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# RELATIONSHIP BETWEEN EXCHANGE RATE AND NIGERIA'S EXTERNAL TRADE: A GRANGER CAUSALITY ANALYSIS

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**Abstract**

The study examines the relationship between exchange rate fluctuations and Nigeria's external trade balance during a 43-year period from 1981 to 2023. Trade balance, exchange rate, inflation rate, RGDP, and money supply were sourced from various yearly published statistics of the Central Bank of Nigeria and the World Bank data repository. The collected data were analyzed using the Granger causality model. The exchange rate was established to influence trade balance despite its fluctuation and persistent uncertainty. Money supply and trade balance also influenced each other. In line with the finding of the study, Nigeria should implement timely monetary policy intervention to track exchange rate movements and mitigate adverse balance of trade effects. The government should also promote policies that improve trade logistics to enhance a strong trade balance without necessarily devaluing the Naira.

## 1. INTRODUCTION

The exchange rate is of crucial importance to Nigeria's economy as it virtually affects all aspects of economic activity, from trade to inflation and investment. The exchange rate of the currency, which influences global trade, is a major determinant of import and export prices. The pricing of products and services, especially those

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imported, is directly impacted by changes in the currency rate because Nigeria is a net importer. A weaker naira makes Nigerian exports cheaper for foreign buyers, potentially increasing export revenues (Central Bank of Nigeria, 2021). However, the depreciation of the naira also raises import costs, leading to higher prices for imported goods. This has particularly impacted Nigeria's import-driven inflation, where the rising cost of heavily imported goods, such as fuel and food, contributes to higher overall price levels in the economy. As the naira value falls, the country experiences inflation, which can reduce the consumer's buying power and increase the cost of living. Ojo and Ibrahim (2018) highlighted how these exchange rate fluctuations often lead to persistent inflationary pressures, a problem that has plagued Nigeria's economy, especially during periods of significant naira devaluation.

Trade is a repeated sequence of goods exchanges through market transactions (Stephen and Obah, 2017). It is referred to as international trade if it involves transactions beyond the boundaries of a sovereign political authority (Salvatore, 2016). According to Okeke, Okeke, and Okereke (2023), international trade is the system by which nations export and import goods, services, and capital. The external trade balance plays a critical role in shaping Nigeria's overall economic performance, influencing several key macroeconomic indicators such as currency stability**,** inflation**,** foreign exchange reserves, and economic growth. Nigeria's external trade balance is largely driven by its reliance on crude oil exports, which account for over 90% of the country's export revenue. Meanwhile, the country continues to import a wide range of goods, including refined petroleum products, machinery, and consumer goods (Ohalezim, 2022). This heavy import reliance has led to persistent trade deficits, as Nigeria's import bill often exceed its export earnings, creating an imbalance that exerts significant pressure on the naira **(**Zadeh, 2025). When Nigeria faces a trade deficit, foreign currency demand, especially the US dollar increases, weakening the naira. This depreciation raises the cost of imports, which, in turn, drives up the domestic prices of goods and services, contributing to the inflation of imported goods. For a country like Nigeria, which depends heavily on imports for essential goods like fuel, food, and industrial machinery, a weaker currency can lead to higher production costs, pushing inflation even higher and eroding Nigerian consumers' purchasing power (Adejo, 2024).

The exchange rate significantly influences Nigeria's external trade balance, shaping the relationship between exports and imports and directly impacting the nation's economic performance (Nwaolisa, 2017). A country's external trade balance is the difference between the value of its imports and exports of goods and services (Aduragbemi, 2018). The exchange rate plays a vital role in determining the cost competitiveness of Nigeria's exports. Nigeria's naira exchange rate and external trade balance are closely linked, with fluctuations in one often driving changes in the other (Ijirshar, Okpe and Andohol, 2022). A persistent trade deficit, where imports exceed exports, typically leads to currency depreciation, which in turn intensifies the trade imbalance (Aduragbemi, 2018). This dynamism has significant implications for Nigeria's economy, influencing inflation**,** foreign exchange reserves, and economic growth. Nigerian exchange rate policies frequently delicate and contentious, primarily because structural changes must be made, such as reducing imports while boosting non-oil exports, leading to a decline in the nominal currency rate. These domestic changes are seen as detrimental to the economy because of their immediate effects on demand and prices (Echobu, Kighir and Odunko, 2024).

The exchange rate also impacts Nigeria's industrial capacity and overall economic growth. When the naira depreciates, it becomes more expensive to import the capital goods, raw materials, and machinery needed for industrial production. This increases Nigerian manufacturers' production cost, leading to reduced industrial output. The higher cost of production may reduce Nigerian goods' competitiveness in the global markets, further limiting export growth. Thus, a weaker naira impedes Nigeria's efforts to diversify its exports beyond oil and foster a more balanced external trade relationship (Ogunbukola, 2024).

The trade deficit also has implications for Nigeria's foreign exchange reserves, which are used to finance the country's imports (Echobu, et al., 2024). When reserves run low, the CBN may find it difficult to support the naira, leading to further currency depreciation. This depletion of reserves creates a situation in which the government and the central bank constantly manage a fragile balance between supporting the exchange rate and maintaining sufficient reserves to meet import needs. Therefore, the depreciation of the naira triggers a cycle of weakening reserves and worsening the trade deficit. Additionally, the foreign debt burden increases as a weaker naira makes servicing foreign denominated debt more expensive. This, in turn, takes away valuable government resources that could have been used for infrastructure development, social services, or investment in key economic sectors (Ogunbukola, 2024). Although some progress has been made in promoting non-oil exports, the scale of diversification has not been sufficient to significantly reduce the trade deficit. Policy inconsistency has also been a significant challenge. Frequent changes in foreign exchange policies from fixed to floating exchange rate systems create uncertainty among domestic and foreign investors who may be reluctant to invest in an environment of volatile currency fluctuations. This has led to capital flight and a reduction in the flow of FDI, which is necessary for improving the country's export capacity and reducing the trade imbalance. Moreover, Nigeria's infrastructure deficits, particularly in electricity, transportation, and technology, increase local industries production cost, making it difficult for Nigerian goods to compete internationally. The country continues to face challenges in developing a competitive manufacturing sector and improving agricultural productivity, which significantly limits its ability to increase exports (Ikuemonisan, 2024).

To this effect, this study addresses the imminent research questions:

i. What are the trends in the naira exchange rate, money supply, external trade balance, inflation rate, and gross domestic product in Nigeria?

ii. What is the causal association among the naira exchange rate, external trade balance and other variables in Nigeria?

## 2. STUDY HYPOTHESIS

The study hypothesis is as follows

$H_{01}$: There is no causal relationship between naira exchange rate and other identified macroeconomic variables in Nigeria during the study period.

## 3. LITERATURE REVIEW

### 3.1 Theoretical Review

#### a. Marshall-Lerner Elasticity Approach and the JJ-Curve Theory

The balance of trade adjustment path is evaluated using the elasticity of import and export demand in the elasticity approach. The quantity of services or commodities that are responsive to unstable prices is referred to as demand elasticity. By modeling nominal export and import prices in relation to import and export volumes, Bickerdike was the first to devise and establish the 'Elasticity Approach, which is known as the Bickerdike-Robinson-Metzler condition. Robinson and Metzler further clarified and elaborated on Bickerdike's innovative concept, adding to the elasticity method. According to the theory, the volume of trade as well as the export and export supply coupled with the demand elasticity evaluate how much the foreign currency changes in relation to trade. The quantity and value reactions to change in the actual currency rate are central to the elasticity approach analysis. Hence, the same reasoning holds true for domestic demand. Nonetheless, foreign demand for local goods typically rises when domestic prices fall because of currency devaluation, but only in cases where foreign demand is elastic.

The volume of local items tends to increase, surpassing the decrease in export value brought by the declined prices when foreign consumers' demand elasticity for locally produced goods is low. For instance, local

demand elasticity can be interpreted in the same way by adhering to the same concepts. Local consumers' behavior will be altered in response to changes in domestic market prices if local demand for overseas goods is elastic. Therefore, the value of imports will decline customers compensating for this by purchasing local products instead of imports. In conclusion, the trade balance will be enhanced if the value of import decreases more than the fall in the value of local exports.

When a nation has a trade balance deficit, monetary officials often employ the elasticity approach. To assess how devaluation impacted the trade balance, it is necessary to consider how responsive imports and exports are to fluctuations in the local currency. A slight shift in the spot exchange rate could have a significant influence on the balance of trade if both local and global import and export demand is elastic. An additional development of the elasticity technique is the Marshall-Lerner Condition. The condition could be interpreted because of Bickerdike's work. Similarly, Marshall believed that if monetary officials weaken the currency to improve trade balance, demand for the country's imports and exports would have to be sufficiently elastic. This is because, under the assumptions that there is no invisible trade and the trade account equals the current account, the elasticity values of both import and export are greater than one. In contrast, when the local currency depreciates, the balance of trade worsens if the amount is less than unity. The hypothesis is primarily predicated on two assumptions, which distinguishes it from Bickerdike's method. First, as exchange rates depreciated, trade was originally balanced, implying that the value of imports and exports was equal. Second, and perhaps most significantly, supply elasticity is limitless as prices are fixed in the seller's currency.

**b. The Absolute Advantage Theory**

The benefits that can be accrued to a country by embracing the global division of labor are the basis of Adam Smith's postulations. Smith opined that rising output is the result of specialization in production. According to him, a country involved in cross-border trade should focus on producing only goods with a clear competitive edge. Thereafter, the country can import more affordable goods made by its trade and sell some of those items abroad. Smith asserted that this method would lead to increased efficiency worldwide. The theory is predicated on the following suppositions: only two countries are involved in the trade; the two countries only exchange two items; and the countries' resource input levels are equal.

However, this hypothesis is not without its detractors. The labor theory of value serves as the foundation for the theory. The theory solely included labor as a factor of production and only focused on how many workers each country had on hand and how well they were able to manufacture the items in issue. Other factors that may have aided in the manufacturing process were not captured.

**c. The Comparative Cost Advantage Theory**

David Ricardo, the proponent of this theory postulated that nations can still gain from one another even if one has a clear edge over the other in producing two commodities. If each trading partner has a product that will fetch a higher price abroad than at home, they will have a comparative advantage. More commodities are created and both nations' income increases if one focuses on producing the products in which it has a comparative advantage.

The following assumptions were made in this study. First, all markets have perfect competition, implying that: (i) companies are price takers; (ii) companies select production levels by which the price is equal to the MC (p=MC); (c) output is uniform among all firms; (d) entry is free; and (e) firms are perfectly known. Second, labor is the single factor of production, homogeneous, and free to travel between industries but stationary between two countries. Third, only two countries engage in trade. Fourth, both countries manufacture just two item. Finally, there is no cost of transportation between countries. However, this theory was criticized on the

ground that the emphasis on labor costs is unrealistic. Labor and non-labor costs are included in the production costs. Similarly, trade processes involve financial costs rather than labor costs (Jhingan, 2006).

### 3.2 Empirical Review

In 2025, Ezuem and Sagbara conducted research on currency rates and foreign trade in Nigeria using the ARDL approach. Data were collated from World Bank and CBN annual statistics between 1981 and 2022. The results showed that the currency rate significantly and negatively influenced short-term trade. However, this variable has a favorable and noteworthy long-term impact on trade. GDP growth rate negatively and negligibly affected short-term exports while long-period trade negatively and negligibly impacted long-term trade. Within the short and long term, the inflation rate indicated a favorable but negligible influence on international commerce. Therefore, it was suggested that cautious measures should be adopted to curb fraud in foreign exchange transactions to improve the GDP growth rate and mitigate the short-term negative effects of exchange rates.

How the currency rate influenced Nigerian exports from 1983 to 2022 was assessed by David, Bognet, Akutson, Birat, Maisamari, and Sheyin (2024). The impact of the currency on exports was ascertained using data from the apex bank and ARDL technique. The results showed that the currency rate significantly boosts exports over the long and short terms. This means that exports will increase in response to an increase in the exchange rate. Hence, the government should increase external reserves, implement sound monetary policies, ensure responsible fiscal policies, draw in foreign investment, and promote exports by assisting local businesses to create and export high-quality goods that Nigeria has significant comparative and competitive benefits.

Adewale, Olopade, and Ogbaro (2024) used the FMOLS techniques to evaluate the nexus between exchange rates and Nigeria's direct investment over the period of 1981- 2021. The study found a strong positive connection between the rate of exchange and direct investment; however, the analysis discovered a statistically negligible positive correlation between trade openness and FDI. Although not statistically significant, the interest rate shows a negative association with FDI. The study demonstrated a large, significant, and inverse connection between FDI and human capital, signaling the significance of developing human capital in attracting foreign investment. Therefore, the study advised policymakers to exercise prudence while preventing potential currency rate depreciation, which would put off foreign investment. Additionally, implementing a comprehensive macroeconomic stability strategy may promote a favorable for foreign investment.

Bakle, Gosshit and Abimiku (2024) analyzed the nexus between exchange rate volatility and Nigeria's manufacturing sector export using ARDL as the estimation. Data were gathered from secondary sources from 1980 to 2021. From the results, the volatility in the currency rate has a long-term, significant, and beneficial effect on Nigeria's manufacturing sector exports. The study concluded that the manufacturing sector exports of Nigeria were significantly impacted by exchange rate volatility. Therefore, the government and decision-makers should develop policies that can stabilize the naira by reducing or eliminating the arbitrage between the official markets and the black markets.

Sule, Hakim, Tri Rahayu, Samudro, Putro, and Pamungkas (2023) examined how exchange rate affects Nigeria's exports between 2010 and 2021. The study was analyzed using multiple regression analysis. A modest but positive nexus exists between Nigeria's export value, foreign direct investment, and exchange rate. It was also found that a substantial and positive connection exists between FDI and export value in Nigeria. As reported by the analysis, inflation and export performance have a negative and negligible correlation. Thus, the government should put in place more targeted policies to encourage export promotion in Nigeria.

Ijirshar, Okpe, and Andohol (2022) covered the period between 1986 and 2021 to analyze how the exchange rate affects trade flow in Nigeria. This study employed both ARDL and NARDL as analytical techniques. Exchange rate had symmetrical influences on imports, exports, and trade balance. The results also revealed that

the depreciated real exchange rate exhibits the J-curve shape typology, having a significant short-term negative effect on exports and the trade balance, but a long-term beneficial impact. Furthermore, because the total import and export elasticity exceed unity, the analysis reports evidence of the Marshall-Lerner condition. Thus, long-term net trade growth is possible. The Nigerian government should provide investment incentives to local businesses to boost production and raise the standard of products.

Gbadebo, Ogbonna, and Igwe (2020) examined the effect of currency devaluation on Nigeria's non-oil exports. The time frame of the research was 1986–2018. This study captures the non-oil export (dependent variable), money supply (MS), exchange rate (EXR), and inflation rate (INFR) (explanatory variable). The OLS regression model was used to examine the short-term association between these variables. Additionally, the variables underwent Granger causality, Johansen co-integration, and unit root tests. According to the results, EXR had a large negative influence on non-oil exports, whereas MS had a significant positive impact. In Nigeria, INFR had a negative but negligible connection with the dependent variable, indicating that currency devaluation negatively impacted non-oil exports. The study recommended that the Nigerian government should either revalue its currency or prohibit the importation of some locally made goods to strengthen the home economy.

Nweke, Eze, and Atunna (2020) analyzed the impact of currency rate depreciation on Nigeria's export performance from 1981 to 2018 using ex-post facto study design. The ARDL model was employed in this study. Similarly, oil exports, non-oil exports, total exports, exchange rate, gross domestic product (GDP) and interest rate are among the variables examined in the study. The results showed that the exchange rate significantly and favorably influenced the performance of oil exports in the short and long terms, respectively. It also demonstrated that the exchange rate had a positive and negligible influence on the performance of non-oil exports in the short term, but the currency rate had a negative and negligible impact in the long term. Hence, since the policy of exchange rate depreciation encourages and accelerates oil exports and the country's overall export performance, the study advised the government to rely on it holistically to boost export performance.

Iwuoha and Awoke (2019) employed Johansen's co-integration approach and VECM to analyze time series data from 1975 to 2017 to investigate how the real exchange rate affects Nigeria's non-oil exports. After calculating the lag length, it was discovered that the variables were stationary at I (1), and co-integration was confirmed. The results showed a long-term correlation between interest rates, trade openness, real exchange rates, and non-oil exports. From the VECM's results, it was concluded that while interest rates had a beneficial effect on non-oil export, real exchange rates and trade openness had a negative impact. Thus, the study recommended that complete deregulation of currency rates should be sought, local industries should be protected from competition, and non-primary export promotion should be promoted.

Danmola, Wakili, and Oladipo (2013) examined the validity of the JJ-curve hypothesis in the Nigerian economy. They employed cointegration vector auto regression estimation, Granger causality, and variance decomposition to analyze the hypothesis from 1970 to 2013. The following variables were used: local income and demand for imports, local currency price paid by local importers' prices in oversea GDP, and trade balance imports and exports. Using the OLS technique, the study inferred that not long-term relationship existed between the variables under consideration. Using the Granger causality test, a short-term interaction was discovered between exchange rate devaluation and trade balance exist. This supports the J-curve hypothesis, which recommends that local currency devaluation has a bidirectional impact on trade balance in the short term but has minimal long-term effects, necessitating diversity.

Simon-Oke and Akibisal (2010) analyzed the impact of exchange rate deregulation on industrial performance in Nigeria. They employed secondary data between 1975 and 2005 and considered the co-integration technique

and chow breakpoint test as tools of analyses. Variables such as the terms of trade, industrial productivity growth rate, industrial production index, industrial output to GDP, and interest rate and exchange rate were analyzed using the error correction model (ECM) technique. The results showed a negative, long-term correlation between industrial performance and the exchange rate. This implies that Nigeria's long-term industrial performance is unaffected by currency rate deregulation.

## 4. METHODOLOGY

### 4.1 The theoretical framework

This study is underpinned by Keynesian Absorption, which explains an existing relationship between a country's trade balance and macroeconomic variables, such as exchange rate and country's output level. The theory asserts that the relationship among the variables is influenced by the appreciation and/or depreciation of a country's national currency

### 4.2 Data Type and Sources

The data for the study were secondary in nature. These are time series on Nigeria's money supply, trade balance, exchange rate, and inflation rate. While data on money supply, RGDP, and inflation rate were retrieved from the Central Bank of Nigeria's series of annual statistical publications, data on the balance of trade and exchange rate were obtained from the World Development Indicator.

### 4.3 Method of data analysis

This study examined the stationarity position of the data employed in the analysis using the Augmented Dickey-Fuller unit root test. Subsequently, the Granger causality model was fitted to ascertain the direction of causality among the study variables. Serial autocorrelation and heteroscedasticity diagnostic test were also run on the estimated coefficients of the variables.

### 4.4 Model Specification

The causality models estimated in the study are specified as follows:

Causality between exchange rate and external trade balance

$$\left.\begin{aligned} TB_t &= \beta_1 + \Sigma\, TB_{t-1} + \Sigma\, EXR_{t-1} + \mu_t \\ EXR_t &= \beta_2 + \Sigma\, EXR_{t-1} + \Sigma\, TB_{t-1} + \mu_t \end{aligned}\right\} \quad \text{Eq. (1)}$$

Causality between trade balance and inflation rate

$$\left.\begin{aligned} TB_t &= \alpha_1 + \Sigma\, TB_{t-1} + \Sigma\, IR_{t-1} + \mu_t \\ IR_{t=} &\alpha_1 + \Sigma\, IR_{t-1} + \Sigma\, TB_{t-1} + \mu_t \end{aligned}\right\} \quad \text{Eq. (2)}$$

Causality between trade balance and money supply

$$\left.\begin{aligned} TB_t &= \beta_3 + \Sigma\, TB_{t-1} + \Sigma\, MS_{t-1} + \mu_t \\ MS_t &= \beta_4 + \Sigma\, MS_{t-1} + \Sigma\, TB_{t-1} + \mu_t \end{aligned}\right\} \quad \text{Eq. (3)}$$

Where TB= trade balance (₦'billion); ER= exchange rate (₦/$); IR = inflation rate (percent); MS = money supply (₦'billion); RGDP = real gross domestic product (₦'billion); μt= Error Term; t= 1981-2023

## 5. RESULTS AND FINDINGS

### 4.1 Trend Analysis

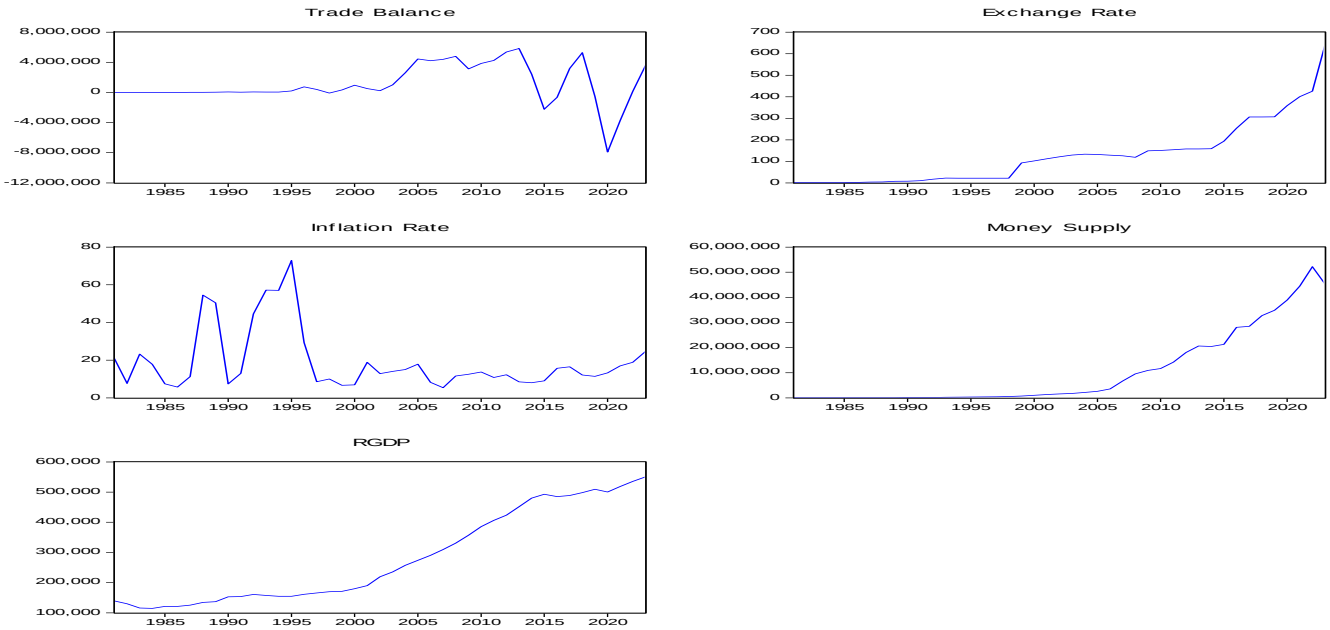


Figure 1: Variable Trends

As shown in Figure 1, historical data on trade balance inflation rate, exchange rate, money supply, trade balance, and real GDP revealed a steady movement between 1981 and 1995, indicating a favorable external trade position during the period. This extended beyond 2000 up to around 2015. During this period, Nigeria could be said to have enjoyed a trade surplus attributable to an increase in oil income. Regrettably, in 2015, Nigeria's balance of trade dropped to a deficit, which corresponds to a crash in global oil prices. However, the country experienced a spike between 2018 and 2019, before it later plunged again in the following year (World Bank, 2020). The exchange rate trend indicates that the Naira to dollar began to decline immediately after the Structural Adjustment Program (SAP) implementation in 1986 when the Naira depreciated to N2 to dollar (Adewale, et al., 2024). Since then, the naira has continued to experience a free fall against the dollar. Some scholars attributed the free fall to overreliance on a mono-economy and misapplication of exchange rate policies. In 2015, the naira depreciated widely to N193 due to the sudden drop in the international oil price.

The trend of inflation rate indicated periods of high inflation rate at 50 % in 1989, 57% in 1993, and 72% in 1995. The reasons for this spike from 1981 to 1986 to 1995 could be traced to the period when the SAP was promulgated with its attendant implication. This involved currency devaluation and removal of exchange rate subsidies that eventually led to a hike in the price of goods and services. Shortly after the 1995 spike, the inflation rate dropped to 10% and remained stable for the period. Despite maintaining a lower rate compared to the SAP period, there were still ups and downs in the rate. The CBN continued to implement several tight monetary policies, yet the inflation rate rose again between 2015 and 2016 to 15%, as evident in the recessionary period of the Nigerian economy. Since the COVID-19 pandemic in 2020, Nigeria has not achieved a single-digit inflation rate. Meanwhile, other factors are responsible for this high inflationary trend, such as import policies, exchange rate devaluations, subsidies removal, and many others, which affect the rise in the inflation rate.

The money supply is the total amount of money in circulation. The trend shows that it was lower before the SAP era. As part of the program's cardinal goal, it was to expand supply of money in circulation to boost productivity. From 1990, the money supply rose sharply to N111.11 billion against N20 billion circulating money during the Pre-SAP era. This showed the effectiveness of the monetary authority policy implementation and the government's fiscal policies. Between 2000 and 2015, the growth in the money supply increased to over

N1trillion. The RGDP trend was observed to steadily grow during the SAP period, reflecting the influence of policies such as currency devaluation and expansionary monetary policies. Furthermore, due to relatively stable political factors, the economy saw a significant increase in investment from domestic and foreign investors.

**4.2 Unit root test**

The stationarity positions of the variables were tested using the ADF method, and the results are shown in Table

**Table 1: Results of the Unit Root Test**

| Variable | Level | 1st Difference | Remark |
|---|---|---|---|
| TR_BAL | -3.4545 | - | I(0) |
| | (0.0609) | | |
| LEXC_RATE | -1.6540 | -5.7341 | I(1) |
| | (0.7358) | (0.0001) | |
| INFL_RATE | -4.0864 | - | I(0) |
| | (0.0133) | | |
| LM_SUPPLY | -0.4628 | -3.3833 | I(1) |
| | (0.9815) | (0.0680) | |
| RGDP | -2.2488 | -3.6262 | I(1) |
| | (0.4503) | (0.0398) | |

Source: Author's computation, 2025

Table 1 shows the results of the unit root test of all the variables used in the study analysis. The study relied on the augmented Dicker-Fuller criterion and reveled that trade balance and inflation rate were stationary at level I (0), while others were stationary at first difference I (1).

**4.2 Granger causality Analysis**

Results of the estimated Granger causality among key study variables are presented in Table 2. The interpretation of the result is also presented.

**Table 2: Causality test results**

| Null Hypothesis | Obs | F-statistics | P-value |
|---|---|---|---|
| LEXC_RATE does not Granger Cause TR_BAL | 41 | 1.12013 | 0.0373 |
| TR_BAL does not Granger Cause LEXC_RATE | | 0.72583 | 0.4909 |
| INFL_RATE does not Granger Cause TR_BAL | 41 | 0.46574 | 0.6314 |
| TR_BAL does not Granger Cause INFL_RATE | | 0.87603 | 0.4251 |
| LM_SUPPLY does not Granger Cause TR_BAL | 41 | 1.73318 | 0.0211 |
| TR_BAL does not Granger Cause LM_SUPPLY | | 0.87418 | 0.0159 |

Source: Author's Computation, 2025

The above table shows the Granger causality of the variables. It helps to determine whether two variables predict one another and to ascertain the causality direction. The table revealed that there is causality from the exchange rate to trade balance (P-value 0.0373). However, the trade balance does not affect exchange rate (P-value = 0.4909). Therefore, this is a unidirectional causality. Inflation rate and trade balance did not show any form of causality because their respective probability values are 0.6314 and 0.4251 respectively, which is more than 5% of significance. The relationship between money supply and trade balance is significant because their respective probability values of 0.0211 and 0.0159 are significant at the 5% critical value. While money supply

granger-cause trade balance, trade balance also granger-cause money supply. This implies that bidirectional causality exists between the two variables.

### 4.3 Diagnostic check

#### 4.3.1 Serial Correlation Test

A serial correlation test was conducted for the estimated variables. The results are presented in Table 3 below and discussed.

**Table 3: LM test of serial correlation**

| | | | |
|---|---|---|---|
| F-statistics | 2.159775 | Prob. F (4, 26) | 0.1018 |
| Obs* R-squared | 9.976125 | Prob. Chi-squared (4) | 0.0408 |

Source: Author's Computation, 2025 manuscript

The result presents an F-statistics of 2.1597 with a corresponding p-value of 0.1018. The estimate is not statistically significant. Therefore, the study accepts the null hypothesis of no serial correlation.

#### 4.3.2 Heteroscedasticit test

Heteroscedasticity test is performed to check if the variance of errors from the model output does not correlate with the independent variable values. This is presented in Table 4 below

**Table 4: Heteroskedasticity test results**

| | | | |
|---|---|---|---|
| F-statistics | 0.770819 | Prob. F (9, 30) | 0.6438 |
| Obs*R-squared | 7.512581 | Prob. Chi-Square (9) | 0.5839 |
| Scaled explained SS | 14.05551 | Prob. Chi-Square (9) | 0.1204 |

Source: Author's Computation, 2025

In the result table above, the F-statistics is 0.770819 with a corresponding p-value of 0.6438 is statistically insignificant. Therefore, the study cannot reject the null hypothesis of no heteroskedasticity.

## 6. DISCUSSION

Nigeria had a relatively stable trade balance in the early 1980s. Notable spikes started emanating between 2018 and 2019 and further slipped in 2020. This could be attributed to the COVID-19 pandemic, which led to the shutdown of the economy. The country also experienced vandalism and underinvestment in the oil sector during this period. Inherent continuous naira fluctuation coupled with persistent uncertainty was also observed. Between 2020 and 2023, the naira rate against the dollar experienced a staggering depreciation from N105 to N645 due to countless policies such as currency devaluation, overreliance on importation of goods, and removal of subsidies. Unlike in earlier years, economic growth experienced a steady increase. This result could be attributed to political stability. However, between 2015 and 2020, the economy was hit by a recession due to the high inflation rate and low crude oil prices coupled with the aftermath of the COVID-19 pandemic (World Bank, 2020). Government efforts to boost growth in the country were evident during the period, given the money supply increase policy through commercial banks to expand credit facilities to real sectors of the economy.

Given the established causality result, the exchange rate in Nigeria influences the trade balance position. This is also posited in Danmola et al (2013). A favorable exchange rate that presents the country's exports at relatively cheaper price to buyers tends to increase the trade balance. However, Nigeria may have to contend with the continuous Naira fluctuation, which may adversely impede the trade balance improvement. Increased money supply through monetary authorities has the potential to improve the balance of trade position. On the other hand, improved trade balance through higher trade trends to propel the country's money supply. This agrees with the bidirectional causality established between the money supply and the balance of trade in the study analysis.

## 7. CONCLUSION AND RECOMMENDATIONS

This study examined the causal relationship between the exchange rate and Nigeria's external trade balance for a 43-year from 1981 to 2023. The exchange rate was established to influence trade balance despite its fluctuation and persistent uncertainty. Money supply and trade balance also influenced each other.

Based on the findings, the study recommends the following;

i. Nigeria must implement timely monetary policy intervention. This will help track exchange rate movements, thus mitigating the effects of the adverse balance of trade

ii. Promotion of policies to improve trade logistics to enhance a resilient trade balance without necessarily devaluing the Naira.

iii. The government should encourage businesses to adopt hedging strategies that immunizes them against exchange rate volatility. This will ensure better risk management by businesses.

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