

Exchange Rate Fluctuations and Their Implications for Nigeria's Balance of Payments

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Abstract

This study examined the effect of exchange rate fluctuations on Nigeria's balance of payments from 1980 to 2024. The Augmented Dickey-Fuller (ADF) test showed a mix of I(0) and I(1) variables, leading to the use of the ARDL model. ARDL bound test results indicate a long-run significant relationship among the variables. The result shows that Gross domestic product has a positive and significant effect on the current account balance, while exchange rate, inflation, and oil price show positive but insignificant effects. The study concludes that exchange rate changes alone are not sufficient to improve Nigeria's balance of payments due to structural challenges such as import dependence and reliance on oil exports. We therefore recommend that policies that promote exchange rate stability and export diversification be adopted.

Keywords: Exchange rate, Balance of Payments, ARDL, Nigeria.

INTRODUCTION

The balance of payments provides a comprehensive record of Nigeria's economic transactions with the rest of the world and reflects the country's ability to finance imports, meet external obligations and maintain adequate foreign reserves. Exchange rate movements play a crucial role in shaping these transactions. According to the Marshall Lerner condition, depreciation of a country's currency should theoretically improve the trade balance by making exports cheaper and imports more expensive. However empirical evidence indicates that this expectation does not always hold in practice (Oyinlola & Adeniyi, 2023). In Nigeria's case, structural dependence on imported refined petroleum products, machinery, raw materials and consumer goods means that currency depreciation often increases import costs and may initially worsen the trade balance. In addition persistent exchange rate volatility creates uncertainty, discourages foreign investment and encourages speculative activities in the foreign exchange market. The widening gap between official and parallel market exchange rates further weakens investor confidence and complicates the management of the balance of payments.

Exchange rate refers to the price of a country's currency expressed in terms of another currency and is an important macroeconomic indicator used to assess the overall performance of an economy (Central Bank of Nigeria [CBN], 2021). In an open economy the exchange rate acts as a critical link between domestic economic activities and the global economy influencing trade flows, capital movements and investment decisions. It determines the value of export earnings, the cost of imports and the attractiveness of a country to foreign investors. In Nigeria fluctuations in the exchange rate have become a recurring macroeconomic challenge significantly influencing trade performance, capital inflows and the overall balance of payments. Nigeria's vulnerability to exchange rate instability is largely due to its heavy reliance on crude oil as the primary source of foreign exchange earnings. Changes in global oil prices directly affect foreign exchange inflows, external reserves and the value of the naira. When oil prices decline the country often experiences shortages of foreign exchange, currency depreciation, rising import costs and increased pressure on the balance of payments. Even during periods of high oil prices, stability in the balance of payments remains fragile due to limited export diversification and persistent dependence on imports.

In response to growing macroeconomic distortions and external imbalances, Nigeria shifted from a regulated exchange rate regime to a market oriented framework in September 1986 under the Structural Adjustment Programme (SAP). Prior to this reform Nigeria operated a fixed and adjustable peg exchange rate regime from 1959 to June 1986 during which the naira was first pegged to the British pound and later to the U.S. dollar and a basket of currencies. The SAP reform introduced the Second Tier Foreign Exchange Market (SFEM) in September 1986 marking the beginning of exchange rate liberalization. SFEM operated until July 1987 when it was merged into a unified Foreign Exchange Market (FEM). Subsequent reforms included the introduction of the Autonomous Foreign Exchange Market (AFEM) in 1995 and the Inter Bank Foreign Exchange Market (IFEM) in October 1999. Between 2002 and 2015, the Central Bank of Nigeria implemented

auction based systems such as the Retail Dutch Auction System (RDAS) and the Wholesale Dutch Auction System (WDAS) to improve transparency and price discovery in the foreign exchange market. In June 2016, a managed floating exchange rate regime was introduced allowing greater market determination with periodic intervention by the Central Bank. More recently in June 2023, the foreign exchange market was unified under a “willing buyer, willing seller” framework, consolidating multiple exchange rate windows, including the Investors and Exporters (I&E) window, to enhance liquidity and align the exchange rate with market fundamentals.

Overall Nigeria has experienced five major exchange rate regime phases between 1959 and 2023, transitioning from a fixed peg system (1959–1986) to various forms of market based and managed exchange rate arrangements from 1986 to the present. These reforms reflect ongoing policy efforts to stabilize the naira, correct external imbalances and improve macroeconomic performance (Central Bank of Nigeria, 2023; International Monetary Fund, 2023). Despite these reforms, historical assessments indicate that none of the adopted exchange rate regimes has consistently achieved sustainable exchange rate stability. While the pre-SAP era was characterized by a relatively stable and strong naira under a fixed exchange rate system, the post 1986 period has been marked by persistent depreciation and significant volatility. This continued instability suggests that changes in exchange rate regimes alone are insufficient without complementary macroeconomic policies such as effective demand management, stronger supervision of parallel market activities and enhanced export promotion strategies to ensure stable foreign exchange inflows (Central Bank of Nigeria, 2003). Despite several policy adjustments instability in Nigeria’s foreign exchange market remains a major macroeconomic challenge (CBN, 2023; IMF, 2023).

Frequent depreciation of the naira, wide disparities between official and parallel market exchange rates and recurring foreign exchange shortages continue to disrupt external sector performance (IMF, 2023; World Bank, 2022). Although economic theory suggests that currency depreciation should improve a country’s trade balance under conditions such as the Marshall Lerner criterion, Nigeria’s experience often contradicts this expectation, as import costs rise while export responsiveness remains weak. Furthermore the economy’s heavy reliance on crude oil exports and limited diversification of foreign exchange earnings make the balance of payments highly vulnerable to external shocks (World Bank, 2022; IMF, 2023). As a result fluctuations in the exchange rate have not consistently translated into improvements in external sector stability (CBN, 2023). Recent empirical studies also show that exchange rate instability weakens export performance, increases the cost of imports and discourages both domestic and foreign investment, thereby further worsening the balance of payments. These persistent challenges highlight the need for empirical investigation into the effect of exchange rate fluctuations on Nigeria’s balance of payments.

Hypotheses

H₀: Exchange rate fluctuations have no statistically significant effect on Nigeria’s balance of payments.

LITERATURE REVIEW

Theoretical Framework

The theoretical framework for this study is drawn from international trade and open-economy macroeconomic theories that explain how exchange rate fluctuations affect the balance of payments. This study focuses on the Marshall-Lerner condition, formulated by Marshall (1923) and extended by Lerner (1944) and Davies (1962), and the J-curve effect, which together provide insights into the short- and long-term implications of currency movements for Nigeria's external sector. The Marshall Lerner condition, formulated by Marshall (1923) and extended by Lerner (1944), suggests that a depreciation of a country's currency will improve its trade balance if the sum of the price elasticities of demand for exports and imports exceeds one. In practical terms, a weaker domestic currency makes exports cheaper and imports more expensive, theoretically improving the current account. However, the effectiveness of this mechanism depends on the structure of the economy. In Nigeria, where exports are heavily concentrated in crude oil, which has inelastic demand in the short run, and imports largely consist of essential goods with few domestic substitutes, currency depreciation may not automatically lead to improved external sector performance (Bahmani-Oskooee & Ratha, 2004; Rose, 1991).

The J-Curve effect complements this perspective by illustrating the temporal response of the trade balance to currency depreciation. Initially, depreciation can worsen the trade balance due to higher import costs and rigidities in trade contracts. Over time, however, exports gradually respond to improved competitiveness and import demand adjusts, eventually enhancing the current account and overall balance of payments (Krugman & Obstfeld, 2009; Bahmani-Oskooee & Brooks, 1999). Evidence from developing countries, including Nigeria, suggests that short-term depreciation often exacerbates trade deficits before the anticipated improvement occurs. Together, these two theories provide a coherent lens for examining Nigeria's external sector. While the Marshall-Lerner condition explains the mechanical relationship between exchange rates and trade flows, the J-Curve highlights the short-run versus long-run dynamics, clarifying why depreciation may not immediately translate into balance of payments improvement. These theories form the foundation for analyzing how exchange rate fluctuations transmit their effects through trade performance, capital flows, and foreign reserves to influence Nigeria's overall external sector stability.

Empirical Review

Nigerian Evidence

The empirical landscape in Nigeria regarding exchange rate fluctuations and external sector performance is dominated by a recurring paradox: the failure of theoretical currency depreciation to translate into improved trade balances. While standard Marshall-Lerner conditions suggest that a weaker Naira should stimulate exports, Nigeria's structural rigidities, primarily its mono-product nature, often neutralize these benefits. Early analysis by Adeniran, Yusuf, and Adeyemi (2014) utilized a static OLS framework to show that depreciation did not significantly improve the trade balance. Their findings pointed toward an ingrained structural import dependence that makes the Nigerian economy inelastic to price changes. This was later supported by Ibrahim and Lawal (2020), who used an ARDL model to demonstrate that even when the Naira is devalued, export volumes remain sluggish. They argued that because crude oil, priced in USD and determined by global demand, makes up the bulk of Nigeria's foreign earnings, domestic currency adjustments have little to no impact on export revenue. Both studies converge on the reality that without a diversified productive base, currency manipulation remains a blunt tool.

The discussion moved toward long-term dynamics with Oladipupo and Onotaniyohuwo (2016), who employed a VECM approach. They confirmed a long-run equilibrium between the exchange rate and the Balance of Payments (BOP) but warned that the noise of persistent volatility serves as a deterrent to long-term trade planning. More recently, Anokwuru and Chidinma (2024) utilized ARDL bounds testing to capture these relationships in the short and long run, reinforcing the idea that the external position is highly sensitive to the shocks seen in Nigeria's fragmented foreign exchange market. Beyond mere trade flows, the literature also addresses the cost of misalignment. Eze and Okpala (2022) found that when the official rate deviates too far from economic realities, it creates a competitiveness gap that contributes to chronic BOP instability. Their work suggests that stability is not just about the value of the Naira, but the predictability of the exchange rate regime itself.

Collectively, the Nigerian evidence suggests a Structuralist view: exchange rate policy does not operate in a vacuum. The recurring theme across Irmiya et al. (2023) and Anthony et al. (2024) is that as long as Nigeria remains an oil-dependent, import-heavy economy, depreciation will likely fuel inflation via the pass-through effect rather than fixing the balance of payments. Thus, the literature increasingly calls for a policy mix that pairs exchange rate management with aggressive industrial diversification.

Evidence from Other Countries

The global discourse on exchange rate dynamics has shifted toward a more integrated view of how currency volatility filters through to the balance of payments (BOP). International empirical evidence consistently suggests that the effectiveness of exchange rate adjustments is not universal but is instead contingent upon a nation's specific structural and commodity dependencies. A primary

example is found in the work of Dekkiche et al. (2022), who applied an ARDL model to the Algerian economy, a context that closely mirrors Nigeria's oil dependency. Their findings established that exchange rate instability is a decisive factor in long-term external sustainability, particularly when the economy is tethered to a single volatile commodity. This theme of regional sensitivity is echoed by Masoom et al. (2025) in their analysis of SAARC countries. By utilizing panel econometrics, they demonstrated that depreciation does not have a uniform impact; rather, its success in correcting a current account deficit is dictated by a country's specific trade composition and underlying macroeconomic stability.

The complexity of these relationships is further clarified by looking at broader macroeconomic interactions. Malec et al. (2024) explored the triple threat of inflation, exchange rate volatility, and growth in Ethiopia. Their results highlight that currency movements do not operate in a vacuum; they are inextricably linked to domestic price stability. This pass-through effect is a critical consideration for external sector stability, as inflation can quickly erode the competitive gains intended by a currency depreciation. Adding a layer of technical sophistication, Olayungbo and Hassan (2023) moved beyond linear assumptions to investigate asymmetric pass-through effects. Using a nonlinear ARDL (NARDL) framework, they proved that oil price shocks and exchange rate shifts do not hit the economy with the same intensity in both directions. For open, resource-dependent economies, this asymmetry means that the pain of a price drop or currency crash often outweighs the gain of an equivalent recovery.

In summary, the international literature underscores a vital consensus: modeling the external sector requires more than just a focus on trade volumes. It necessitates a comprehensive approach that accounts for the interaction between inflation, output, and commodity price shocks. For a resource-dependent nation like Nigeria, these global findings reinforce the need for dynamic, integrated modeling to capture the true long-run equilibrium of the balance of payments.

Literature Gap

The conceptual framework of this study explains how exchange rate fluctuations influence Nigeria's balance of payments through trade and capital flow channels. Drawing from the Marshall–Lerner condition and the J-Curve theory, exchange rate depreciation is expected to affect export performance, import demand, and overall external sector stability (Bahmani-Oskooee & Ratha, 2004; Krugman & Obstfeld, 2009). In this study, the balance of payments, measured by the real effective exchange rate, is the dependent variable, while exchange rate fluctuations serve as the independent variable. Changes in the exchange rate affect the trade balance by altering the relative prices of exports and imports. In the short run, depreciation may worsen the trade balance due to higher import costs, according to the J-Curve effect. However, in the long run, improved export competitiveness may strengthen the trade balance and enhance the overall BOP position if the

Marshall-Lerner condition holds. Additionally, exchange rate movements influence capital flows and foreign reserves, which are key components of the balance of payments. However, Nigeria's structural characteristics, such as heavy reliance on oil exports and high import dependence, may weaken the expected positive effects of depreciation on external stability.

Therefore, the framework assumes that exchange rate fluctuations transmit their effects through trade and capital channels to determine Nigeria's overall balance of payments position.

METHODOLOGY

To examine the effects of exchange rate fluctuations and Nigeria's balance of payments, a quantitative time-series econometric design has been adopted. Spanning from 1980 to 2024, it provides a robust dataset for capturing the volatility of the Naira. Data sources include the Central Bank of Nigeria Statistical Bulletin and World Bank World Development Indicators (WDI). The current account balance measures the balance of payments, while the real effective exchange rate measures the exchange rate. Control variables are the inflation rate, gross domestic product, and oil price. Because this study observes historical data as it happened, it follows a non-experimental approach, prioritizing the analysis of real-world fluctuations over controlled variables. The Autoregressive Distributed Lag (ARDL) technique using EViews 12 software was employed because the Augmented Dickey-Fuller unit root test revealed a mixture of I (0) and I (1) variables. This technique is appropriate for estimating both short-run dynamics and long-run equilibrium relationships among the variables.

Model Specification

The functional relationship for the study is specified as:

$$CAB = f(REXR, INF, GDP, OILP)$$

The econometric form of the model is expressed as:

$$CAB = \beta_0 + \beta_1 REXR + \beta_2 INF + \beta_3 GDP + \beta_4 OILP + \varepsilon$$

Where:

CAB= Current Account Balance

REXR =Real Effective Exchange Rate

INF = Inflation Rate

GDP = Gross Domestic Product

OILP = Oil Price

β_0 = Intercept term

β_1 – β_4 = Slope coefficients of the explanatory variables

ε = Error term capturing other omitted factors affecting BOP

DATA ANALYSIS AND RESULTS

Table 1: Summary of descriptive statistics

	CAB	REXR	INF	GDP	OILP
Mean	2.729282	147.6383	21.63160	2.966677	17.04637
Median	1.317887	101.4473	12.41966	4.062364	12.12022
Maximum	20.79404	536.8968	219.0028	15.32916	104.6200
Minimum	-5.100383	49.77484	0.686099	-13.12788	1.573876
Std. Dev.	5.259630	113.2420	33.55448	5.292604	20.87663
Skewness	1.307545	1.912250	4.772377	-0.852911	3.072006
Kurtosis	4.984336	6.005221	28.03769	4.659840	11.86585
Jarque-Bera	20.20554	44.35903	1346.228	10.62168	218.1605
Probability	0.000041	0.000000	0.000000	0.004938	0.000000
Sum	122.8177	6643.724	973.4221	133.5005	767.0868
Sum Sq. Dev.	1217.203	564244.9	49539.75	1232.513	19176.69
Observations	45	45	45	45	45

Source: Author's computation from E-views 12 output (2026)

Correlation Matrix

In this section, the effect among the variables on interest are examined. The results from the correlation matrix are presented bellow;

Table 2: Results of Correlation Matrix

	CAB	REXR	INF	GDP	OILP
CAB	1.000000	-0.321115	-0.217828	0.576637	0.132944
REXR	-0.321115	1.000000	0.126837	-0.445534	-0.188112
INF	-0.217828	0.126837	1.000000	-0.484521	-0.088996
GDP	0.576637	-0.445534	-0.484521	1.000000	0.157965
OILP	0.132944	-0.188112	-0.088996	0.157965	1.000000

Source: Author's computation from E-views 12 output (2026)

Results in Table 2 show the correlation coefficients between the variables. The results indicate a moderate positive relationship of 0.576637 between Current Account Balance (CAB) and Gross Domestic Product (GDP), suggesting that as the economy grows, the current account balance tends to improve. Furthermore, there is a moderate negative correlation of -0.484521 between Gross Domestic Product (GDP) and Inflation (INF), which implies that higher inflation is associated with lower economic growth within this specific dataset. There is also a negative correlation of -0.32115 between the real effective exchange rate index (REXR) and the current account balance, indicating that as the real exchange rate increases, the Current Account Balance (CAB) tends to decrease. Most importantly, all correlation coefficients are below the commonly used threshold of 0.80. This

suggests that there is no multicollinearity among the independent variables, which supports the reliability of subsequent regression analysis.

Stationary Tests

Table 3: The Augmented Dickey Fuller Test Result

ADF					
AT LEVELS			AT FIRST DIFFERENCE		
Variables	ADF statistics (At Levels)	5% Critical value	ADF statistics (1 st Difference)	5% Critical value	Order of Integration
CAB	-3.041227	-2.929734	–	–	Stationary I (0)
REXR	-1.990883	-2.929734	-4.554495	-2.931404	Stationary I (1)
INF	-6.272666	-2.929734	–	–	Stationary I (0)
GDP	-2.967034	-2.931404	–	–	Stationary I (0)
OILP	-1.893431	-2.929734	-7.626302	-2.931404	Stationary I (1)

Source: Author's computation from E-views 12 output (2026)

The result from Table 3 shows that current account balance (CAB), inflation rate (INF), and gross domestic product (GDP) are stationary at levels, while real effective exchange rate and oil price are stationary at the first difference. This shows that the variables had mixed order of integration.

Optimal Lag Order

The Vector Autoregressive (VAR) analysis was used to determine the optimal lag, as seen in Table 4. Using the Akaike Information Criteria, lag order 3 was selected for the model.

Table 4: Optimal Lag Order result

VAR Lag Order Selection Criteria
Endogenous variables: CAB GDP INF OILP REXR
Exogenous variables: C
Date: 02/24/26 Time: 21:05
Sample: 1980 2024
Included observations: 42

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-854.8776	NA	4.17e+11	40.94655	41.15342	41.02238
1	-791.1791	109.1974	6.68e+10	39.10377	40.34496*	39.55871*
2	-761.4754	43.84827*	5.62e+10*	38.87978	41.15530	39.71385
3	-735.2338	32.48961	6.10e+10	38.82066*	42.13051	40.03385

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's computation from E-views 12 output (2026)

Table 5: ARDL Bounds Test

Test Statistics	Value	K
F-statistic	4.219470	4
CRITICAL VALUE BOUNDS		
Significance	I (0) Bound	I (1) Bound
10%	2.402	3.345
5%	2.85	3.905
1%	3.892	5.173

Source: Author's computation from E-views 12 output (2026)

Note: 10%, 5%, and 1%, represents level of significance

Hypothesis

Null Hypothesis (H_0): No long-run relationship exists between Current Account Balance (CAB) and the independent variables (REXR, INF, GDP, OILP).

The result from the bound test shows that the f-statistic value is greater than the upper bound value. This implies that the null hypothesis was rejected. Thus, there is a significant long-run relationship between the real effective exchange rate, inflation rate, gross domestic product, oil price, and current account balance.

Table 6: ARDL REGRESSION ANALYSIS

SHORT RUN MODEL				
VARIABLE	COEFFICIENT	STANDARD ERROR	T-STATISTICS	PROBABILITY
D (CAB (-1))	0.401541	0.145599	2.757847	0.0095
D (CAB (-2))	-0.197352	0.130291	-1.514702	0.1397
D (GDP)	0.273393	0.138368	1.975841	0.0568
D (GDP (-1))	-0.589149	0.155890	-3.855664	0.0009
CointEq (-1)*	-0.488167	0.142801	-3.418518	0.0017
LONG RUN MODEL				
REXR	0.027324	0.018071	1.512063	0.1403
INF	0.045431	0.073236	0.620338	0.5394
GDP	1.246114	0.426156	2.924080	0.0063
OILP	0.090180	0.062654	1.439003	0.1599
C	-6.807483	4.922040	-1.383061	0.1762

Source: Author's computation from E-views 12 output (2026)

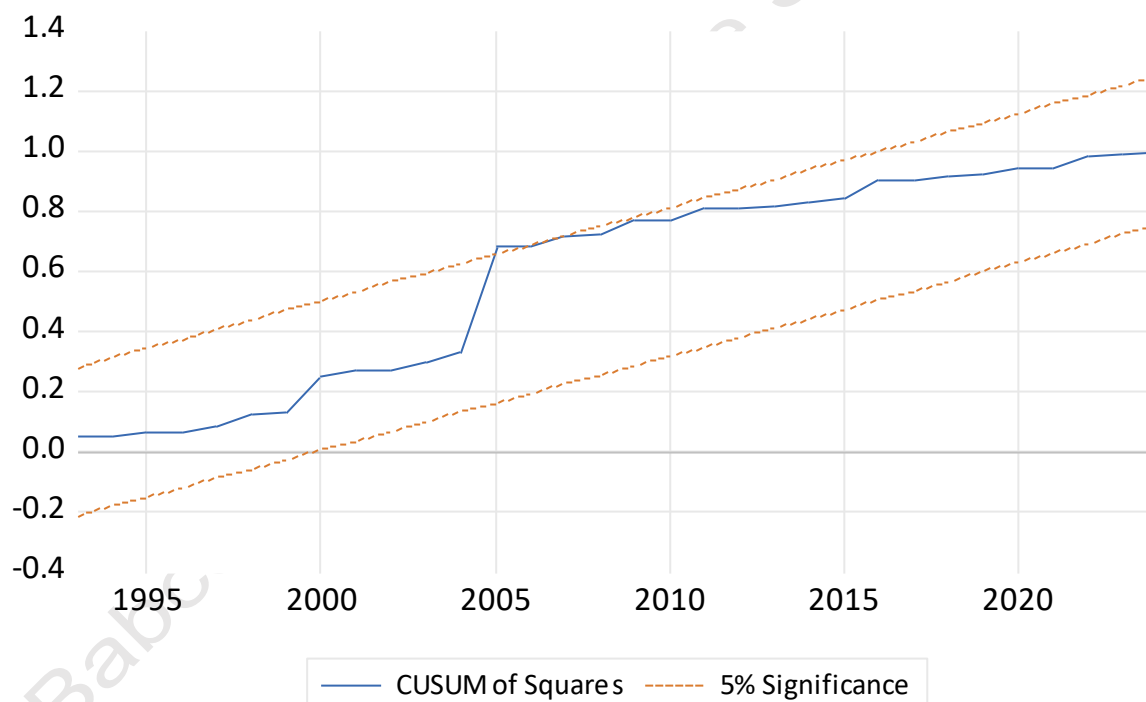
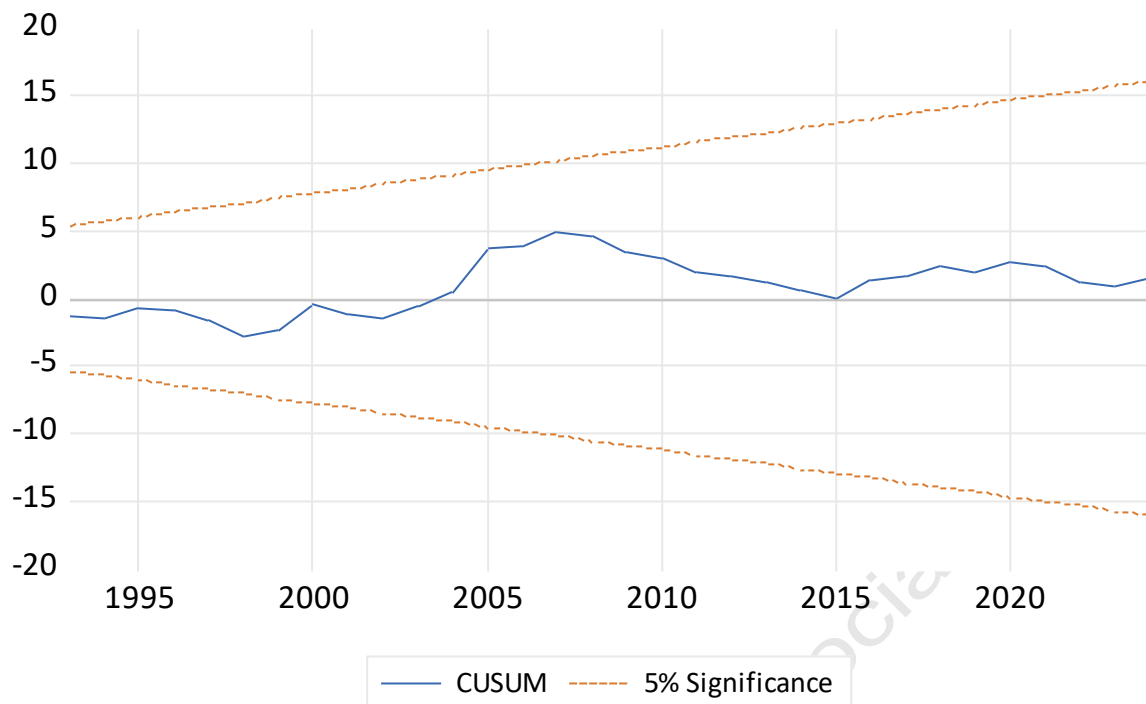
Table 7: Residual Diagnostic Test Results

Breusch – Godfrey Serial Correlation LM Test			
F-statistic	0.558220	Prob. F(2,30)	0.5781
Obs*R-squared	1.506937	Prob. Chi-Square(2)	0.4707
Breusch-Pagan-Godfrey Heteroskedasticity Test			
F-statistic	0.046131	Prob. F(1,39)	0.8311
Obs*R-squared	0.048440	Prob. Chi-Square(1)	0.8258
Histogram -Normality Test			
Jarque-Bera	11.89235	Probability	0.002616

Source: Author's computation from E-views 12 output (2026)

Although residuals are not normally distributed, the large sample size reduces the impact of non-normality due to the Central Limit Theorem.

STABILITY TEST



Discussion

From Table 6, the lagged error correction term (CointEq(-1)) was negative and statistically significant (-0.488167, $p < 0.05$), confirming the presence of long-run equilibrium and indicating that approximately 48% of short-run disequilibrium is corrected annually. This relatively high speed of adjustment suggests that deviations from long-run equilibrium do not persist indefinitely. However, in the long-run model, only GDP was statistically significant ($p = 0.0063$), indicating that economic growth plays a dominant role in determining Nigeria's external balance. Real Effective Exchange Rate (REXR), Inflation (INF), and Oil Price (OILP) were not statistically significant in the long run, despite having positive coefficients. This finding is particularly revealing.

The insignificance of exchange rate in the long run challenges the traditional Marshall Lerner expectation that currency depreciation improves the trade balance. In line with studies such as Bahmani Oskooee & Ratha (2004) and Rose (1991), the result suggests that depreciation may not automatically improve the external sector if export and import demand elasticities are weak. For Nigeria, the structural dependence on crude oil exports priced in US dollars and heavy import reliance reduce the effectiveness of exchange rate adjustments as a corrective tool. Furthermore, although oil price had a positive coefficient, its lack of statistical significance implies that oil price movements alone may not guarantee balance of payments stability. This aligns with Nigeria's experience documented by the International Monetary Fund (2023) and the World Bank (2022) which highlight structural weaknesses, limited export diversification, and foreign exchange market distortions as persistent challenges. Overall, the findings support a structuralist interpretation; exchange rate policy alone cannot correct Nigeria's balance of payments imbalance without complementary reforms in production, export diversification, and macroeconomic management.

CONCLUSION AND RECOMMENDATIONS

This study investigated the implications of exchange rate fluctuations on Nigeria's balance of payments within an ARDL framework. The results show that while there is evidence of a long-run relationship among the variables, exchange rate fluctuations do not exert a statistically significant long-run effect on the current account balance. Instead, economic growth emerges as the most significant determinant of external balance. The findings imply that currency depreciation in isolation is insufficient to improve Nigeria's balance of payments. Structural rigidities such as oil dependence, import-intensive consumption patterns, and weak industrial capacity limit the effectiveness of exchange rate adjustments. Therefore, policy efforts should move beyond exchange rate management towards;

1. Export diversification beyond crude oil.

2. Strengthening domestic industrial production.
3. Reducing import dependence.
4. Ensuring exchange rate stability and transparency.
5. Promoting macroeconomic coordination between monetary and fiscal authorities.

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