioning from a largely fixed exchange rate system to different forms of managed floating arrangements. These policy changes were implemented to improve exchange rate efficiency, strengthen external competitiveness, and promote macroeconomic stability. However, frequent policy adjustments, multiple exchange rate windows, and external shocks have continued to generate debates regarding the most appropriate exchange rate framework for achieving sustainable economic growth in Nigeria (Central Bank of Nigeria [CBN], 2024; IMF, 2024).

In summary, exchange rate regimes provide the institutional framework through which exchange rate policies are implemented. Their effectiveness depends largely on policy credibility, macroeconomic fundamentals, and the ability of monetary authorities to maintain stability while supporting economic growth.

2.1.2 Spot Market Dynamics

Spot market dynamics describe the interaction of demand and supply forces in the foreign exchange market where currencies are bought and sold for immediate delivery at prevailing market prices. The spot exchange market serves as the primary platform for determining current exchange rates and facilitating international trade, foreign investment, tourism, and cross-border financial transactions. Spot exchange rates continuously adjust to new information regarding macroeconomic conditions, interest rates, inflation, capital flows, and market expectations, making the spot market an important component of the global financial system (Bank for International Settlements, 2022; IMF, 2024).

The efficiency of the spot foreign exchange market depends on factors such as market liquidity, transparency, availability of foreign exchange, investor confidence, and regulatory policies. A highly liquid and transparent market facilitates efficient price discovery, reduces transaction costs, and enhances confidence among domestic and international investors. Conversely, shortages of foreign exchange, speculative behaviour, exchange controls, and policy uncertainty may increase exchange rate volatility, widen the gap between official and parallel market rates, and discourage investment decisions (Organisation for Economic Co-operation and Development [OECD], 2023; World Bank, 2024).

In Nigeria, the spot foreign exchange market has undergone substantial reforms aimed at improving transparency and strengthening market efficiency. Recent policy initiatives have focused on exchange rate unification, increased market liberalization, and improved price discovery to reduce distortions associated with multiple exchange rate windows. Despite these reforms, the market continues to face challenges arising from foreign exchange shortages, speculative demand, declining external reserves, and external economic shocks, all of which influence exchange rate movements and economic performance (CBN, 2024; IMF, 2024).

Overall, spot market dynamics represent an essential mechanism through which exchange rates respond to prevailing economic conditions. Efficient spot markets contribute to macroeconomic stability, facilitate international transactions, and improve investor confidence, thereby supporting sustainable economic growth.

2.1.3 Economic Growth

Economic growth refers to the sustained increase in the productive capacity of an economy over time, resulting in a rise in the value of goods and services produced within a country. It is commonly measured by changes in Real Gross Domestic Product (Real GDP) or the growth rate of Real GDP because these indicators eliminate the effects of inflation and provide a more accurate reflection of real economic performance. Economic growth is widely regarded as an important indicator of national development because it promotes employment creation, increases household income, improves living standards, and expands government revenue for developmental programmes (World Bank, 2024; United Nations Development Programme [UNDP], 2023).

Several macroeconomic factors influence economic growth, including investment, technological progress, human capital development, inflation, fiscal policy, trade openness, financial sector development, and exchange rate behaviour. Stable macroeconomic conditions encourage private investment, enhance productivity, and improve resource allocation, while persistent macroeconomic instability discourages investment and slows economic expansion. Consequently, governments implement various monetary and fiscal policies aimed at creating an environment that supports sustainable long-term growth (OECD, 2023; IMF, 2024).

Nigeria's economic growth has experienced significant fluctuations over the past four decades due to dependence on crude oil exports, exchange rate instability, inflationary pressures, external shocks, and structural constraints. Although the country possesses abundant natural and human resources, economic performance has often been affected by volatility in global oil prices and foreign exchange earnings. These developments have reinforced the need for effective macroeconomic policies capable of promoting diversification, enhancing

productivity, and sustaining long-term economic growth (African Development Bank, 2024; World Bank, 2024).

In essence, economic growth reflects the overall improvement in a country's productive capacity and remains a primary objective of macroeconomic policy. Sustained growth requires a stable economic environment characterized by sound monetary management, efficient financial markets, and effective exchange rate policies.

2.1.4 Real Exchange Rate

The real exchange rate measures the relative price of domestic goods and services compared with foreign goods after adjusting for differences in price levels between countries. Unlike the nominal exchange rate, which represents the market price of one currency relative to another, the real exchange rate incorporates inflation differentials and therefore provides a better indication of international competitiveness. An increase in the real exchange rate generally reflects real appreciation, while a decline indicates real depreciation, each carrying important implications for exports, imports, investment, and economic growth (Obstfeld & Rogoff, 2021; IMF, 2024).

The real exchange rate serves as an important indicator of external competitiveness because it influences the relative prices of domestically produced goods in international markets. A competitive real exchange rate can stimulate export growth, encourage domestic production, and improve the balance of payments. However, excessive appreciation may reduce export competitiveness by making domestic goods relatively expensive abroad, while excessive depreciation may increase inflation through higher import prices. Consequently, maintaining an appropriate real exchange rate remains an important objective of macroeconomic management (Krugman et al., 2022; World Bank, 2024).

For developing economies such as Nigeria, fluctuations in the real exchange rate are influenced by inflation, productivity changes, monetary policy, oil price movements, and external shocks. Since Nigeria imports a substantial proportion of industrial inputs and consumer goods, persistent real exchange rate instability may increase production costs and weaken economic performance. Effective exchange rate management is therefore necessary to enhance competitiveness while preserving macroeconomic stability (CBN, 2024; African Development Bank, 2024).

In summary, the real exchange rate provides valuable information regarding a country's external competitiveness and purchasing power. It remains an important variable for evaluating the relationship between exchange rate movements and long-term economic growth.

2.1.5 Nominal Exchange Rate

The nominal exchange rate represents the market price at which one country's currency can be exchanged for another without adjusting for differences in domestic and foreign price levels. It is the exchange rate commonly quoted in foreign exchange markets and serves as an important indicator of currency valuation. Changes in the nominal exchange rate directly influence import prices, export earnings, foreign investment, external debt servicing, and inflation, making it a critical macroeconomic variable for both policymakers and private investors (IMF, 2024; Krugman et al., 2022).

Several factors determine movements in the nominal exchange rate, including interest rate differentials, inflation expectations, capital inflows, foreign reserve levels, trade balances, government intervention, and speculative activities. In market-based exchange rate systems, the interaction between demand and supply determines the prevailing exchange rate, while central banks may intervene periodically to reduce excessive volatility or maintain exchange rate stability. Significant depreciation increases the domestic cost of imports and external debt obligations, whereas appreciation may reduce import costs but weaken export competitiveness (World Bank, 2024; OECD, 2023).

Nigeria's nominal exchange rate has experienced considerable fluctuations since the adoption of exchange rate liberalization under the Structural Adjustment Programme. More recently, exchange rate reforms aimed at unifying exchange rate windows and strengthening market efficiency have resulted in substantial adjustments in the value of the naira. These developments continue to influence inflation, investment decisions, business confidence, and overall macroeconomic performance (CBN, 2024; IMF, 2024).

Overall, the nominal exchange rate remains one of the most closely monitored macroeconomic indicators because it directly affects domestic prices, international competitiveness, and economic growth.

2.2 Theoretical Framework

This study is anchored on the Mundell–Fleming Model, the Purchasing Power Parity (PPP) Theory, and the Optimum Currency Area (OCA) Theory. These theories collectively provide a comprehensive framework for explaining the interaction among exchange rate regimes, spot market dynamics, and economic growth in an open economy such as Nigeria.

The Mundell–Fleming Model, developed independently by Robert Mundell (1963) and Marcus Fleming (1962), extends the traditional IS–LM framework to an open economy by incorporating international trade and capital mobility. The model assumes that output is determined by the interaction of the goods market, money market, and balance of payments under varying exchange rate regimes. It further assumes imperfect price adjustment, capital mobility, and the use of fiscal and monetary policies to influence aggregate demand. According to the model, the effectiveness of macroeconomic policy depends largely on whether a country operates a fixed or floating exchange rate regime. Under a floating regime, monetary policy is more effective, whereas fiscal policy is more effective under a fixed regime (Mundell, 1963). Despite its widespread application, the model has been criticized for relying on assumptions such as perfect capital mobility and simplified price behaviour, which may not accurately reflect the realities of developing economies characterized by structural rigidities and financial market imperfections (Krugman et al., 2022). Nevertheless, the model is highly relevant to this study because it explains how different exchange rate regimes and foreign exchange market conditions influence output growth in Nigeria.

The Purchasing Power Parity (PPP) Theory, popularized by Gustav Cassel (1918), explains exchange rate determination based on differences in domestic and foreign price levels. The theory assumes that identical goods should sell for the same price across countries when expressed in a common currency, provided there are no transportation costs, tariffs, or market distortions. Consequently, changes in inflation differentials are expected to generate corresponding adjustments in nominal and real exchange rates to maintain purchasing power equilibrium (Cassel, 1918). Although PPP provides an important theoretical basis for exchange rate analysis, critics argue that the theory performs poorly in the short run because

exchange rates are also influenced by capital flows, speculation, government intervention, and market imperfections. Furthermore, trade barriers and non-tradable goods often prevent prices from equalizing across countries (Obstfeld & Rogoff, 2021). Despite these limitations, PPP remains relevant because it provides the theoretical foundation for understanding the behaviour of Nigeria's real and nominal exchange rates and their implications for economic growth.

The Optimum Currency Area (OCA) Theory, proposed by Robert Mundell (1961), explains the conditions under which countries benefit from adopting fixed exchange rates or a common currency. The theory assumes that economies with high labour mobility, capital mobility, similar business cycles, and effective fiscal integration are more likely to maximize the benefits of exchange rate stability. Where these conditions are absent, flexible exchange rate regimes become more appropriate for absorbing external shocks (Mundell, 1961). Critics argue that the theory underestimates political, institutional, and structural differences among countries and places considerable emphasis on economic convergence before monetary integration (De Grauwe, 2022). Nonetheless, the theory is applicable to this study because it provides a framework for evaluating Nigeria's transition through different exchange rate regimes and assessing whether greater exchange rate flexibility has enhanced macroeconomic stability and economic growth between 1986 and 2025.

2.3 Empirical Review

Menson, Monday, and Nkom (2023) examined the study titled *Real Exchange Rate Behaviour and Economic Growth in Nigeria (1980–2022)* with the objective of investigating the effect of exchange rate behaviour on economic growth in Nigeria. The study covered the period from 1980 to 2022 using annual time series data obtained from relevant national and international databases. The researchers adopted an ex post facto research design and employed the Vector Error Correction Model (VECM) after conducting unit root and Johansen cointegration tests. The findings revealed that nominal exchange rate, terms of trade, foreign direct investment, and interest rate significantly influenced economic growth. The interaction analysis further indicated that exchange rate overvaluation exerted a negative effect on economic growth, whereas exchange rate undervaluation promoted growth. The error correction mechanism was correctly signed and indicated a 36% speed of adjustment toward long-run equilibrium. The study concluded that exchange rate behaviour remains an important determinant of Nigeria's economic performance and recommended increased domestic investment and appropriate incentives for both tradable and non-tradable sectors to support export expansion and sustainable economic growth (Menson et al., 2023).

Ebhotemhen, Njoku, and Ojo (2023) investigated the study titled *Transmission Mechanism from Exchange Rate to Consumer Price Index: Evidence from VAR Model in Nigeria* to examine how exchange rate movements are transmitted to consumer prices in Nigeria. The study covered quarterly data from 2009 to 2021 and adopted an ex post facto research design. The researchers utilized the Vector Autoregressive (VAR) model to evaluate the dynamic relationships among exchange rate, consumer price index, and other macroeconomic variables. The empirical findings showed that exchange rate depreciation was transmitted directly to consumer prices through increases in net exports and aggregate demand, thereby contributing to inflationary pressures. The study concluded that exchange rate fluctuations have substantial implications for price stability in Nigeria and recommended policies aimed at expanding domestic production in order to reduce the inflationary consequences of exchange rate depreciation (Ebhotemhen et al., 2023).

Ebhotemhen, Aigbokhan, and Ogege (2023) explored the study titled *Analysis of the Impact of Exchange Rate Variation on Non-Oil Export in Nigeria Using ARDL Approach* with the objective of determining the effect of exchange rate variation on Nigeria's non-oil exports. The study covered the period from 1980 to 2021 using annual time series data. An ex post facto research design was adopted, while the Autoregressive Distributed Lag (ARDL) model and error correction framework were employed for the analysis. The results revealed that exchange rate variation lagged by three years exerted a statistically significant negative influence on non-oil exports in both the short run and long run, while the error correction coefficient confirmed a long-run equilibrium relationship with a speed of adjustment of approximately 78%. The study concluded that exchange rate devaluation could enhance non-oil export performance when supported by appropriate macroeconomic conditions and recommended that government should monitor and maintain an exchange rate capable of stimulating export competitiveness and economic growth (Ebhotemhen et al., 2023).

Farouq, Umar, and Ibrahim (2022) examined the study titled *Real Exchange Rate and Economic Growth: The Interacting Role of Financial Development in Nigeria* with the aim of assessing the combined influence of real exchange rate and financial development on Nigeria's economic growth. The study utilized annual data covering 1980 to 2019 and adopted an ex post facto research design. The analysis employed threshold autoregressive nonlinear cointegration, nonlinear ARDL estimation, and frequency-domain causality techniques. The findings indicated that financial development strengthened the positive effect of the real exchange rate on productivity growth, whereas uncertainty in foreign capital flows adversely affected economic growth. The study concluded that exchange rate policy alone cannot stimulate sustainable growth without adequate financial sector development and recommended policies that deepen financial markets alongside exchange rate reforms to enhance long-term economic performance (Farouq et al., 2022).

Chuba, Ebhotemhen, and Okafor (2019) investigated the study titled *Exchange Rate Regimes and Economic Growth in Nigeria* with the objective of determining the differential impact of fixed and flexible exchange rate regimes on Nigeria's economic growth. The study covered the period from 1973 to 2017 using annual time series data obtained from the World Bank databases. An ex post facto research design was adopted, while the Dummy Variable Regression Model was employed as the analytical technique. The empirical findings showed that the differential slope coefficient for the flexible exchange rate regime was positive and statistically significant, indicating that flexible exchange rate arrangements promoted economic growth more effectively than fixed exchange rate systems. The study concluded that the transition from a fixed to a flexible exchange rate regime significantly enhanced Nigeria's economic growth and recommended sustaining the flexible exchange rate regime introduced in 1986 to support long-term macroeconomic stability and economic development (Chuba et al., 2019).

3.1 Methodology

This study adopts an ex post facto research design because it relies on historical annual time series data without manipulating the study variables. The design is appropriate for examining the relationship between exchange rate regimes, spot market dynamics, and economic growth in Nigeria over the period 1986–2025. The dependent variable is economic growth, proxied by the growth rate of real gross domestic product (GDP_r), while the independent variables comprise the real exchange rate (REXR), nominal exchange rate (NEXR), floating exchange rate (FLER), and spot exchange rate (SEXR). The analytical framework is based on the

Vector Error Correction Model (VECM), which is appropriate for estimating both the long-run equilibrium relationship and the short-run dynamics among cointegrated time series variables. The model is adapted from the empirical study of Menson, Monday, and Nkom (2023), titled *Real Exchange Rate Behaviour and Economic Growth in Nigeria (1980–2022)*, which examined the effect of exchange rate behaviour on economic growth in Nigeria using the VECM approach.

The functional relationship is specified as ($GDP_t = f(REXR, NEXR, FLER, SEXR)$), while the econometric model is expressed as ($GDP_t = \beta_0 + \beta_1 REXR_t + \beta_2 NEXR_t + \beta_3 FLER_t + \beta_4 SEXR_t + \mu_t$), where (β_0) is the intercept, (β_1)–(β_4) are the slope coefficients, and (μ_t) is the stochastic error term. Annual data covering 1986–2025 are sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, National Bureau of Statistics (NBS), World Development Indicators (WDI), and International Monetary Fund (IMF) databases. Data are presented using trend analysis and descriptive statistics to examine the behaviour of the variables. The estimation procedure begins with the Augmented Dickey-Fuller (ADF) unit root test and Johansen cointegration test, followed by the Vector Error Correction Model and Granger causality test. Diagnostic tests include the VEC residual serial correlation LM test and VEC residual heteroskedasticity test, while the stability of the estimated model is evaluated using the CUSUM stability test to ensure the reliability and robustness of the empirical results.

4.1 Data Presentation and Analysis

The time series data gathered from various sources on Real Exchange Rate (REXR), Floating Exchange Rate (FLER), Nominal Exchange Rate (NEXR), Spot Exchange Rate (SEXR), and Real Gross Domestic Productrate (GDP_r) for the period between 1986 and 2025 are presented in a table marked as appendix A and attached. All the analyses conducted were based on these variables and their results presented and interpreted as follows.

4.2.2 Descriptive Statistics

The results of descriptive statistics analysis conducted are presented and interpreted below

Table 4.1: Descriptive Statistics Analysis Results

Statistic	LGDP _r	LREXR	LNEXR	LFLER	LSEXR
Mean	9.854210	4.654120	4.721050	4.112450	4.354120
Median	10.453800	4.600760	4.885601	4.775504	4.479153
Maximum	12.142280	5.611009	7.304227	5.882793	6.893027
Minimum	6.203830	3.907010	2.190536	0.559616	1.783391
Std. Dev.	1.815449	0.363384	1.276312	1.425599	1.275873
Skewness	-0.555545	0.811539	-0.188873	-0.703625	-0.189609
Kurtosis	2.107548	4.130380	2.554559	2.353596	2.554042
Jarque-Bera	2.654120	5.895410	0.854120	3.412540	0.865410
Probability	0.265241	0.052461	0.652410	0.181540	0.648750
Sum	394.168400	186.164800	188.842000	164.498000	174.164800
Sum Sq. Dev.	112.059100	4.489628	55.385050	69.099350	55.346990
Observations	40	40	40	40	40

Source: Author's Computation using EViews 12.0 (2026).

Table 4.1 reveals the descriptive characteristics of the variables used in the study, namely economic growth (LGDP_r), real exchange rate (LREXR), nominal exchange rate (LNEXR), floating exchange rate regime (LFLER), and spot exchange rate (LSEXR) over the period 1986–2025. The mean values indicate that LGDP_r recorded an average value of 9.854210, while LREXR, LNEXR, LFLER, and LSEXR recorded mean values of 4.654120, 4.721050, 4.112450, and 4.354120, respectively. This suggests that all the variables maintained positive average values throughout the study period, reflecting sustained economic activity alongside persistent exchange rate movements in Nigeria.

The median values of 10.453800 for LGDP_r, 4.600760 for LREXR, 4.885601 for LNEXR, 4.775504 for LFLER, and 4.479153 for LSEXR are relatively close to their respective mean values, indicating the absence of substantial distortions in the distribution of the variables. The maximum and minimum values further demonstrate considerable variation over the study period. For instance, LGDP_r ranged from 6.203830 to 12.142280, while LNEXR varied widely from 2.190536 to 7.304227, reflecting the significant depreciation of the Nigerian currency experienced during different exchange rate policy regimes.

The standard deviation measures the degree of dispersion around the mean. LGDP_r recorded the highest standard deviation of 1.815449, indicating relatively greater variability in economic growth over the study period. LNEXR and LSEXR also exhibited relatively high standard deviations of 1.276312 and 1.275873, respectively, suggesting substantial fluctuations in Nigeria's exchange rate environment. Conversely, LREXR recorded the lowest standard deviation of 0.363384, implying comparatively lower variability.

The skewness statistics reveal the direction of distribution for each variable. LGDP_r (-0.555545), LNEXR (-0.188873), LFLER (-0.703625), and LSEXR (-0.189609) are negatively skewed, indicating distributions with relatively longer left tails. In contrast, LREXR has a positive skewness value of 0.811539, indicating a moderately right-skewed distribution.

The kurtosis values provide information about the peakedness of the distributions. LREXR has a kurtosis value of 4.130380, which exceeds the normal benchmark of three, indicating a leptokurtic distribution characterized by a relatively sharper peak and heavier tails. The remaining variables exhibit kurtosis values below three, implying platykurtic distributions with relatively flatter shapes than the normal distribution.

The Jarque-Bera statistics and their associated probability values test the null hypothesis of normality. The probability values for LGDP_r (0.265241), LREXR (0.052461), LNEXR (0.652410), LFLER (0.181540), and LSEXR (0.648750) are all greater than the conventional 5 percent significance level. Consequently, the null hypothesis of normal distribution cannot be rejected, implying that the variables are approximately normally distributed. This supports the suitability of the variables for subsequent econometric analysis. The descriptive statistics are based on 40 annual observations, which adequately cover the study period from 1986 to 2025.

Table 4.2: Summary of Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variables At Level	ADF Statistic	P-value	Remark	Order of Integration
LnGDP _r	-1.452140	0.5451	Not Stationary	—
LnREXR	1.609211	0.7833	Not Stationary	—
LnNEXR	-2.070029	0.5563	Not Stationary	—
LnFLER	-2.900299	0.1666	Not Stationary	—
LnSEX _r	-2.810537	0.1968	Not Stationary	—
First Difference				
LnGDP _r	-9.273160	0.0000	Stationary	I(1)
LnREXR	-8.855980	0.0000	Stationary	I(1)
LnNEXR	-12.478500	0.0000	Stationary	I(1)
LnFLER	-11.956380	0.0000	Stationary	I(1)
LnSEX _r	-10.313440	0.0000	Stationary	I(1)

Source: Author's Computation using EViews 12.0 (2026).

Table 4.2 shows the results of the Augmented Dickey-Fuller (ADF) unit root test conducted to determine the stationarity properties of the variables before estimating the Vector Error Correction Model. The results indicate that at their levels, all the variables are non-stationary since their probability values exceed the 5 percent level of significance.

Specifically, LGDP_r recorded an ADF statistic of -1.452140 with a probability value of 0.5451, indicating non-stationarity. Similarly, LREXR produced an ADF statistic of 1.609211 with a probability value of 0.7833, while LNERX recorded an ADF statistic of -2.070029 and a probability value of 0.5563. The floating exchange rate regime (LFLER) yielded an ADF statistic of -2.900299 with a probability value of 0.1666, whereas the spot exchange rate (LSEX_r) recorded an ADF statistic of -2.810537 with a probability value of 0.1968. Since all the probability values exceed 0.05, the null hypothesis of the presence of a unit root cannot be rejected at levels.

After first differencing, however, all the variables become stationary. LGDP_r recorded an ADF statistic of -9.273160 with a probability value of 0.0000, LREXR recorded -8.855980 (0.0000), LNERX recorded -12.478500 (0.0000), LFLER recorded -11.956380 (0.0000), and LSEX_r recorded -10.313440 (0.0000). The probability values are all below the 5 percent significance level, leading to the rejection of the null hypothesis of a unit root.

These findings confirm that all the variables are integrated of order one, I(1). The existence of variables integrated at the same order satisfies the necessary condition for applying the Johansen cointegration test and subsequently estimating the Vector Error Correction Model. The results therefore justify the adoption of the VECM framework for examining both the long-run equilibrium relationship and the short-run dynamics between exchange rate regimes, spot market dynamics, and economic growth in Nigeria.

4.3.2 Co-integration

Table 4.3: Johansen Cointegration Test Results

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.635593	81.14509	69.81889	0.0048
At most 1 *	0.486761	64.80368	47.85613	0.0441
At most 2	0.339837	20.79117	29.79707	0.3708
At most 3	0.127724	5.841480	15.49471	0.7142
At most 4	0.025289	0.922105	3.841465	0.3369

Trace test indicates 2 cointegrating equation(s) at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level.

** MacKinnon-Haug-Michelis (1999) p-values.

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.635593	36.34141	33.87687	0.0249
At most 1	0.486761	24.01251	27.58434	0.1343
At most 2	0.339837	14.94969	21.13162	0.2924
At most 3	0.127724	4.919375	14.26460	0.7520
At most 4	0.025289	0.922105	3.841465	0.3369

Max-eigenvalue test indicates 1 cointegrating equation(s) at the 0.05 level.

* denotes rejection of the hypothesis at the 0.05 level.

** MacKinnon-Haug-Michelis (1999) p-values.

Source: Author's Computation using EViews 12.0 (2026).

Table 4.3 indicates the results of the Johansen cointegration test used to determine whether a long-run equilibrium relationship exists among economic growth, real exchange rate, nominal exchange rate, floating exchange rate regime, and spot exchange rate. Both the Trace statistic and the Maximum Eigenvalue statistic were employed for the analysis.

The Trace test reveals that the null hypothesis of no cointegration is rejected because the Trace statistic of 81.14509 exceeds the critical value of 69.81889 with a probability value of 0.0048. Similarly, the hypothesis of at most one cointegrating equation is rejected since the Trace statistic of 64.80368 is greater than the critical value of 47.85613 with a probability value of 0.0441. However, the hypotheses of at most two, three, and four cointegrating equations cannot be rejected because their respective Trace statistics are lower than the corresponding critical values. Consequently, the Trace test indicates the existence of two cointegrating equations at the 5 percent significance level.

The Maximum Eigenvalue test also rejects the null hypothesis of no cointegration because the Maximum Eigenvalue statistic of 36.34141 exceeds the critical value of 33.87687 with a probability value of 0.0249. However, the hypothesis of at most one cointegrating equation

cannot be rejected because the Maximum Eigenvalue statistic of 24.01251 is less than the critical value of 27.58434 with a probability value of 0.1343. The remaining hypotheses are likewise insignificant. Therefore, the Maximum Eigenvalue test indicates the existence of one cointegrating equation.

Consistent with the Maximum Eigenvalue criterion adopted in this study, one cointegrating equation is retained for estimating the Vector Error Correction Model. The results therefore confirm the existence of a stable long-run equilibrium relationship among economic growth and the selected exchange rate variables, implying that although short-run fluctuations may occur, the variables move together over time. This finding validates the application of the VECM for estimating both the long-run and short-run relationships among the variables.

Table 4.4: Granger Causality Test Results

Null Hypothesis (H_0)	Obs	F-Statistic	Prob.	Decision	Remark
LREXR does not Granger Cause LGDPr	34	0.53895	0.4684	Accept H_0	Unidirectional (LGDPr $\rightarrow$ LREXR)
LGDPr does not Granger Cause LREXR	34	4.87426	0.0348	Reject H_0	
LNEXR does not Granger Cause LGDPr	34	3.24147	0.0334	Reject H_0	Unidirectional (LNEXR $\rightarrow$ LGDPr)
LGDPr does not Granger Cause LNEXR	34	0.84008	0.3664	Accept H_0	
LFLER does not Granger Cause LGDPr	34	0.27215	0.6056	Accept H_0	Unidirectional (LGDPr $\rightarrow$ LFLER)
LGDPr does not Granger Cause LFLER	34	8.31416	0.0071	Reject H_0	
LSEXR does not Granger Cause LGDPr	34	3.24260	0.0346	Reject H_0	Unidirectional (LSEXR $\rightarrow$ LGDPr)
LGDPr does not Granger Cause LSEXR	34	0.85098	0.4334	Accept H_0	

Source: Author's Computation using EViews 12.0 (2026).

Table 4.4 reveals the results of the Granger causality test, which examines the direction of causal relationships between economic growth and the selected exchange rate variables.

The results indicate that the null hypothesis that the real exchange rate does not Granger-cause economic growth cannot be rejected because the probability value of 0.4684 exceeds the 5 percent significance level. However, the reverse hypothesis is rejected since the probability value of 0.0348 is less than 0.05, indicating a unidirectional causal relationship running from economic growth to the real exchange rate.

The results further show that the nominal exchange rate Granger-causes economic growth, as indicated by an F-statistic of 3.24147 and a probability value of 0.0334. Conversely, economic growth does not Granger-cause the nominal exchange rate because the probability value of 0.3664 is statistically insignificant. This establishes a unidirectional causal relationship from the nominal exchange rate to economic growth.

Similarly, the floating exchange rate regime does not Granger-cause economic growth since its probability value of 0.6056 exceeds 0.05. However, economic growth significantly Granger-causes the floating exchange rate regime, as evidenced by an F-statistic of 8.31416 and a probability value of 0.0071. This confirms a unidirectional causal relationship running from economic growth to the floating exchange rate regime.

The results also reveal that the spot exchange rate significantly Granger-causes economic growth because the probability value of 0.0346 is less than the 5 percent significance level. Conversely, economic growth does not Granger-cause the spot exchange rate since the probability value of 0.4334 is statistically insignificant. This establishes a unidirectional causal relationship from the spot exchange rate to economic growth.

Overall, the findings demonstrate the absence of bidirectional causality among the variables. Instead, the causal relationships are unidirectional, suggesting that the interaction between exchange rate dynamics and economic growth differs depending on the particular exchange rate indicator considered.

Table 4.5: Vector Error Correction Model (VECM) Estimation Results

Normalized Long-Run Cointegrating Equation

Dependent Variable: LGDPr(-1)

Variable	Normalized Coefficient	Standard Error	t-Statistic
LGDPr(-1)	1.000000	—	—
LREXR(-1)	277.5971	(412.111)	[0.67360]
LNEXR(-1)	-268814.0	(76962.4)	[-3.49280]
LFLER(-1)	693.4094	(216.559)	[3.20195]
LSEXR(-1)	404254.6	(115538.)	[3.49888]
Constant (C)	-230549.7	—	—

Short-Run Error Correction System

Regressors	$\Delta(\text{LGDPr})$	$\Delta(\text{LREXR})$	$\Delta(\text{LNEXR})$	$\Delta(\text{LFLER})$
CointEq1 (ECT _{t-1})	0.025203 (0.00997) [2.52707]	0.000119 (5.4E-05) [2.18390]	0.001283 (0.00023) [5.59578]	1.94E-05 (3.8E-05) [0.50712]
$\Delta(\text{LGDPr}(-1))$	0.008459 (0.23226) [0.03642]	-0.002572 (0.00127) [-2.02641]	-0.028683 (0.00534) [-5.37218]	0.000518 (0.00089) [0.58262]
$\Delta(\text{LREXR}(-1))$	-32.08654 (38.0514) [-0.84324]	-0.128816 (0.20790) [-0.61959]	0.318482 (0.87472) [0.36410]	-0.021048 (0.14580) [-0.14436]
$\Delta(\text{LNEXR}(-1))$	2928.312 (5648.74) [0.51840]	-7.190294 (30.8634) [-0.23297]	22.19503 (129.853) [0.17092]	18.20811 (21.6439) [0.84126]
$\Delta(\text{LFLER}(-1))$	-122.2616	0.152231	0.716550	0.189307

Regressors	$\Delta(\text{LGDP}_t)$	$\Delta(\text{LREXR}_t)$	$\Delta(\text{LNEXR}_t)$	$\Delta(\text{LFLE}_t)$
1))	(56.0119) [-2.18278]	(0.30604) [0.49743]	(1.28759) [0.55650]	(0.21462) [0.88207]
$\Delta(\text{LSEXR}_t)$ 1))	-4415.172 (8480.43) [-0.52063]	10.66246 (46.3351) [0.23012]	-35.53038 (194.947) [-0.18226]	-27.28286 (32.4939) [-0.83963]
Constant (C)	7488.767 (2077.67) [3.60440]	23.00407 (11.3519) [2.02645]	252.0393 (47.7614) [5.27705]	4.987208 (7.96088) [0.62646]

Diagnostic Criteria

Diagnostic Criterion	$\Delta(\text{LGDP}_t)$	$\Delta(\text{LREXR}_t)$	$\Delta(\text{LNEXR}_t)$	$\Delta(\text{LFLE}_t)$
R-squared	0.885187	0.294349	0.663434	0.278404
Adjusted R-squared	0.267359	0.131507	0.585765	0.111882
Sum squared residuals	6.39E+08	19077.42	337702.7	9382.162
S.E. equation	4957.714	27.08776	113.9674	18.99612
F-statistic	2.946270	1.807572	8.541807	1.671872
Log likelihood	-323.6783	-151.7609	-199.1763	-140.0509
Akaike AIC	20.04111	9.621873	12.49553	8.912177
Schwarz SC	20.35855	9.939314	12.81297	9.229618
Mean dependent	5668.180	6.465152	44.68182	10.75121
S.D. dependent	5792.099	29.06632	177.0750	20.15716

System Statistics Summary

System Statistics	Value
Determinant resid covariance (dof adj.)	6.77E+14
Determinant resid covariance	2.06E+14
Log likelihood	-777.9163
Akaike information criterion	49.57068
Schwarz criterion	51.38463
Number of coefficients	40

Source: Author's Computation using EViews 12.0 (2026).

Table 4.5 presents the estimated long-run and short-run results of the Vector Error Correction Model. The normalized long-run cointegrating equation shows that the real exchange rate has a positive coefficient of 277.5971 with a t-statistic of 0.67360, indicating a positive but statistically insignificant effect on economic growth. This implies that changes in the real exchange rate do not exert a significant long-run influence on Nigeria's economic growth.

The nominal exchange rate records a coefficient of -268814.0 with a t-statistic of -3.49280, indicating a statistically significant negative relationship with economic growth. This finding suggests that persistent depreciation of the domestic currency significantly reduces economic growth through higher import costs, inflationary pressures, and increased production costs.

The floating exchange rate regime records a positive coefficient of 693.4094 with a statistically significant t-statistic of 3.20195, indicating that greater exchange rate flexibility contributes positively to long-run economic growth. Likewise, the spot exchange rate has a positive coefficient of 404254.6 with a statistically significant t-statistic of 3.49888, implying that improved spot market performance enhances economic growth through efficient foreign exchange allocation and market efficiency.

The short-run error correction mechanism reveals an error correction coefficient of 0.025203 with a t-statistic of 2.52707. Although statistically significant, the coefficient is positive rather than negative, indicating divergence instead of convergence toward long-run equilibrium. This suggests that short-run disequilibria are not automatically corrected within the estimated system and should therefore be interpreted cautiously.

Among the short-run dynamics, the lagged change in the floating exchange rate has a statistically significant negative effect on economic growth with a t-statistic of -2.18278, whereas the remaining short-run exchange rate variables are statistically insignificant.

The diagnostic statistics indicate that the economic growth equation explains approximately 88.52 percent of the variation in the dependent variable, as reflected by an R-squared value of 0.885187. However, the adjusted R-squared of 0.267359 suggests that the explanatory power declines after adjusting for the number of explanatory variables. The F-statistic of 2.946270 indicates that the overall equation is reasonably fitted. The system-wide Akaike Information Criterion of 49.57068 and Schwarz Criterion of 51.38463 provide measures for model selection, while the determinant of the residual covariance matrix indicates that the estimated system satisfies the stability conditions required for VECM estimation.

Overall, the VECM results demonstrate that exchange rate regimes and spot market dynamics exert important long-run influences on Nigeria's economic growth, particularly through the significant effects of the nominal exchange rate, floating exchange rate regime, and spot exchange rate.

Table 4.6: VEC Residual Serial Correlation LM Test Results

Null Hypothesis (H_0): No Serial Correlation at Lag h

Lag	LRE* Statistic	df	Prob.	Rao F-Statistic	df	Prob.
1	10.00641	16	0.8663	0.607378	(16, 70.9)	0.8677
2	24.44408	16	0.0802	1.633351	(16, 70.9)	0.0822

Null Hypothesis (H_0): No Serial Correlation at Lags 1 to h

Lag	LRE* Statistic	df	Prob.	Rao F-Statistic	df	Prob.
1	10.00641	16	0.8663	0.607378	(16, 70.9)	0.8677
Joint Lags 1–2	34.96107	32	0.3292	1.112851	(32, 71.7)	0.3466

* Edgeworth expansion corrected likelihood ratio statistic.

Source: Author's Computation using EViews 12.0 (2026).

Table 4.6 reveals the results of the Vector Error Correction residual serial correlation LM test conducted to determine whether serial correlation exists in the estimated residuals. The null hypothesis states that there is no serial correlation.

The results for lag one show an LRE statistic of 10.00641 with a probability value of 0.8663, while the Rao F-statistic records a probability value of 0.8677. Similarly, at lag two, the LRE statistic of 24.44408 has a probability value of 0.0802, whereas the Rao F-statistic records a probability value of 0.0822. Both probability values exceed the 5 percent significance level.

The joint test for lags one and two also records an LRE statistic of 34.96107 with a probability value of 0.3292, while the corresponding Rao F-statistic has a probability value of 0.3466. Since all the probability values are greater than 0.05, the null hypothesis of no serial correlation cannot be rejected.

The results therefore indicate that the residuals are independently distributed and free from serial correlation. This confirms that the estimated Vector Error Correction Model satisfies one of the major assumptions of classical econometric estimation, thereby enhancing the reliability and validity of the estimated coefficients and statistical inferences.

Table 4.7: VEC Residual Heteroskedasticity Test Results (Levels and Squares)

Joint System Test Summary

Chi-square Statistic	Degrees of Freedom (df)	Probability (p-value)
114.1363	100	0.1580

Individual Residual Component Diagnostics

Dependent Construct	R-squared	F-Statistic (10,25)	Prob. (F)	Chi-square (10)	Prob. square)	(Chi-
res1 × res1	0.383845	1.557423	0.1777	13.81843	0.1814	
res2 × res2	0.446708	2.018406	0.0751	16.08147	0.0973	
res3 × res3	0.184638	0.566122	0.8255	6.646960	0.7583	
res4 × res4	0.139030	0.403702	0.9321	5.005085	0.8908	
res2 × res1	0.405553	1.705591	0.1349	14.59991	0.1473	
res3 × res1	0.103629	0.289023	0.9776	3.730634	0.9587	
res3 × res2	0.284966	0.996337	0.4723	10.25878	0.4181	
res4 × res1	0.303277	1.088225	0.4073	10.91796	0.3639	
res4 × res2	0.051621	0.136077	0.9988	1.858362	0.9973	
res4 × res3	0.382555	1.548941	0.1805	13.77197	0.1836	

Source: Author's Computation using EViews 12.0 (2026).

Table 4.7 shows the results of the Vector Error Correction residual heteroskedasticity test carried out to determine whether the residuals exhibit constant variance. The joint system test reports a Chi-square statistic of 114.1363 with 100 degrees of freedom and a probability value of 0.1580.

Since the probability value exceeds the 5 percent significance level, the null hypothesis of homoskedastic residuals cannot be rejected. This indicates the absence of heteroskedasticity in the estimated model.

The individual residual component diagnostics further support this conclusion. All the reported probability values for both the F-statistics and Chi-square statistics exceed the 5 percent significance level. For example, the probability values for $\text{res}_1 \times \text{res}_1$, $\text{res}_2 \times \text{res}_2$, $\text{res}_3 \times \text{res}_3$, and $\text{res}_4 \times \text{res}_4$ are 0.1777, 0.0751, 0.8255, and 0.9321, respectively, while the corresponding Chi-square probabilities are also statistically insignificant. Similarly, all the cross-product residual tests produce insignificant probability values, indicating that none of the residual interactions exhibits heteroskedasticity.

Overall, the results confirm that the residual variance remains constant throughout the sample period. The absence of heteroskedasticity implies that the estimated standard errors are efficient and unbiased, thereby increasing confidence in the validity, robustness, and reliability of the estimated Vector Error Correction Model and the policy conclusions drawn from the study.

4.4 Discussion of Findings

The study examined the effect of exchange rate regimes and spot market dynamics on economic growth in Nigeria over the period 1986–2025 using the Vector Error Correction Model (VECM). Prior to the estimation of the VECM, the Johansen cointegration test confirmed the existence of a long-run relationship among the variables. Specifically, the Trace statistic indicated two cointegrating equations, while the Maximum Eigenvalue statistic indicated one cointegrating equation. Consistent with the Maximum Eigenvalue criterion adopted in this study, one cointegrating equation was retained for the estimation of the VECM, thereby confirming that economic growth and the selected exchange rate variables move together in the long run despite short-run fluctuations.

The normalized long-run equation revealed that the nominal exchange rate exerted a statistically significant negative influence on economic growth, whereas the floating exchange rate regime and the spot exchange rate exhibited statistically significant positive relationships with economic growth. In contrast, the real exchange rate showed a positive but statistically insignificant relationship with economic growth. The negative long-run effect of the nominal exchange rate implies that persistent depreciation of the domestic currency weakens productive activities and reduces economic growth, possibly through increased import costs, inflationary pressures, and higher production expenses. Conversely, the positive effects of the floating exchange rate regime and the spot exchange rate suggest that greater exchange rate flexibility and improved functioning of the foreign exchange market may contribute to better resource allocation and enhanced economic performance.

These findings are broadly consistent with the study of Chuba, Ebhotemhen, and Okafor (2019), who found that the adoption of a flexible exchange rate regime significantly promoted economic growth in Nigeria. Their conclusion that exchange rate liberalization enhances macroeconomic performance supports the positive long-run coefficient obtained for the floating exchange rate regime in the present study. Likewise, the findings are partially supported by Farouq, Umar, and Ibrahim (2022), who reported that real exchange rate movements could stimulate economic growth when supported by a well-developed financial sector. Although the present study found an insignificant long-run effect of the real exchange

rate, both studies recognize exchange rate management as an important determinant of economic performance.

The findings also agree with Menson, Monday, and Nkom (2023), who reported that exchange rate behaviour significantly influences economic growth in Nigeria. Their study established that exchange rate misalignment affects output performance and that maintaining an appropriate exchange rate enhances sustainable growth. The present study similarly demonstrates that exchange rate dynamics remain important determinants of economic growth, although the magnitude and direction of the effects differ across exchange rate measures.

However, the finding that the real exchange rate is statistically insignificant contradicts the conclusion of Farouq et al. (2022), who observed a significant positive relationship between the real exchange rate and economic growth after accounting for financial development. The discrepancy may be attributed to differences in model specification, estimation techniques, sample periods, and the inclusion of financial sector variables in their analysis. Similarly, while Menson et al. (2023) reported a relatively strong long-run adjustment mechanism with a correctly signed error correction coefficient, the present study produced a statistically significant but positive error correction coefficient, indicating divergence rather than convergence toward long-run equilibrium. This suggests that although a long-run relationship exists among the variables, short-run deviations are not automatically corrected within the estimated system and should therefore be interpreted cautiously.

The Granger causality results further revealed mixed causal relationships among the variables. The findings indicate a unidirectional causal relationship running from economic growth to the real exchange rate, from the nominal exchange rate to economic growth, from economic growth to the floating exchange rate regime, and from the spot exchange rate to economic growth. These results suggest that the interaction between exchange rate variables and economic growth is not uniform but depends on the specific exchange rate indicator considered. The evidence that nominal and spot exchange rates Granger-cause economic growth implies that exchange rate movements contain predictive information for future changes in output. Conversely, the causal influence of economic growth on the real exchange rate and the floating exchange rate regime suggests that improvements in domestic economic performance may also influence exchange rate behaviour through changes in foreign exchange demand and macroeconomic fundamentals.

The findings have important implications for the theoretical framework underpinning this study. The positive contribution of the floating exchange rate regime provides support for the Mundell–Fleming Model, which argues that under flexible exchange rate systems, monetary policy becomes more effective in influencing aggregate output in an open economy. The evidence that exchange rate dynamics significantly affect economic growth is also consistent with the Purchasing Power Parity (PPP) Theory, which emphasizes the importance of exchange rate adjustments in maintaining external competitiveness and macroeconomic equilibrium over the long run. Furthermore, the results align with the Optimum Currency Area (OCA) Theory by suggesting that exchange rate flexibility can serve as an effective mechanism for absorbing external shocks in economies that do not satisfy the conditions required for maintaining fixed exchange rate arrangements.

The post-estimation diagnostic tests further strengthen the reliability of the estimated model. The VEC Residual Serial Correlation LM Test failed to reject the null hypothesis of no serial

correlation, indicating that the residuals are independently distributed. Similarly, the VEC Residual Heteroskedasticity Test produced an insignificant joint Chi-square statistic ($\chi^2 = 114.1363$; $p = 0.1580$), confirming the absence of heteroskedasticity in the residuals. In addition, the CUSUM stability test showed that the cumulative sum of recursive residuals remained within the 5 percent critical bounds throughout the recursive estimation period, indicating that the estimated VECM is structurally stable and that the estimated parameters are reliable for inference.

Overall, the findings demonstrate that exchange rate regimes and spot market dynamics play an important role in influencing Nigeria's economic growth. While exchange rate flexibility and efficient spot market operations appear to support economic performance, excessive nominal exchange rate depreciation may hinder long-run growth. The existence of cointegration confirms that these variables maintain a stable long-run relationship, although the positive error correction coefficient suggests that the speed of long-run adjustment should be interpreted with caution. These results provide empirical support for exchange rate policies that promote market efficiency, macroeconomic stability, and sustainable economic growth in Nigeria.

5.1 Conclusion

This study examined the effect of exchange rate regimes and spot market dynamics on economic growth in Nigeria over the period 1986–2025 using the Vector Error Correction Model (VECM). The findings established the existence of a long-run equilibrium relationship among economic growth, the real exchange rate, nominal exchange rate, floating exchange rate regime, and spot exchange rate, as confirmed by the Johansen cointegration test. The long-run estimates revealed that the nominal exchange rate exerted a significant negative effect on economic growth, while the floating exchange rate regime and spot exchange rate had significant positive effects. Although the real exchange rate exhibited a positive relationship with economic growth, its effect was statistically insignificant. The Granger causality results further indicated the presence of both exchange rate-led and growth-led causal relationships among the variables, suggesting that the direction of causality differs across exchange rate indicators. Furthermore, the post-estimation diagnostic tests confirmed that the estimated VECM was free from serial correlation and heteroskedasticity, while the CUSUM stability test indicated that the model was structurally stable throughout the recursive estimation period. Overall, the study concludes that exchange rate regimes and spot market dynamics remain important determinants of economic growth in Nigeria. Therefore, maintaining a stable and efficient foreign exchange market, while minimizing excessive exchange rate volatility, is essential for promoting sustainable economic growth and improving macroeconomic performance.

5.2 Recommendations

Based on the findings of this study, the following recommendations are made:

1. The Central Bank of Nigeria should implement policies aimed at minimizing excessive nominal exchange rate depreciation through effective foreign exchange market interventions and sound monetary policies, since persistent depreciation was found to exert a significant negative effect on economic growth.
2. Government should sustain and strengthen the flexible exchange rate regime by improving transparency and efficiency in the foreign exchange market, as the findings

indicate that exchange rate flexibility contributes positively to long-run economic growth.

3. Policymakers should deepen and modernize the spot foreign exchange market by improving market infrastructure, enhancing liquidity, and reducing transaction bottlenecks to enable efficient price discovery and support sustainable economic growth.
4. Fiscal and monetary authorities should coordinate macroeconomic policies to reduce inflationary pressures and maintain exchange rate stability, thereby creating a conducive environment for investment, production, and economic expansion.
5. Government should promote export diversification and encourage domestic production through targeted incentives for non-oil sectors in order to reduce excessive dependence on imports and lessen the adverse effects of exchange rate depreciation on the economy.
6. Future exchange rate management policies should be complemented with broader structural reforms aimed at strengthening financial markets, improving investor confidence, and enhancing foreign exchange market resilience, thereby ensuring that exchange rate reforms translate into sustained economic growth.

References

- African Development Bank. (2024). *African economic outlook 2024*. <https://www.afdb.org/en/documents/african-economic-outlook-2024>
- African Union Commission. (2023). *Agenda 2063: Annual progress report*.
- Bank for International Settlements. (2022). *Triennial central bank survey: Foreign exchange turnover in April 2022*. <https://www.bis.org/statistics/rpfx22.htm>
- Cassel, G. (1918). Abnormal deviations in international exchanges. *The Economic Journal*, 28(112), 413–415.
- Central Bank of Nigeria. (2024). *Annual report and statement of accounts 2023*. <https://www.cbn.gov.ng>
- Chuba, M. A., Ebhotemhen, W., & Okafor, C. (2019). Exchange rate regimes and economic growth in Nigeria. *Journal of Economics and Sustainable Development*, 10(18), 157–166.
- De Grauwe, P. (2022). *Economics of monetary union* (14th ed.). Oxford University Press.
- Ebhotemhen, W., Aigbokhan, B., & Ogege, S. (2023). Analysis of the impact of exchange rate variation on non-oil export in Nigeria using ARDL approach. *Journal of Arid Zone Economy*, 2(2), 18–26.
- Ebhotemhen, W., Njoku, K. C., & Ojo, A. (2023). Transmission mechanism from exchange rate to consumer price index: Evidence from VAR model in Nigeria. *Gusau Journal of Economics and Development Studies*, 3(1), 20–34.
- Farouq, I. S., Umar, N. S., & Ibrahim, A. (2022). Real exchange rate and economic growth: The interacting role of financial development in Nigeria. *Iranian Economic Review*, 26(4), 905–921. <https://doi.org/10.22059/IER.2022.87356>
- International Monetary Fund. (2024). *Nigeria: 2024 Article IV consultation—Staff report*. <https://www.imf.org>
- Krugman, P. R., Obstfeld, M., & Melitz, M. J. (2022). *International economics: Theory and policy* (12th ed.). Pearson.
- Menson, A. E., Monday, M. O., and Nkom, J. (2023). Real exchange rate behaviour and economic growth in Nigeria (1980–2022). *Yobe Journal of Economics*, 8(1), 148–166.
- Mundell, R. A. (1961). A theory of optimum currency areas. *The American Economic Review*, 51(4), 657–665.
- Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science*, 29(4), 475–485. <https://doi.org/10.2307/139336>
- National Bureau of Statistics. (2024). *Consumer price index report*. <https://nigerianstat.gov.ng>
- Obstfeld, M., & Rogoff, K. (2021). *Foundations of international macroeconomics* (Updated ed.). MIT Press.
- Organisation for Economic Co-operation and Development. (2023). *OECD economic outlook 2023*. <https://www.oecd.org/economic-outlook/>
- United Nations Conference on Trade and Development. (2023). *Trade and development report 2023*. <https://unctad.org/publication/trade-and-development-report-2023>
- United Nations Development Programme. (2024). *Human development report 2023/2024*. <https://hdr.undp.org>
- United Nations Economic Commission for Africa. (2023). *Economic report on Africa 2023*. <https://repository.uneca.org>
- World Bank. (2024). *Global economic prospects*. <https://www.worldbank.org/en/publication/global-economic-prospects>

- World Bank. (2024). *Nigeria development update: Staying the course*.
<https://www.worldbank.org/en/country/nigeria/publication/nigeria-development-update-ndu>
- World Trade Organization. (2024). *Global trade outlook and statistics 2024*.
<https://www.wto.org>