Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of
Asian Economic Light (JAEL) – Peer Reviewed Journal
SJIF Impact Factor (2026): 8.835 Volume: 14 | Issue: 3 | March 2026

EXCHANGE RATE AND IMPORTS IN NIGERIA

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ABSTRACT

This research is examined the effect of exchange rate on imports in Nigeria from 1990 to 2023. The Autoregressive Distributed Lag (ARDL) co-integration technique was adopted in line with the theoretical relationship between the concepts (exchange rate, imports, inflation, and real GDP) as established by some theories in international economics. The empirical evaluation of the relationship between the key concepts commenced systematically. It comprised pre-estimation tests (unit root test), and then from the result of the ARDL bound test the study discovered traces of co-integration or long-run relationship. That means there was a presence of both long-run relationship between imports and the independent variables (exchange rate, inflation, and real GDP). Thus, ARDL-ECM regression analysis was adopted, and then some diagnostics or postestimation tests were carried out. From the Augmented Dickey-Fuller (ADF) test, the variables were either stationary at level or first difference. The Granger causality test showcased a unidirectional causality between exchange rate and imports in Nigeria. The first objective of the study was to examine the effect of exchange rate on imports in Nigeria. Based on empirical and theoretical literature, the effect of exchange rate on imports in Nigeria should be significant. The study adopted the ARDL framework for its empirical analysis. The result of the ARDL showed that exchange rate has a significant effect on imports in Nigeria in both the short run and the long run. The second objective was to assess the long-run effect of exchange rate on imports in Nigeria. The findings revealed that exchange rate has a strong long-run impact on imports, showing that persistent fluctuations in exchange rate significantly influence the volume of imported goods in Nigeria. The third objective was to determine the nature of causality between exchange rate and imports in Nigeria. The study used the pairwise Granger causality technique to achieve this objective. The findings of the study revealed that there exists a uni-directional causality flowing from exchange rate to imports in Nigeria.

INTRODUCTION

Trade has long been recognized as a fundamental engine of global economic growth, fostering interdependence among nations and enabling them to benefit from comparative advantages. Among the two main components of trade—exports and imports—importation plays a particularly strategic role for developing countries. Through imports, nations acquire essential goods, services, technology, and capital equipment that may not be sufficiently produced locally. However, the cost and quantity of these imports are critically influenced by the exchange rate— the price of one country's currency relative to another's (Krugman, Obstfeld, & Melitz, 2018). Globally, exchange rate movements are a major determinant of the direction and magnitude of trade flows. A depreciation of the local currency generally increases the domestic cost of imported goods, thereby reducing import demand, while appreciation lowers the cost of imports and may lead to a surge in foreign goods (World Bank, 2020). Hence, the stability and predictability of the exchange rate are vital not just for trade but for broader macroeconomic management, affecting inflation, employment, investment decisions, and living standards. In recent years, countries around the world have faced heightened currency volatility due to global shocks such as oil price fluctuations, trade wars, the COVID-19 pandemic, and geopolitical tensions—highlighting the sensitivity of trade flows to currency dynamics.

In Africa, the situation is further complicated by structural weaknesses. Many African countries are characterized by low levels of industrialization, dependence on a narrow range of exports (mainly primary

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commodities), and high dependence on imported consumer goods and production inputs (United Nation Economic Commission for Africa, 2019). Because these countries rely on foreign exchange earned from a few export commodities to finance their large import bills, any external shock such as a fall in global commodity prices can trigger foreign exchange shortages, currency depreciation, and trade instability. Exchange rate volatility, in turn, worsens macroeconomic instability, raises inflation, and increases the cost of debt servicing, especially for countries with large external debt obligations (International Monetary Fund, 2022).

Nigeria, the largest economy in Africa by GDP and population, presents a classical example of the challenges posed by the interaction between imports and exchange rate dynamics. Despite its oil wealth and vast human and natural resources, Nigeria remains a largely import-dependent economy. A significant proportion of goods consumed or used for production—including food, fuel, pharmaceuticals, electronics, vehicles, textiles, and machinery—are imported. This import dependence exists largely due to underdeveloped local industries, low productivity, infrastructural deficits, and technological gaps (Central Bank of Nigeria, 2023). At the heart of Nigeria‘s foreign exchange system is its overdependence on crude oil exports, which account for more than 90% of foreign exchange earnings and about 70% of government revenue. This monoproduct export structure exposes the economy to external price shocks and makes foreign exchange availability highly volatile. Consequently, any decline in global oil prices or production volumes often leads to forex shortages, naira depreciation, and rising import costs. For example, the oil price shocks of 2014–2016 and 2020 significantly affected the naira's value, leading to sharp currency depreciation and a surge in inflation, especially for imported goods (Iyoha & Oriakhi, 2021). In response, the Central Bank of Nigeria (CBN) has adopted several exchange rate regimes over time—ranging from fixed to managed float, dual/multiple exchange rates, and recently a move towards unification of the exchange rate. Despite these efforts, the foreign exchange market in Nigeria remains fragmented, inefficient, and frequently distorted. High demand for forex, low supply, and limited transparency have resulted in significant differentials between official and parallel market rates, encouraging speculation, rent-seeking, and hoarding (Adebiyi & Adeniran, 2022).

The CBN has also implemented various administrative and monetary measures aimed at controlling imports and conserving foreign exchange. These include the 2015 policy banning access to forex for 41 (later expanded to 43) imported items considered non-essential, the promotion of import substitution, and the introduction of the Importers and Exporters (I&E) forex window to enhance price discovery and improve allocation efficiency. While these measures were designed to reduce import pressure and protect the naira, their effectiveness has been mixed. In some cases, they resulted in shortages, price hikes, smuggling, and business closures due to lack of access to inputs (Okonkwo & Ezeabasili, 2020). Additionally, the widening gap between official and black-market exchange rates has created multiple pricing systems, discouraged investment, and weakened confidence in monetary policy. Importers, faced with difficulties accessing forex from official sources, often resort to the parallel market at significantly higher rates, which further fuels inflation and erodes purchasing power. These challenges are further exacerbated by Nigeria's high inflation rate, insecurity, low non-oil export capacity, and fiscal imbalances—all of which complicate exchange rate management and the sustainability of the import sector (National Bureau of statistics, 2023).

The impact of exchange rate fluctuations on Nigeria‘s import sector is multidimensional. For one, depreciation of the naira leads to higher import prices, which directly affects business costs and consumer prices. For industries that rely heavily on imported raw materials and machinery, this often results in higher production costs, reduced profitability, or outright shutdowns. Moreover, in a context where the government also depends on imports (e.g., for infrastructure and defence), currency depreciation increases the cost of capital projects and deepens fiscal pressure. Consumers, on the other hand, are hit by rising prices of imported goods, reduced access to essential items, and deteriorating living standards.

In principle, a depreciation of the exchange rate is expected to boost exports and stimulate domestic production by encouraging import substitution. In Nigeria, however, this expected outcome has largely failed to materialize. Persistent structural constraints—including unreliable electricity supply, deteriorating infrastructure, widespread insecurity, high production costs, and frequent policy reversals—have weakened the productive capacity of the economy. Consequently, rather than fostering resilience, the relationship between imports and exchange rate movements in Nigeria continues to reflect fragility, reinforcing a self-perpetuating cycle of foreign exchange shortages, naira depreciation, rising inflation, and persistent trade imbalances (Iyoha

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& Oriakhi, 2021). Against this backdrop, a comprehensive analysis of how exchange rate fluctuations affect imports in Nigeria is both timely and necessary. Such a study can help quantify the sensitivity of import demand to exchange rate movements, expose underlying structural deficiencies within the trade and monetary systems, and provide empirical evidence to support sound policy formulation. Ultimately, this analysis is crucial for promoting macroeconomic stability, reducing vulnerability to external shocks, and advancing a more resilient and self-sustaining economy.

In an increasingly globalized world, exchange rates play a critical role in shaping a country's trade dynamics, particularly with respect to imports and exports. For an import-dependent economy such as Nigeria, exchange rate fluctuations have profound implications—not only for the cost and availability of foreign goods but also for overall economic stability and long-term development. Over the years, Nigeria has relied heavily on imports to satisfy domestic demand for consumer goods, industrial machinery, agricultural inputs, pharmaceuticals, refined petroleum products, and other essential items. This dependence, however, is not supported by stable and diversified foreign exchange earnings. Instead, Nigeria's export structure remains highly concentrated, with crude oil accounting for the overwhelming majority of foreign exchange receipts. This lack of diversification exposes the economy to external shocks and volatility in global commodity prices (CBN, 2023; Iyoha & Oriakhi, 2021).

Given that crude oil generates over 90 percent of Nigeria's foreign exchange earnings, any decline in oil prices or production levels significantly reduces foreign reserves and places substantial pressure on the naira. This pattern has been evident during major global oil price downturns—such as those experienced in 2008–2009, 2014–2016, and 2020—when Nigeria faced acute exchange rate instability and sharp currency depreciations. During such periods, naira depreciation raises the cost of imports, fuels inflation, weakens consumer purchasing power, and increases operational costs for firms that depend on imported inputs. As a result, exchange rate volatility transcends monetary policy concerns and becomes a broader economic challenge, with far-reaching consequences for trade, investment, employment, and household welfare (Adebiyi & Adeniran, 2022; Okonkwo & Ezeabasili, 2020).

Although the Central Bank of Nigeria (CBN) has introduced several measures to stabilize the exchange rate and curb import dependence—such as foreign exchange restrictions, managed float regimes, the Investors' and Exporters' (I&E) window, and recent efforts toward exchange rate unification—these policies have produced limited and inconsistent outcomes. The foreign exchange market remains characterized by inefficiencies, chronic shortages at official windows, widening disparities between official and parallel market rates, and persistent speculative activities. Consequently, many importers are unable to access foreign exchange through official channels and are compelled to rely on the parallel market at significantly higher rates. These elevated costs are ultimately passed on to consumers, contributing to rising prices, inflationary pressures, and a weakening of monetary policy effectiveness, while eroding real incomes and savings (NBS, 2023; IMF, 2022). Moreover, the theoretical assumption that exchange rate depreciation should discourage imports and stimulate domestic production has not held true in Nigeria due to deep-seated structural weaknesses. Inadequate infrastructure, erratic power supply, insecurity, policy inconsistency, and a fragile manufacturing base have undermined local productive capacity. As a result, import substitution initiatives have achieved limited success, and the country continues to import goods that could potentially be produced domestically. This situation perpetuates a vicious cycle of foreign exchange scarcity, currency depreciation, import-driven inflation, and macroeconomic instability.

Despite the importance of this issue, empirical evidence on the precise relationship between exchange rate fluctuations and import performance in Nigeria remains limited. While it is widely recognized that exchange rate movements influence import behavior, the magnitude, direction, and transmission mechanisms of this influence have not been adequately examined using recent data and robust analytical methods. This gap in the literature constrains evidence-based policymaking and leaves the economy exposed to repetitive policy responses that fail to address fundamental structural challenges. Accordingly, this study focuses on the persistent volatility of Nigeria's exchange rate and its adverse effects on the country's import structure and overall economic performance. Specifically, the study seeks to determine how exchange rate changes affect the volume, cost, and composition of imports in Nigeria, and to draw implications for trade policy, exchange rate management, and broader economic planning. The main objective of the study is to examine the relationship

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International Journal of
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between exchange rate fluctuations and import demand in Nigeria. The specific objectives are to: (i) assess the effect of exchange rate movements on imports in Nigeria; (ii) evaluate the long-run impact of exchange rate changes on import demand; and (iii) determine the direction of causality between exchange rate fluctuations and imports in Nigeria.

LITERATURE REVIEW

The exchange rate represents the value at which one nation's currency is exchanged for another and occupies a central position in international economic analysis. Its significance stems from its influence on the relative prices of domestic and foreign goods, services, and financial assets. Movements in exchange rates affect not only import and export volumes but also capital flows, inflationary trends, and overall macroeconomic stability. As noted by Krugman, Obstfeld, and Melitz (2018), exchange rate dynamics shape international competitiveness and resource allocation, thereby directly influencing trade outcomes. Dornbusch's (1976) overshooting hypothesis further explains that because asset prices adjust faster than goods prices in open economies, exchange rates may fluctuate sharply in the short run, generating volatility that affects trade decisions. Mussa (1986) reinforces this view by arguing that even under floating regimes, real exchange rates remain unstable due to speculative behavior and shifting expectations. In a similar vein, MacDonald (1995), through the Behavioural Equilibrium Exchange Rate (BEER) approach, highlights the role of economic fundamentals—such as productivity differentials and interest rate gaps—in explaining persistent deviations of exchange rates from their equilibrium values.

In Nigeria, sustained depreciation of the naira has emerged as a major policy challenge. According to Iyoha and Oriakhi (2021), weak export performance and recurring external shocks have intensified pressure on the currency, leading to rising import costs, accelerating inflation, and persistent shortages of foreign exchange. Consequently, exchange rate management has become a focal point in Nigeria's macroeconomic policy debates. Closely linked to this issue is exchange rate volatility, which refers to the extent and frequency of fluctuations in currency values over time. Elevated volatility increases uncertainty in cross-border transactions, discouraging trade and investment. Engle's (1982) development of the Autoregressive Conditional Heteroskedasticity (ARCH) framework provided a foundation for measuring time-varying volatility in economic series, including exchange rates. Clark et al. (2004) argue that excessive volatility heightens pricing risk, increases transaction costs, and weakens long-term trade relationships. Evidence from Nigeria supports these conclusions. Adeoye and Atanda (2012) find that fluctuations in the naira–dollar exchange rate significantly influence inflation, foreign direct investment, and the trade balance. Asteriou and Hall (2007) further observe that developing economies with narrow export bases—such as Nigeria's heavy reliance on crude oil—are particularly exposed to exchange rate shocks. Fapetu and Oloyede (2014) attribute Nigeria's exchange rate instability to volatile oil prices, speculative demand for foreign exchange, and inconsistent policy actions, all of which translate into unstable import costs and heightened business risk.

Imports play a critical role in the Nigerian economy, given the country's heavy dependence on foreign goods and services. Imports comprise goods and services acquired from other countries for domestic use, including consumer products, capital equipment, and intermediate inputs. While imports enable access to goods that are inefficient or impossible to produce locally, excessive reliance can result in balance-of-payments pressures and foreign exchange constraints. Babatunde and Egwaikhide (2009) identify income levels, relative prices, and exchange rate movements as key determinants of import demand in Nigeria. Adeniran and Sidiq (2018) argue that Nigeria's import dependence is largely structural, arising from weak industrial capacity, inadequate infrastructure, and technological limitations. Akpan and Atan (2015) note that repeated episodes of naira depreciation have failed to curb import volumes because many imported goods—such as petroleum products, pharmaceuticals, and staple foods—are necessities with low price elasticity. Frankel and Romer (1999) caution that although trade openness can promote growth through increased imports and technology diffusion, excessive openness without productive capacity may deepen external dependence. Similarly, UNCTAD (2020) attributes Nigeria's high import intensity, even for basic commodities, to a fragile manufacturing sector constrained by unreliable power supply, insecurity, and limited access to finance.

Import demand refers to the willingness and capacity of domestic economic agents to purchase goods and services from abroad. It is influenced by income, relative prices, exchange rate movements, and the availability of domestic substitutes. Goldstein and Khan (1985) developed a conventional import demand framework in

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which income and relative prices—including exchange rate effects—are the primary determinants. Applying this framework to Nigeria, Babatunde and Egwaikhide (2009) establish a long-run relationship between import demand, income growth, and exchange rate changes. Olabisi and Sawyer (2020) find that Nigeria exhibits high income elasticity but low price elasticity of import demand, suggesting a persistent preference for imported goods even during periods of currency depreciation. Emeka and Emodi (2017) similarly observe that naira depreciation has only a marginal effect on reducing import volumes because demand for essential goods such as fuel, rice, and medicines is largely inelastic. UNECA (2019) argues that deep-rooted structural rigidities across many African economies, including Nigeria, limit effective import substitution and weaken the ability of exchange rate policy to regulate import demand.

Exchange rate regimes define the institutional arrangements through which countries manage their currencies relative to others. These arrangements—ranging from fixed to floating and managed float systems—determine the degree of market influence and central bank intervention in exchange rate determination. Mundell's (1961) policy trilemma demonstrates that it is impossible for a country to simultaneously maintain a fixed exchange rate, unrestricted capital mobility, and independent monetary policy. Reinhart and Rogoff (2004) show that official exchange rate classifications often differ from actual practices, particularly in developing economies. Calvo and Reinhart (2002) introduce the concept of "fear of floating" to describe countries that officially adopt floating regimes but frequently intervene to stabilize their currencies. Nigeria's exchange rate system has evolved from a fixed regime to a managed float, characterized by multiple exchange rate windows and discretionary allocation of foreign exchange. Adebiyi and Adeniran (2022) argue that this system has created distortions, encouraged arbitrage, and undermined market efficiency, while Oyejide (2001) contends that policy inconsistency and lack of transparency have weakened investor confidence and macroeconomic stability. A clear understanding of exchange rate concepts, import behavior, and regime choices is therefore essential for analyzing Nigeria's trade dynamics.

The Marshall–Lerner Condition, originally proposed by Joan Robinson in 1947, provides a key theoretical framework for understanding how exchange rate depreciation affects a country's trade balance. The condition states that depreciation will improve the trade balance only if the combined absolute price elasticities of import and export demand exceed one. The theory assumes that changes in exchange rates alter relative prices, discouraging imports while stimulating exports. Krugman and Obstfeld (2009) describe the Marshall–Lerner Condition as central to balance-of-payments adjustment under flexible exchange rate regimes.

In practice, however, the applicability of the Marshall–Lerner Condition in developing economies such as Nigeria is constrained. A major limitation is the assumption that import and export demand are sufficiently price-responsive. In Nigeria, many imports—such as fuel, food, machinery, and pharmaceuticals—are essential goods with low elasticity. Empirical studies by Egwaikhide (1999) and Akpan and Atan (2015) confirm that Nigeria's import demand responds weakly to price changes, particularly in the short run. Furthermore, the theory assumes a stable macroeconomic environment and competitive export sectors, conditions that are often absent due to infrastructural deficits, insecurity, and high production costs. As a result, currency depreciation frequently leads to imported inflation rather than improved trade performance. Olayungbo and Akinlo (2017) find that naira depreciation in Nigeria tends to intensify inflationary pressures without producing significant gains in the trade balance. Additionally, adjustment delays in trade flows, as explained by the J-Curve theory, imply that short-run effects of depreciation may be adverse before any long-run improvement materializes.

Despite these limitations, the Marshall–Lerner framework remains highly relevant for empirical analysis. This study adopts the theory as its primary analytical foundation because it directly links exchange rate movements to import demand behavior. By examining Nigeria's experience between 1990 and 2023, the study assesses whether exchange rate depreciation has meaningfully reduced import volumes and evaluates whether the elasticity conditions required for trade balance improvement are satisfied in both the short and long run.

Ibrahim and Dauda (2023) investigated Nigeria's import demand under a dual exchange rate framework, analyzing both official and parallel market rates from 2000 to 2022. Their ARDL-based results indicate that the parallel market exerts a stronger influence on informal trade, reflecting high currency speculation and arbitrage activity. While the study's use of dual-rate data enhances its real-world relevance, the difficulty of quantifying informal trade and the lack of official validation somewhat limit the precision of the findings.

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of

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SJIF Impact Factor (2026): 8.835 Volume: 14 | Issue: 3 | March 2026

Mohammed and Lawal (2023) focused on consumer goods imports in Nigeria over the same period, employing an ARDL model. They found that import volumes were largely insensitive to exchange rate changes in the short term but adjusted slightly over the long run. The study benefits from its up-to-date quarterly data, yet it omits other macroeconomic variables, such as trade openness, which could influence results.

Adeniran, Yusuf, and Adeyemi (2022) applied a Vector Autoregressive (VAR) model to examine the effects of exchange rate movements on both Nigeria's import levels and economic growth. They found that depreciation raises import costs and contributes to short-run inflation but does not significantly curb import volumes. The study's strength lies in treating the exchange rate as both a trade and macroeconomic factor, highlighting how inflation erodes purchasing power. However, the analysis does not estimate long-run elasticities or differentiate imports by type, potentially masking heterogeneity in responsiveness.

Emeka and Abiodun (2022), using Johansen cointegration techniques, found a strong long-run relationship between exchange rate changes and import volumes, yet short-term responsiveness remained weak due to the inelastic nature of import demand. Their study is notable for its robustness checks and extensive temporal coverage, though it excludes policy variables such as tariffs or trade regulations, which could influence outcomes. Eze and Ogbuagu (2022) examined exchange rate volatility and its differential impact on import categories—capital, consumer, and intermediate goods—using high-frequency data and advanced econometric models. Their findings suggest that capital and intermediate goods are more sensitive to exchange rate changes than consumer goods, offering valuable insights for targeted policy interventions. Nevertheless, the study does not incorporate post-COVID-19 dynamics, which may have significantly altered trade behavior.

Chukwu and Nwachukwu (2021) employed a Structural Vector Autoregression (SVAR) to assess how imports respond to exogenous exchange rate shocks. Their results indicate that while short-term shocks affect imports immediately, these effects dissipate quickly without long-term trade pattern changes. The study is strengthened by its structural decomposition and simulation of real-time scenarios but does not account for Nigeria's dependence on oil revenues, which heavily influences foreign exchange availability.

Nwachukwu and Odili (2021) focused on the manufacturing sector, applying a Vector Error Correction Model (VECM) to study the effect of depreciation on industrial imports. They found that depreciation raises capital goods costs, slowing industrial productivity. While sector-specific insights are a strength, reliance on secondary data may limit causal interpretation.

Iyoha and Oriakhi (2021), using ARDL bounds testing, investigated both short- and long-run relationships between exchange rate, real income, and import demand. They found that while a long-run equilibrium exists, real income is a more decisive factor than exchange rates. The study's extended data coverage and methodological rigor are major strengths, but it does not account for external shocks such as oil price volatility or capital flows, nor does it fully explore dual exchange rates and forex rationing.

Ude and Ekesiobi (2020) employed a VECM to examine exchange rate volatility's impact on Nigeria's external trade. Their results show that volatility negatively affects imports, particularly intermediate goods critical for manufacturing. While the study benefits from disaggregated data and attention to both short- and long-run dynamics, it omits governance quality and inflationary feedback effects.

Ogundipe and Aworinde (2020) analyzed exchange rate misalignment using panel cointegration across selected ECOWAS countries. They concluded that persistent misalignment distorts imports and contributes to trade imbalances. The comparative approach is a strength, but direct generalization to Nigeria may be limited.

Adeoye and Ojo (2019) examined the bidirectional relationship between exchange rate and import demand using cointegration and Granger causality tests. They found that exchange rate movements influence imports and vice versa. While the feedback modeling improves realism, the study does not consider the efficiency of forex policy enforcement or institutional quality.

Babatunde and Egwaikhide (2019) explored long- and short-run determinants of import demand using cointegration and error correction methods. They confirmed a significant long-run relationship between imports,

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International Journal of
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income, and exchange rate, highlighting the high income elasticity of import demand. However, the weak effect of exchange rate depreciation suggests that policy alone may not reduce import levels, and the study does not sufficiently account for structural issues such as import substitution failures and infrastructural constraints.

Olayemi and Akande (2019) applied ARDL modeling to assess the impact of exchange rate changes on agricultural imports, finding weak sensitivity due to persistent high food demand. The focus on food security enhances policy relevance, though the study overlooks regional trade agreements like ECOWAS protocols.

Adebayo and Onanuga (2019) examined long-run import demand using ARDL and found that while short-run effects of exchange rate changes are significant, long-run adjustments are limited by structural rigidities. Their inclusion of control variables such as inflation and interest rates is a strength, but the study lacks sectoral analysis. Akpan and Atan (2018) used GARCH models to examine how exchange rate volatility affects import demand. They demonstrated that volatility introduces uncertainty, raises hedging costs, and dampens imports in the short run, while long-run effects are limited due to inelastic import demand. The study's aggregate approach, however, does not capture sector-specific differences. Oladipo (2017) investigated the J-Curve effect in Nigeria using cointegration and impulse response functions. Findings confirm that trade balances initially worsen following depreciation but gradually improve over time. The study's dynamic modeling approach is a strength, though Nigeria's weak non-oil export base may delay or weaken long-run improvements.

Obiora and Nwankwo (2017) employed ECM and causality tests, finding unidirectional causality from exchange rate volatility to import levels. While methodologically clear, the study does not consider mediating factors like foreign reserves or policy interventions.

Despite this extensive literature, key gaps remain. Many studies rely on aggregate import data, obscuring sector-specific sensitivities and limiting targeted policy recommendations. While some studies consider dual rates or disaggregation, few integrate institutional factors such as trade policy enforcement, forex management, or political stability. Informal trade and speculative forex activities—prevalent in Nigeria—are often ignored, yet they significantly distort official rates. Furthermore, common methodologies like ARDL and VAR may fail to capture non-linear effects or structural breaks from external shocks such as COVID-19, oil price crashes, or monetary reforms. Causality over multiple time horizons and threshold effects are also rarely explored. This study aims to address these gaps by combining linear and non-linear modeling, disaggregating import categories, and explicitly accounting for institutional and macroeconomic mediators over the period 1990–2023.

DISCUSSION AND INFERENCES

This study employs secondary time series data obtained from the official publications of the Central Bank of Nigeria (CBN) and the World Bank Development Indicators. The data covers the period from 1990 to 2023 and includes variables relevant to imports, exchange rate, gross domestic product (GDP), inflation rate, interest rate, and other macroeconomic indicators. Import demand function adapted from earlier works such as Akpan and Atan (2018) and Babatunde (2019).

Their as specified as: IMP = f(EXCH, GDP, INF, GEXP) ..... (3.1)
Where; IMP = Imports (proxy for total value of goods imported) EXCH = Exchange rate; GDP = Gross Domestic Product; INF = Inflation rate; and GEXP = Government expenditure

The modified functional form of this model is specified as:
IMP = f(EXCH, GDP, INF, INT) ..... …….(3.2)

Where; IMP = Imports (proxy for total value of goods imported); EXCH = Exchange rate; GDP = Gross Domestic Product; INF = Inflation rate and INT = Interest rate

Equation (3.1) can be expressed in an econometric form as:
$IMP_t = \beta_0 + \beta_1 EXCH_t + \beta_2 GDP_t + \beta_3 INF_t + \beta_4 INT_t + \mu_t$ ..... (3.3) Where; β_0 = Constant term; $\beta_1 - \beta_4$ = Coefficients to be estimated μ_t = Error term

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Apriori Expectations

It is expected that exchange rate depreciation (higher EXCH values) will negatively affect imports due to rising import costs ($\beta_1 < 0$). GDP is expected to positively influence imports ($\beta_2 > 0$), inflation is expected to reduce imports due to erosion of purchasing power ($\beta_3 < 0$), and high interest rates are expected to discourage import financing ($\beta_4 < 0$). The study will adopt the Auto-Regressive Distributed Lag (ARDL) model to examine both shortrun and long-run relationships between exchange rate and imports. The ARDL method is appropriate when the variables are of mixed order of integration, i.e., I(0) and I(1), but none is I(2). It also allows for the estimation of dynamic error correction models that distinguish between short-run and long-run dynamics.

Descriptive statistics will be used to summarize the basic features of the dataset. Measures such as mean, median, standard deviation, minimum and maximum values, skewness, and kurtosis will be computed. The Jarque-Bera test will be applied to test the normality of the variables. To avoid spurious regression, the stationarity properties of the data will be tested using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The tests will determine whether the variables are stationary at level I(0) or first difference I(1). If the variables are found to be I(0) and I(1), the ARDL Bounds Test will be applied to determine the existence of a long-run relationship among the variables. The Breusch-Godfrey Serial Correlation LM test will be used to check for autocorrelation in the residuals. The Breusch-Pagan-Godfrey test will be conducted to determine the presence of heteroskedasticity in the residuals. The Variance Inflation Factor (VIF) will be calculated to test for multicollinearity among the independent variables. The Jarque-Bera test will be employed to ensure that the residuals are normally distributed. These diagnostic and robustness checks will validate the reliability and accuracy of the model estimates.

Table 1: Descriptive Statistics

	IMP	EXCH	GDP	INF	INT
Mean	293.1002	5.692381	18.06152	39.04763	17.06122
Median	67.73860	5.9020910	12.56511	32.37450	12.08252
Maximum	1676.403	1.1520011	32.87322	123.9321	22.87322
Minimum	22.67890	6.5220109	5.420366	10.74789	32.87322
Std. Dev.	416.1319	3.9982810	16.11739	28.89583	18.43327
Skewness	2.000958	0.033423	2.212969	1.182637	2.0426511
Kurtosis	6.419948	1.332102	6.889311	3.755141	2.0211022
Jarque-Bera	38.10314	3.831235	47.73405	8.476537	6.653711
Probability	0.000000	0.147251	0.000000	0.144330	0.00002
Observations	33	33	33	33	33

Source: Author compilation using E-view 10, 2025.

Table 1 is the descriptive statistics of the variables employed in the study. The result in the above table shows that the mean value of all the variables employed in this study are positive with IMP having the highest average value of with (293.1002), INF (39.04763) and GDP (18.06152) INT (17.06122) EXCH (5.6923810) have second, third, fourth and fifth mean values respectively. While, the maximum and minimum changes range positive to positive for all the variables, this implies that, the values for all the variables (IMP, EXCH, GDP, INF and INT) have been on the increase over the duration of the scope of study. The descriptive statistics further reveals that the distribution of IMP have the highest sum standard deviation from its sample means with the values of 416.1319. This implies that it is the most volatile variables employed in this study. On the other hand, EXCH, INF, INT and GDP have the lowest standard deviations from their respective sample means, implying that these variables are the least volatile variables selected for the study.

The skewness of a normal distribution is zero, which measures the symmetric of the distribution of the series around the mean. The closer the skewness value is to zero, the closer the distribution of a data set of a variable resembles that of a normal distributed. From table 1 it indicates that all variables employed in this study are all positively skewed. For kurtosis, variables such as IMP,

INF and GDP are platykurtic as they have wide spread from the mean which is greater than three (3) while EXCH is leptokurtic as its value is less than three (3).

Finally, the Jaque-Bera statistics showed that the null hypothesis that IMP and EXCH are normally distributed cannot be rejected as the normality of the variable are statistically insignificant at 5%, while the null hypothesis that INF and GDP is normally distributed cannot be accepted as the normality of the variable are statistically

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of

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significant at 5%. Therefore, half of the variables used in the study are normally distributed. This implied that Ordinary least square estimator becomes inappropriate, thereby justifying our choice of ARDL and Bound test used in the study's estimation technique. The unit root was conducted in order to ascertain the stationarity properties of the series employed in the study. The data are annual time series data ranging from 1990 to 2024. The study employed the Augmented Dickey-Fuller (ADF) method of testing for stationarity. The ADF unit root results are shown in table 4.2

Table 2: ADF Unit Root Results

Variables	At level statistics	t-critical value (5%)	First diff. (t-statistics)	Critical value (5%)	Order of integration
LIMP	-0.702215	-2.957110	-4.536979	-2.960411	I(1)
EXCH	5.577500	-2.981038	-	-	I(0)
INF	-2.130052	-2.957110	-6.333339	-2.976263	I(1)
GDP	-1.968155	-2.957110	-6.848554	-2.960411	I(1)
INT	-1.472130	-2.957110	-6.864372	-2.960411	I(1)

Source: Author's Compilation using E-view 10, 2025

The result of the ADF unit root test in table 2 above showed that EXCH was stationary at level, while at first difference LIMP, INF, GDP and INT were stationary. This was however achieved by comparing the ADF test statistics with their respective critical values at 5% level of significance. The order of integration of the variables shows that it is a mixed series [order I(0) and I(1)] which implies that there may be a long run relationship between and among the variables. Furthermore, the ADF statistics confirmed an Auto Regressive Distributed Lag (ARDL) will be a better estimate. From the results of the unit root test the order of integration showed that performing a cointegration test is necessary however the appropriate technique for testing for co-integration is the bounds test

Table 3: The result from the ARDL Bound Tests

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	13.96963			
K	3	5%	2.39	3.37

Source: Author's compilation using E-views 10.0, 2025

Since at 5% significance level the value of the F-Statistics (13.96963) is greater than critical value of the upper bound (3.37) we reject the null hypothesis Ho and then conclude that there exist a cointegrating equation and hence a long run relationship. Therefore, we employed the ARDL for the estimation of the model in the study.

Table 4: ARDL Long Run Model

Variable	Coefficient	Std. Error	t- Statistic	Prob.*
Dependent variable: LEMP				
LIMP(-1)	0.319874	0.123070	2.599130	0.0194
EXCH	0.000174	0.000398	0.437217	0.0410
EXCH(-1)	0.000384	0.000592	0.648100	0.0042
EXC(-2)	-0.001338	0.000602	-2.223085	0.0678
EXCH(-3)	-0.002086	0.000626	-3.329840	0.0542
GDP	0.000329	0.002284	0.144029	0.8873
GDP(-1)	0.004191	0.002675	1.566727	0.1367
GDP(-2)	0.003689	0.001925	1.916184	0.0734
INF	0.002006	0.001065	1.884286	0.0078
INF(-1)	-0.000494	0.001076	-0.459744	0.6519
INF(-2)	-0.001931	0.001274	-1.515408	0.1492
INF(-3)	0.004367	0.001185	3.684278	0.0020
INT	0.000174	0.000398	0.437217	0.0410
	0.000384	0.000592	0.648100	0.0042
	-0.001338	0.000602	-2.223085	0.0678
	-0.002086	0.000626	-3.329840	0.0542
C	14.63987	2.738360	5.346217	0.0001

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of

Asian Economic Light (JAEL) – Peer Reviewed Journal

SJIF Impact Factor (2026): 8.835 Volume: 14 | Issue: 3 | March 2026

Short-Run Relationship

Variable	Coefficient	Std. Error	t- Statistic	Prob.
C	14.63987	1.780114	8.224119	0.0000
D(EXCH)	0.000174	0.000347	0.502428	0.6222
D(EXCH(-1))	0.003424	0.000486	7.038751	0.0000
D(EXCH(-2))	0.002086	0.000519	4.021960	0.0010
D(GDP)	0.000329	0.001789	0.183928	0.0064
D(GDP(-1))	-0.003689	0.001517	-2.431432	0.8272
D(INF)	0.002006	0.000807	2.487036	0.0243
D(INF(-1))	-0.002436	0.000878	-2.774530	0.0135
D(INF(-2))	-0.004367	0.001063	-4.106780	0.0008
D(INT)	0.000174	0.000347	0.502428	0.62220.
D(INT(-1)	0.003424	0.000486	7.038751	0.00100
D(INT(-2)	0.002086	0.000519	4.021960	0.0022
CointEq(-1)*	-0.680126	0.083493	-8.145902	0.0000
R-squared	0.827311			
Adjusted R-squared	0.736422			
Prob(F-statistic)	0.000024			
Durbin-Watson stat	2.134383			

Table 4 above reveals that the coefficient of constant C is 14.46987, which implies that holding other variable constant LIMP will increase by 14.46987, with a probability of 0.0001 lesser than the level of significance 0.05, this shows that the variable is significant. The coefficient of LIMP in the first lagged period is 0.319874, the sign is positive with a probability value of 0.0194 which shows that LIMP is significant at 5% level of significance. This correspond with comparing the respective absolute value of the t-statistics and t-tabulated. This reveal the effect of other variables aside the ones employed in this study on important in Nigeria. The coefficient of EXCH in the current and lagged periods is 0.000174, 0.000384, -0.001338 and -0.002086 respectively, the sign is positive in the current and first lagged period which is in line with the a priori expectation, while in the second and third lagged period the sign is negative which contradict the a priori expectation.

The results therefore imply that a unit change in EXCH in the current and first lagged period will lead to a corresponding increase in the LIMP by 0.000174 and 0.000384 respectively, while in the second and third lagged period a unit change in EXCH will lead to a corresponding decrease in the LIMP by 0.001338 and 0.002086. In addition, at 5% level of significance EXCH, EXCH (-1), EXCH (-2) and EXCH (-3) with a corresponding probability value of 0.0410 and 0.0042 is significant while 0.0678 and 0.0542is not significant. This correspond with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that exchange rate has a significant effect on import in Nigeria. Although only in the current and first lagged period.

The coefficient of GDP in the current and lagged periods is 0.000329, 0.004191 and 0.003689 respectively, the sign is positive in which is inline with the a priori expectation. The results therefore imply that a unit change in GDP in the current and lagged periods will lead to a corresponding increase in the LIMP by 0.000329, 0.004191 and 0.003689 respectively. In addition, at 5% level of significance GDP, GDP (-1) and GDP (-2) with a corresponding probability value of 0.8873, 0.1367 and 0.0734 is insignificant. This correspond with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that economic growth has no significant effect on import in Nigeria. The coefficient of inflation in the current and lagged periods is 0.002006, -0.000494, -0.001931 and 0.004367 respectively, the sign is positive in the current and third lagged period which is not in line with the a priori expectation, while in the first and second lagged period the sign is negative which is in with the a priori expectation. The results therefore imply that a unit change in INF in the current and third lagged period will lead to a corresponding increase in the LIMP by 0.002006 and 0.004367 respectively, while in the first and second lagged period a unit change in INF will lead to a corresponding

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of

Asian Economic Light (JAEL) – Peer Reviewed Journal

SJIF Impact Factor (2026): 8.835 Volume: 14 | Issue: 3 | March 2026

decrease in the LIMP by 0.000494 and0.001931. In addition, at 5% level of significance INF, INF (-3) INF (-1) and INF(-2) with a corresponding probability value of 0.0078 and 0.0020 is significant while 0.6519 and 0.1492 is insignificant respectively. This corresponds with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that inflation has a significant effect on import in the third lagged period in Nigeria.

The coefficient of INT in the current and lagged periods is 0.000174, 0.000384, -0.001338 and 0.002086 respectively, the sign is positive in the current and first lagged period which is in contradict the a priori expectation, while in the second and third lagged period the sign is negative which is in line with the a priori expectation. The results therefore imply that a unit change in INT in the current and first lagged period will lead to a corresponding increase in the LIMP by 0.000174 and 0.000384 respectively, while in the second and third lagged period a unit change in INT will lead to a corresponding decrease in the LIMP by 0.001338 and 0.002086. In addition, at 5% level of significance INT, INT (-1), INT (-2) and INT (-3) with a corresponding probability value of 0.0410 and 0.0042 is significant while 0.0678 and 0.0542is not significant. This correspond with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that interest rate has a significant effect on import in Nigeria. Although only in the current and first lagged period.

From Table 4 in the short run, the coefficient of EXCH in the current and lagged periods is positive. The results therefore imply that a 1 unit change in EXCH will lead to a corresponding increase in the LIMP by 0.000174, 0.003424 and 0.002086. In addition, at 5% level of significance EXCH and EXCH(-1) and EXCH(-2) with the corresponding probability values of 0.6222 which is insignificant and 0.0000, 0.0010 respectively which is significant. This correspond with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that exchange rate has a significant effect on import in Nigeria.

The coefficient of GDP in the current period is positive. The results therefore imply that a 1 unit change in GDP will lead to a corresponding increase in the IMP by 0.000329, while in the first lagged period the coefficient is negative, this imply that a 1 unit change in GDP will lead to a corresponding decrease in the LIMP by 0.003689. In addition, at 5% level of significance GDP and GDP(-1) with the corresponding probability values of 0.0064 which is significant and 0.8243 which is insignificant. This correspond with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that economic growth causes significant change on import in Nigeria. The coefficient of INF in the current period is positive. The results therefore imply that a 1 unit change in INF will lead to a corresponding increase in the LIMP by 0.002006.while in the first and second lagged periods the sign is negative, which implies that a 1 unit change in INF will lead to a corresponding decrease in the LIMP by 0.002436 and 0.004367. In addition, at 5% level of significance INF ,INF(-1) and INF(-2) with the corresponding probability values of 0.0243, 0.0135 and 0.0008 respectively which is significant. This correspond with comparing their respective absolute values of the t-statistics and t-tabulated. This implies that inflation has a significant effect on import in Nigeria.

Finally, the Error Correction Term (ECT) represented by CointEq(-1) must be between -1 and 0. The ECT which is the rate of adjustment is -0.68, this signifies that the previous periods deviation of INF from long run equilibrium is corrected at an adjustment speed of 68% within a year. The R- Square (R2) 0.827311 tells us the efficacy or capacity or efficiency of the independent variables in explaining the changes that occur in dependent variables. A high valued R2 is usually appreciated as it gives- off a higher percentage of acceptability. Thus, the variations or changes that occur in the dependent variables can be explained accurately at 96.33% .The adj. R2 0.736422 does or perform the same task as the R2. In most instances it is used as a check on the trust worthiness of the R2 .(Prob) F statistics 0.000000 at the 0.05 level of significance. This is usually a rough role of thumb to check whether overall the variables in the model were significant in explaining the relationships within the model (goodness of fit 0f variables in the model). The result suggests a0.000024 probability value, which is less than the 0.05 level of significance. This implies that the variables in the model are a really good fit. The result of the F-statistics probability was further supported by F-calculated and F-tabulated. The F-calculated value is greater than F-tabulated value therefore we reject the null hypothesis and conclude that model is a good fit in explaining the relationships of the variables.

The Durbin Watson 2.134383, the Durbin Watson usually is used to check for auto correlation in the model. A model becomes questionable if it has a Durbin Watson value that is less or higher than 2, and is not approaching

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741
International Journal of
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2 in closeness or proximity, this might lead to spurious regression and make the results of the regression failing to explain the elasticities of the variables involved in the study. Thus, our model is free from serial correlation.

Table 5 Granger Causality Test Result Pairwise

Null Hypothesis	Obs	F-Statistic	Prob.
EXCH does not Granger Cause LIMP	31	0.33402	0.7191
LIMP does not Granger Cause EXCH	31	0.54354	0.0471

Source: Author's compilation using E-views 10.0 2025

Here, the decision rule is to reject H_0 and conclude that there is a significant causal relationship between the two variables if the p-value of the F-stat is less than 5%.

The table 5 shows that EXCH does not granger cause LIMP, but LIMP granger cause EXCH. Given that the probability value of EXCH is 0.7191 which is not significant at5% level of significance, that of LIMP is 0.0471 and is significant at 5% (0.05). This implies that we are inclined not accept the null hypothesis and therefore conclude that there is uni directional causal link between EXCH and LMP in Nigeria.

Table 6: Post Estimation Test

	F-statistic	Prob
Breusch-Godfrey Serial Correlation LM Test	2.556369	0.1131
Heteroskedasticity Test: Breusch-Pagan-Godfrey	0.777607	0.6726
Normality Test	2.344570	0.309659

Source: Author's compilation using E-views 10.0, 2024

From the Table 4.6 with the null hypothesis of no serial correlation and at 5% significance level the above table shows that there isn't a presence of serial correlation. From the table, the probability value of the Breusch-Godfrey Serial Correlation LM test (0.1131) is greater than 5% (0.05) we therefore inclined not to reject the null hypothesis (Ho) and conclude that the model is free serial correlation. The Breusch-Pagan-Godfrey Heteroskedasticity test (0.6726) greater than 5% (0.05) we therefore inclined not to reject the null hypothesis (Ho) and conclude that the model is free from heteroskedasticity (that is to say the model is homoscedastic). The probability value of the Jarque-Bera Statistics of 0.309659 is above 0.05 (at 5%) and this is not significant therefore we do not reject the null hypothesis and conclude that the model is normally distributed.

Fig 2 :Cusum Test

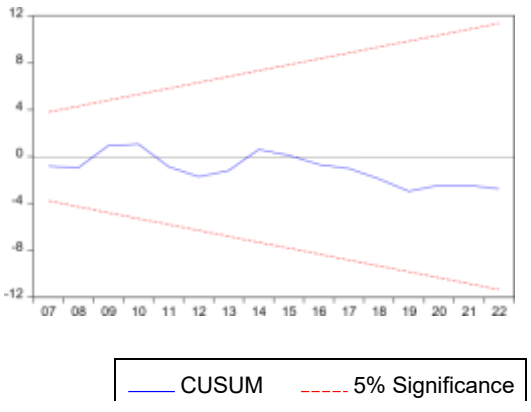
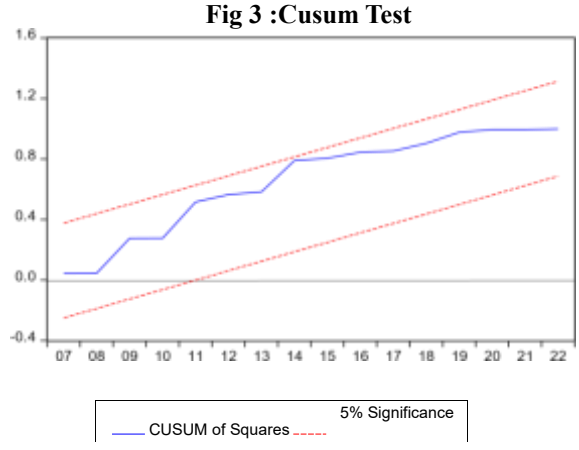


Fig 3 :Cusum Test



Source: Author's compilation using E-views 10.0, The model is stable as it lies with the 5% boundary.

The CUSUM test operates on the principle that a model is considered dynamically stable if the plotted blue line remains within the red boundaries. As observed in the accompanying graph, the blue line stays within these limits, indicating that the model is dynamically stable over the sample period.

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of
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The empirical analysis of this study began with preliminary tests, including descriptive statistics and unit root assessments. Descriptive statistics revealed that all variables had positive mean values, with imports recording the highest average, followed by inflation, GDP, interest rate, and exchange rate. Volatility, measured by standard deviation, was highest for imports, whereas exchange rate, inflation, GDP, and interest rate were comparatively less volatile. Skewness analysis showed that all variables were positively skewed. Kurtosis results indicated that imports, inflation, and GDP exhibited a platykurtic distribution, while exchange rate was leptokurtic. The Jarque-Bera test confirmed that some variables, such as imports and exchange rate, were normally distributed, while others were not, supporting the use of the ARDL approach over ordinary least squares.

Unit root testing using the Augmented Dickey-Fuller (ADF) method revealed that the exchange rate was stationary at level (I(0)), while imports, inflation, GDP, and interest rate became stationary after first differencing (I(1)). The mixed integration order validated the selection of the ARDL model. Further, the ARDL bounds test indicated the existence of a long-run relationship among the variables, as the calculated F-statistic exceeded the upper bound critical value at the 5% significance level. This suggests that, despite short-term fluctuations, imports and their determinants—particularly the exchange rate—tend to revert to equilibrium over the long run.

Addressing the study's first objective, the short-run ARDL results showed that the exchange rate had a significant positive impact on imports in the current and first lagged periods. This finding contrasts with the expected outcome, where depreciation is supposed to discourage imports by raising the cost of foreign goods. In the second and third lagged periods, the exchange rate exerted a negative, though statistically insignificant, effect. These results suggest that in the short term, naira depreciation can actually increase imports due to Nigeria's heavy reliance on foreign goods and raw materials. Over the long term, however, sustained depreciation tends to suppress imports as higher costs gradually take effect.

Long-run ARDL estimates confirmed that exchange rate fluctuations significantly influence imports, with effects alternating between positive and negative across different periods. The error correction term (–0.68) was significant, indicating that short-term disequilibrium is corrected at an annual rate of 68%, reinforcing the presence of a stable long-run relationship. In essence, while short-term exchange rate changes can temporarily destabilize import demand, the economy gradually adjusts, restoring equilibrium in the long run.

Granger causality tests were used to assess the direction of influence between exchange rate and imports. The results revealed a unidirectional causality running from imports to exchange rate, but not vice versa. This indicates that rising import demand places pressure on foreign exchange markets, contributing to naira depreciation. Conversely, fluctuations in the exchange rate did not significantly affect import demand, suggesting that Nigeria's imports are largely structurally determined and relatively insensitive to currency movements.

In summary, the findings highlight that the exchange rate plays a significant role in shaping Nigeria's import demand in both the short and long run. However, the unidirectional causality from imports to exchange rate underscores the economy's vulnerability to external trade pressures, where persistent dependence on imports contributes more to exchange rate instability than currency depreciation does to reducing import volumes.

CONCLUSION AND RECOMMENDATIONS

From the overall assessment of the estimation results and interpretations of the study, the following conclusions were arrived at; exchange rate has a significant effect on imports in Nigeria. The study thus concludes that exchange rate is a crucial economic variable that influences the volume of imports in the country, as it has both short-run and long-run effects. Specifically, exchange rate depreciation increases the cost of foreign goods and services, thereby reducing the volume of imports, while appreciation of the naira makes imports cheaper, leading to an increase in importation. This implies that fluctuations in the exchange rate directly shape Nigeria's import demand, given the country's high dependence on imported goods. Furthermore, the Granger causality result established the presence of a uni-directional causality running from exchange rate to imports, indicating that changes in exchange rate significantly drive changes in imports, but not vice versa.

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

i. The federal government through the Central Bank of Nigeria should implement sound exchange rate management policies that would ensure stability of the naira. A stable exchange rate will reduce uncertainty in the import market and help importers plan effectively.

Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

International Journal of
Asian Economic Light (JAEL) – Peer Reviewed Journal
SJIF Impact Factor (2026): 8.835 Volume: 14 | Issue: 3 | March 2026

ii. The government should encourage domestic production of goods that are heavily imported, through policies such as tax incentives, subsidies, and credit facilities to local manufacturers. This will reduce the pressure on foreign exchange demand for imports and lessen the economy's dependence on imported goods.

iii. The federal government should diversify the economy and strengthen non-oil sectors, especially manufacturing and agriculture, to reduce overreliance on imports. By boosting local industries, the demand for foreign goods would decline, thereby reducing the negative impact of exchange rate fluctuations on imports.

iv. The Central Bank of Nigeria should also adopt a transparent and market-friendly foreign exchange allocation system to ensure importers, especially of essential goods, have easy access to forex at affordable rates. This would reduce the distortion created by parallel market activities.

v. Finally, trade policies should be harmonized with exchange rate policies, ensuring that tariffs, import restrictions, and forex management are consistent in promoting domestic industries while maintaining a sustainable level of imports.

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Journal DOI: 10.36713/epra0412 ISSN: 2277–7741

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