

Currency Devaluation and Nigeria's Trade BalanceOzulem Elvis Wokekoro¹, Rosemary Chioma Ewubare Dennis², and Chukwuma Ogbonna Ogbodo³Department of Economics, Rivers State University, Port Harcourt^{1, 2, &3}elvizwokz@gmail.com¹, Rozidennis12@gmail.com², and chuksogbodo@gmail.com³**Abstract**

The study examines the currency devaluation and trade balance in Nigeria between the periods of 1990–2022. The study conducted pre-estimation test of unit root test, cointegration, and ARDL error correction model while the post-estimation analysis of serial autocorrelation, heteroskedasticity test, and CUSUM test. The study found that CUD has a negative but significant impact on BOT while foreign reserves has positive and significant relationship with BOT. The study concludes that measures targeted at improving foreign reserves and reducing inflation will improve the balance of trade in Nigeria. Besides, the currency devaluation has not had the intended result in Nigeria. It recommends that currency devaluation policies must be combined with other key policies to have the required effect on the economy.

Keywords: Devaluation, Currency, Balance of Trade, Inflation, Foreign Reserves

Introduction

Currency devaluation, a deliberate downward adjustment of a country's exchange rate relative to other currencies, has become a frequent tool in economic policy, particularly in developing economies like Nigeria (Adeyemi et al., 2013). Devaluation aims to make a country's exports more competitive while making imports costlier to improve the trade balance. For Nigeria, an oil-dependent economy, currency devaluation has been both a policy necessity and a recurring challenge, given the volatile nature of oil prices and their impact on foreign exchange earnings (Adeyemi et al., 2020).

Since the introduction of the Structural Adjustment Program (SAP) in 1986, Nigeria has repeatedly resorted to devaluing the naira to address external imbalances and fiscal deficits. However, these devaluations have often been met with unintended consequences, such as spiraling inflation, rising poverty, and exacerbation of trade imbalances due to Nigeria's high dependence on imported goods and services (BigBen, 2020).

Foreign exchange plays a pivotal role in any economy, as its rate reflects the economic strength of a nation as stated by (Anoke et al., 2016). Consequently, its management is entrusted to highly skilled professionals and technocrats, typically within the central monetary authority, such as the Central Bank. The level of foreign exchange in a country often mirrors its economic development trajectory (Loto, 2011).

Jhingan (1997) defines the exchange rate as the price at which one currency is exchanged for another. This conceptualization underscores the exchange rate as the cost of one currency in terms of another. For example, the exchange rate between the naira and the dollar indicates the amount of naira needed to purchase a dollar. Similarly, Obaseki (1993) asserts that a currency's exchange rate reflects the value of the domestic economy relative to another, providing a measure of its external worth and linking domestic and foreign prices of goods and services.

Inuwa, et al. (2024) maintains that foreign currencies are essential for international transactions, including payments for goods and services, as well as interest on loans used for investments. Nigeria's demand for foreign currencies such as the US dollar, British pound, French franc, and Japanese yen stems primarily from its need to purchase goods and services from these countries. Conversely, the supply of foreign currencies is generated by Nigeria's exports to these trading

partners. Under a flexible exchange rate system, the rate is determined by market forces, with demand for foreign currency increasing as imports grow, and supply rising with higher export levels (Loto, 2011).

Changes in domestic price levels also affect exchange rates. A rise in internal prices makes imports relatively cheaper, increasing demand for foreign currency without a corresponding rise in supply, leading to depreciation of the domestic currency. However, if prices rise globally, the effects on exchange rates may offset each other. The extent to which a country prioritizes its currency value relative to others depends on its level of economic self-reliance. Economies with significant internal trade may prioritize the internal value of their currency more than external exchange rates (Obaseki, 2001).

A fixed exchange rate system involves pegging the domestic currency to a standard such as gold, a single foreign currency, or a basket of currencies (Salasevicius & Vaicius, 2003). The primary goal is to maintain low inflation levels while offering benefits like reduced trade transaction costs, enhanced macroeconomic discipline, and increased credibility through exchange rate stability. However, fixed regimes limit monetary policy independence, as adjustments to exchange rates are not discretionary (Abolaji, 2014).

In contrast, a floating exchange rate system relies on market forces to determine currency values, allowing the exchange rate to adjust automatically to address market imbalances. Under this regime, changes in foreign exchange demand and supply can influence exchange rates without directly affecting a country's international reserves. This system provides monetary authorities greater flexibility in formulating policies, as the exchange rate acts as a buffer against external shocks, enabling autonomous management of monetary policy (Aiya, 2004).

The interplay between devaluation and macroeconomic indicators such as trade balance and inflation remain a critical area of concern. While proponents argue that devaluation can stimulate export growth and reduce trade deficits, critics highlight the inflationary pressures it creates, especially in import-dependent economies like Nigeria. Understanding the dynamics of currency devaluation within Nigeria's economic framework is vital for crafting effective policy responses.

Despite multiple rounds of currency devaluation, Nigeria continues to grapple with trade imbalances and rising inflation rates as pointed out by (Akindiyo & Olawole, 2015). The paradox lies in the dual effect of devaluation: while it is expected to boost exports and improve the trade balance, the country's reliance on imported goods often negates these benefits by increasing production costs and consumer prices. This dependency limits the ability of devaluation to yield the desired economic outcomes. Moreover, Nigeria's trade balance remains skewed toward crude oil exports, which constitute over 90% of total exports. Non-oil sectors have failed to capitalize on devaluation opportunities due to structural weaknesses, infrastructural deficits, inadequate diversification policies, and massive corruption in the channels of exportation. Simultaneously, inflationary pressures from devaluation disproportionately affect low-income households, worsening economic inequality and poverty levels in the country (Ali, 2020). The inadequacy of fiscal and monetary policies to mitigate these challenges raises critical questions about the effectiveness of devaluation as a policy tool. This study explores the complex relationship between currency devaluation, trade balance, and inflation in Nigeria, aiming to provide actionable insights for policymakers.

Literature Review

Theoretical Review

Currency devaluations impacts on trade balance and inflation are rooted in several economic theories that elucidate the mechanics of exchange rate adjustments. Some of these theories include:

Elasticity Approach to Balance of Payments

According to Amah, (2020), the elasticity approach posits that currency devaluation improves the trade balance if the combined price elasticity of demand for exports and imports exceeds unity (Marshall-Lerner condition). A weaker currency makes exports cheaper for foreign buyers and imports more expensive for domestic consumers, potentially reducing trade deficits. However, Nigeria's import dependency, particularly on essential goods and production inputs, challenges this model's applicability. This approach, attributed to Robinson (Benson & Victor, 2012) and Meltzler (1948), and later popularized (Gbadebo et al., 2020), suggest that contractual transactions completed at the time of devaluation or depreciation may dominate short-term trade dynamics, leading to an initial deterioration in the trade balance. However, over the long term, as the price elasticities of exports and imports increase, the quantity of exports demanded rises while imports decline, resulting in an eventual improvement in the trade balance after a considerable lag-a phenomenon known as the *J-curve effect* (Imimole & Enoma, 2011). Empirical findings on the J-curve hypothesis have been mixed, exhibiting both positive and negative outcomes.

Purchasing Power Parity (PPP)

PPP theory states that exchange rates adjust to equalize price levels between countries (Adekoya & Fagbohun, 2016). Loto (2018) insists that over the long term, currency devaluation should restore competitiveness without permanently impacting inflation. However, Nigeria's structural issues and external shocks, such as oil price volatility, disrupt this equilibrium, making it worse for devaluation policies to achieve the desired results.

Empirical Review

Oyinlola et al. (2013) investigated the long-term and short-term effects of exchange rate and price fluctuations on Nigeria's trade flows by analyzing export and import functions. They applied the Autoregressive Distributed Lag (ARDL) bounds testing approach to cointegration, utilizing quarterly data from the first quarter of 1980 to the fourth quarter of 2007. In contrast, this study employs annual time series data, differing from their quarterly data approach.

Adeyemi et al. (2013) examined the impact of currency devaluation on Nigeria's trade balance using Johansen cointegration and variance decomposition analyses over the period from 1970 to 2010. Their model incorporated variables such as domestic income, domestic and foreign money supply, domestic interest rates, and nominal exchange rates. However, the absence of a trade balance variable in their model raises questions about the comprehensiveness of their analysis.

Yasmina (2012) assessed the effects of the Real Effective Exchange Rate (REER) on Algeria's trade balance, considering variables like REER, foreign income (y), and real domestic income (Y). She employed unit root tests, cointegration techniques, the Error Correction Model (ECM), and impulse response functions, using time series data spanning from the first quarter of 1981 to the fourth quarter of 2009. However, the exclusion of export and import variables in her trade balance analysis may lead to unrealistic estimations.

Anoke et al. (2016) in their study on the impact of exchange rate depreciation on Nigeria's trade balance between 1986 and 2014 using econometric tools such as the Cointegration Test, Vector Error Correction Model (VECM), Wald Test, and Granger Causality Test, found that there is a long-run equilibrium relationship between exchange rate depreciation and trade balance in

Nigeria. Again, exchange rate depreciation was found to have no significant effect on the trade balance. The study concluded that currency depreciation does not improve Nigeria's trade balance in the short run, as it tends to benefit economies that are export-oriented. In contrast, import-dependent economies like Nigeria struggle to derive significant benefits from currency depreciation. The study recommended that to maintain the long-run relationship between the balance of trade (BOT) and other explanatory variables such as exchange rate (EXR) and foreign direct investment (FDI), policymakers should implement strategies to diversify foreign exchange sources in Nigeria, ensuring a sustainable positive relationship over time.

Adeyemi et al. (2020) investigated the relationship between currency depreciation, money demand, and trade balance in Nigeria from 1986 to 2018. It employs secondary annual time series data spanning 1986 to 2017, sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin. The descriptive statistical analysis revealed that currency depreciation followed a procyclical pattern, influenced by varying foreign exchange and exchange rate policies implemented by different administrations. The data also highlighted structural breaks and occasional spikes in the trends of currency depreciation and trade balance, suggesting that trade balance responded positively to currency depreciation. The study concludes that the depreciation of the naira relative to foreign currencies, coupled with money demand dynamics, has a positive effect on Nigeria's trade balance. Based on these findings, it recommends that the government implement policies aimed at boosting export activities and improving access to credit for the real sector to stimulate sustained economic growth.

Inuwa et al. (2020) examined the impact of naira devaluation on Nigeria's balance of trade using time series data from 1986 to 2017. It explores both the short-run and long-run equilibrium relationships between currency devaluation and trade balance during the study period. The analysis employs techniques such as unrestricted Vector Auto Regression (VAR), Granger causality, cointegration, and Vector Error Correction Mechanism (VECM). Additionally, the impulse response function and variance decomposition methods are applied to further understand the dynamics among the variables. The variables analyzed include currency devaluation (CDV), export rate (EXPT), import rate (IMPT), and trade balance, which were found to be integrated of order one ($I(1)$), while interest rate (INTR) was found to be stationary at level ($I(0)$). The results indicate a unidirectional causality from naira devaluation to export rate and interest rate. The VAR cointegration test confirms the presence of a long-run equilibrium relationship among the variables, with the error correction term correctly signed and statistically significant. The impulse response and variance decomposition results reveal both positive and negative shocks from naira devaluation affecting trade balance, export rate, import rate, and currency devaluation, based on past and current values. These findings suggest that naira devaluation has a positive and significant impact on Nigeria's trade balance. The study recommends that the government should focus on improving indigenous innovation to meet international standards, reducing dependence on imports, and promoting the production of competitive goods and services. Since devaluation makes exports cheaper, Nigeria is encouraged to enhance the quality and volume of its exportable goods to achieve a favorable trade balance and stimulate economic growth.

Mamun et al. (2020) evaluated the impact of Turkish lira misalignment on Turkey's economic growth, using the Johansen cointegration technique and the ARDL approach to analyze data from 1980 to 2016. The study identifies key determinants of Turkey's equilibrium real effective exchange rate (REER), such as terms of trade, relative productivity, net foreign assets, investment, and trade openness. Results indicate significant currency misalignment, with higher misalignment negatively affecting economic growth.

Adekoya and Fagbohun (2016) investigated the effects of currency devaluation on manufacturing output growth in Nigeria from 1980 to 2014. Using techniques such as the Augmented Dickey-Fuller test for stationarity, Engle-Granger cointegration for long-run relationships, and ordinary least squares (OLS) for estimates, the study finds a long-run relationship among the variables. The results reveal that, except for imports, other variables positively affect manufacturing output growth.

Omojomite and Akpokodje (2010) assessed the effects of exchange rate reforms on Nigeria's trade performance from 1986 to 2007. The study highlights the limited impact of exchange rate reforms on diversifying exports from oil to non-oil products and reducing consumer goods imports. Despite some positive effects on non-oil exports, exchange rate reforms stimulated imports, albeit insignificantly.

Oyinlola et al. (2010) explored the long-run effects of exchange rate and price changes on Nigeria's trade flows using exports and imports functions with quarterly data from 1980Q1 to 2007Q4. Employing the ARDL bounds testing approach, the study finds that trade flows in the short run are significantly influenced by relative prices, income levels, nominal exchange rates, and external reserves. In the long run, devaluation is more effective than relative prices in altering import demand, while the reverse is observed for export demand.

Gaps in Literature

Existing studies provide valuable insights but leave several gaps. There is limited exploration of the simultaneous impact of devaluation on trade balance and inflation, particularly in Nigeria's context. Further, there is inadequate attention to the role of foreign reserves and devaluation on the trade balance in Nigeria. This study intends to analyse these variables, pointing out how they significantly impact on the trade balance of Nigeria over the period.

Methodology

The study employs an ex post facto research design, the model is specified, thus:

$$BOT = f(CUD, INF, FOR) \quad (1)$$

$$BOT = a_0 + a_1CUD - a_2INF + a_3FOR + e_1 \quad (2)$$

Where:

BOT = the balance of trade representing the difference between the imports and exports in Nigeria;

CUD = the Currency devaluation using the annual Dollar official exchange rate,

FOR = the foreign exchange reserve,

e_1 = the error term,

a_1 - a_3 = the coefficient of inflationary; pressures measuring the slopes,

a_0 = intercept parameter estimate.

The data were sourced from the National Bureau of Statistics, and the Central Bank of Nigeria (CBN) statistical bulletins—are secondary and cover a twenty-two-year period from 1990 to 2022. Annual time series data was analyzed using the Error Correction Model (ECM). The ECM helped to provide insights into the speed of adjustment, indicating the rate at which disequilibrium from the previous period adjusts toward the equilibrium path each year.

Data Analysis and Results

The research employs the use of time series data for a period of 22 years ranging from 1990-2022.

Table 1 Unit Root

Variables	At levels (Prob)	First difference (Prob)	Comments
LogBOT	0.0250	0.0048	I(0) Stationary at levels
LogINF	0.1429	0.0010	I(1) Stationary at first difference
LogCUD	0.4717	0.0000	I(1) Stationary at first difference
LogFOR	0.2200	0.0021	I(1) Stationary at first difference

Source: Author's Computation (2024)

The unit root tests show that the variables are stationary at both levels and first difference. This suggests that the use of Autoregressive Distributed Lag Model (ARDL) is the most appropriate model and analytical procedure for the analysis. who also used the ARDL for the analysis due to the mixture of both the levels and first difference in the unit root analysis. The bounds test for cointegration tests for long term relationship between the dependent and the independent variables used in the study).

Table 2: Bounds test for Cointegration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	11.29554	10%	3.47	4.45
K	3	5%	4.01	5.07
		2.5%	4.52	5.62
		1%	5.17	6.36

Source: Authors computation from E views, 2024

The bounds test for cointegration for the model examined showed that the model has long-term relationships amongst the variables used. Using their F-stat at 5% confidence interval, all the models revealed that the F-statistics are higher than their 5% assumptotic variables, indicating that there is a long run relationship amongst the variables used in the models.

Table 3 ARDL ECM Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.303465	1.298958	2.543165	0.0198
@TREND	-0.006789	0.009295	-0.730428	0.4740
D(LOG_CUD_(-1))	-0.246640	0.185801	-1.327444	0.0001
D(LOG_INF_(-1))	-0.376093	0.178201	-2.110496	0.0483
D(LOG_FOR_(-1))	0.732113	0.231223	3.166263	0.0000
CointEq(-1)*	-0.178239	0.081623	-2.183681	0.0417
R-squared	0.658675	Mean dependent var		0.122236
Adjusted R-squared	0.560252	S.D. dependent var		0.316059
S.E. of regression	0.252798	Akaike info criterion		0.253121
Sum squared resid	1.405946	Schwarz criterion		0.493091

Log likelihood	1.582870	Hannan-Quinn criter.	0.324476
F-statistic	4.660258	Durbin-Watson stat	1.865558
Prob(F-statistic)	0.007071		

Source: Author's Computation using E-view (2024)

The ARDL ECM results of the models shows the relationships between the dependent and the independent variables over the period. The result reveals that the R-square, which shows the goodness-of-fit, is 65.8%. This shows that 65.8% of the changes in the dependent variables are caused by the changes in the independent variables. The f-test also shows that the model, taken as a whole, is statistically significant. This implies that the model is reliable for the current analysis. The model equally shows that the error correction mechanism (ECM) is -17.8%. This implies that there is 17.8% annual speed of adjustment of the variables to equilibrium.

Table 4 Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.001220	Prob. F(2,33)	0.1512
Obs*R-squared	4.434844	Prob. Chi-Square(2)	0.1089

Source: Author's computation using E-views, 2024

The serial correlation helps to understand how (and if) a variable affects itself when lagged. The implication is that if a variable affects itself over time, this will result to spurious results and cannot be used for predictive purposes (Schork, 2022). The serial correlation results for the model reveals that there is no issue of serial correlation among the variables used. This is shown by the probability of the F-stat being more than 0.05.

Table 5 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.302349	Prob. F(7,19)	0.3019
Obs*R-squared	8.754450	Prob. Chi-Square(7)	0.2708
Scaled explained SS	4.276486	Prob. Chi-Square(7)	0.7474

Source: Author's computation using Eviews, 2024

The heteroskedasticity test reveals the variability of the variance or error term of the time series over the period. As one of the assumptions of regression analysis, heteroskedasticity shows that the error terms of the variables are not the same (and cannot be) if the analysis will be reliable (Daryanto, 2020). As the results shows, the probabilities of the f-stat are greater than 0.05. This shows that there is no reason to believe that the variables are homoskedastic.

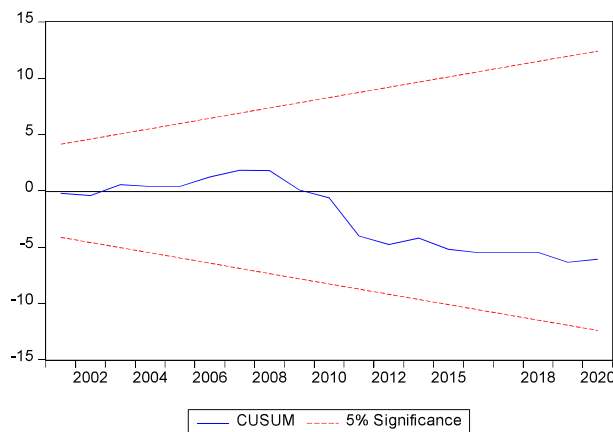


Fig.1 CUSUM Test

CUSUM test reveals the stability of the model and its applicability in the analysis. All the models reveal that the models are stable and therefore, applicable in the current analysis. The analysis shows that there is a negative relationship between BOT and CUD, which is not expected a priori. The result shows that as CUD increases by a unit, BOT decreases by -0.246640 and vice versa. The analysis reveals that CUD is statistically significant as shown by the t-value prob (0.0000). We will therefore accept the alternative hypothesis, reject the null and conclude that there is a significant relationship between BOT and CUD over the period. Furthermore, the analysis shows that there is a negative relationship between INF and BOT. The result reveals that as INF increases by a unit, BOT decreases by -0.376093 and vice versa. The analysis reveals that INF is statistically significant as shown by the t-value prob (0.0483). We will therefore reject the null hypothesis, accept the alternative and conclude that there is a significant relationship between BOT and INF over the period. The analysis shows that there is a positive relationship between BOT and FOR over the period. The result shows that as FOR increases by a unit, BOT also increases by 0.732113 and vice versa. The analysis reveals that FOR is statistically insignificant as shown by the t-value prob (0.0000). We will therefore accept the null hypothesis, reject the alternative and conclude that there is no significant relationship between BOT and FOR over the period.

Discussion of Findings

The results of the analysis reveal that balance of trade has been worsening over the years, suggesting the crippling impact of currency devaluation of the exports. Various authors have researched on the performance of exchange rate and its impact on the balance of trade in Nigeria and their research findings have shown the importance of sound fiscal and monetary policies efficiently manage the impact of currency devaluation on the trade balance in Nigeria. The research reveals that inflation, currency devaluation, and foreign reserves have significant relationship with BOT. This implies that CUD, INF worsen the balance of trade as they increase and vice versa. This equally indicates that BOT is inversely proportional to the changes in the country's foreign exchange volatility. The findings also imply that the Nigerian economy relies more on imported goods than they produce or export. This agrees with the findings of Omojomite & Akpokodje (2010) who assess the effects of exchange rate reforms on Nigeria's trade performance from 1986 to 2007.

Again, the study found a negative and significant relationship between inflation rate and BOT. The study shows that inflation rate depreciates the value of the local currency, thereby worsening the BOT. Although the reduction in the value of the local currency is supposed to improve the export base of the economy, the study found that the export base does not improve. This indicates that the economy does not have more in her export basket. To boost the BOT, inflation rate must be controlled since the economy depends more on imported goods and services. The findings agree with the findings of Mamun et al. (2020), Adeyemi et al (2020), and Inuwa et al. (2020) who found that inflation rate negatively affects balance of trade in an economy that is import dependent like Nigeria.

Finally, the study reveals that foreign reserves positively affect balance of trade over the period. With a percentage increase in the foreign reserves, BOT increases by a percentage and vice versa. The foreign reserves suggest that the country has foreign currencies saved for the "rainy day." This can cover a period of importation. The relationship between foreign reserves and balance of trade suggests that foreign reserves can be used to improve the trade balance over a period of time. Effective and efficient use of foreign reserves for import substitution purposes will improve the balance of trade of the economy.

Conclusion and Recommendations

The study concludes that currency devaluation has a significant influence on trade balance in Nigeria, affecting the importation of goods and services while increasing the balance of trade deficit in the long-term.

The ARDL model reveals that while currency devaluation, foreign reserves, and inflation rate can significantly affect the BOT and the well-being of the economy. In the case of Nigeria, long-term results indicate that currency devaluation impact negatively on the balance of trade in Nigeria due to the over dependency on imported goods, which subjects the economy to external price shocks and exchange rate fluctuations.

The study concludes that currency devaluation has a deep and devastating effect on the health of the economy if not controlled. Moreover, it becomes worrisome when inflation and currency devaluation are allowed to float without having concrete policy measures to ensure they are not abused by opportunists.

More so, the study highlights the limitations of relying on devaluation policies without concurrent support for local production, manufacturing growth, and employment programs that will ensure local substitution of imported goods. Equally, the exportation process has been fraught with corruption, making it costlier for small-scale businesses to easily export their goods and services.

Based on this, the research recommends that currency devaluation policies must be combined with other key policies to have the required effect on the economy. This combination of policies such as boosting the manufacturing sector, improving the exportation process, etc., must be in place for currency devaluation to be effective. In the absence of such, the currency devaluation will result to increased prices of goods and services, impacting negatively to the balance of trade and general economic growth.

Also, the research recommends that policies targeted at inflation rates must be pursued for specific economic purposes of investments stimulation or slowing it down. It should also be sector specific and not generalized by the policymakers. The right mix of fiscal and monetary policies should be established to fight inflation as it negatively affects the balance of trade.

Finally, the study recommends that measures to improve the foreign reserves should be pursued as this is shown to have positive and significant impact on currency devaluation over the period and at the same time, decrease measures that deplete the foreign exchange reserves. Measures such as improve foreign exchange earnings through FDI, remittances, and so on. These will continually add to the foreign reserve while balance of trade deficit, external borrowings, and worsening inflationary pressures can lead to a steep depletion of foreign exchange reserves.

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