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Asymmetric Effects of Exchange Rate on Trade Flows in Nigeria

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ABSTRACT

Exchange rate plays a crucial role in determining trade flows, especially in developing nations like Nigeria where changes in exchange rates can have a big impact on the price of imports and the competitiveness of exports. Exchange rates have fluctuated often and persistently in the Nigerian economy in recent years, primarily due to changes in policy, global economic shocks, and changes in the price of oil. This study assessed the asymmetric effect of exchange rate on trade flows in Nigeria. Specifically, the study examined the effect of nominal effective exchange rate and real effective exchange rate on total trades in Nigeria. The study adopted ex-post facto research design and data were sourced using secondary means. This data was generated from the Central Bank of Nigeria Statistical Bulletin 2023. The study examined the descriptive statistics of the data for the variables, after which the series were tested for the presence of the unit root using the ADF unit root test. The Ordinary Least Square (OLS) procedure of analysis was used to estimate the model with the aid of computer statistical application (E-view 10). Findings revealed that there is a significant relationship between nominal effective exchange rate, real effective exchange rate and trade flows in Nigeria. Based on the findings, the study recommended that the Nigerian government and Central Bank should implement policies that are aimed at stabilizing the exchange rate to reduce fluctuations in exchange rate, which negatively affects trade flows.

Key Words: Asymmetric, Exchange Rate, Exports, Imports, Trade Flows

1.0 INTRODUCTION

Trade is an important engine of integration that transmits economic disturbances between nations. The lingering effect of the Global Financial Crisis and the slow recovery of most industrialised and emerging economies has weakened global

trade and affected global demand particularly for commodity exports. The process of globalization has also reduced the importance of national boundaries, leading to increased economic integration and international trade (Khan et al., 2021). Exchange rates facilitate international trade by making imports and exports efficient, while also serving as a means of transmitting funds between nations. However, fluctuations in exchange rates can create uncertainty in foreign trade, leading to speculation and disruptions in resource allocation, prices, and output levels (DeSoyres et al., 2019). To maintain an efficient exchange rate, the central bank of a nation intervenes in the foreign exchange market by injecting foreign exchange reserves when the exchange rate goes against the country's interest (Khan et al., 2021).

In Africa, exchange rate has been identified as a significant determinant of trade performance. The continent's economies are largely dependent on primary commodity exports, making them vulnerable to external shocks and currency fluctuations. According to Adegbite and Adetunji (2021), exchange rate negatively affects trade volumes in sub-Saharan Africa, with the impact being more pronounced for intra-African trade compared to trade with non-African partners. This is attributed to the limited use of hedging instruments and the underdeveloped financial markets in the region. Furthermore, the asymmetric effects of exchange rate are evident in Africa. For instance, studies have found that exchange rate depreciations often fail to boost exports as expected due to structural bottlenecks, such as poor infrastructure, high transaction costs, and limited export diversification (Ndikumana, 2019). Conversely, appreciations tend to increase the cost of imports, further exacerbating trade imbalances. These findings highlight the importance of accounting for asymmetric effects when analyzing exchange rate 's impact on trade in African economies.

In Nigeria, since the adoption of the Structural Adjustment Programme (SAP) in 1986, the Nigerian currency (Naira) has depreciated drastically and has become more volatile and several institutional framework and management strategies have been practiced in a bid to achieve exchange rate stability and policy; from the Second tier Foreign Exchange Market (SFEM) to the fully liberalised Foreign Exchange Market (FEM). Following continued and instability over exchange rates, more policies were introduced. These include the Autonomous Foreign Exchange Market (AFEM), Inter-bank Foreign Exchange Market (IFEM), Dutch Auction System (DAS), the Wholesale Dutch Auction System (WDAS) and the Retail Dutch Auction System (RDAS) (Dogo & Aras, 2021)

Nigeria transacts with different countries and uses foreign currencies requiring exchange rates. The exchange rate is seen as the current market price for which one national currency can be exchanged for another (CBN, 2016). The significance of the exchange rate on trade flow is that the price systems of two different countries are involved in such a way that the international transactions of goods and services are directly compared. Therefore, exchange rate management is crucial for any developing country mainly because it connects the domestic and global markets for goods and

services to a relative price and highlights the competitiveness of the country's exchange power over the rest of the world (Williamson, 2024). Thus, to manage the exchange rate effectively and explore the benefits therein, the monetary authorities make policies that affect the exchange rate. Changes in the exchange rate have a ripple impact on various economic variables, such as trade flows, interest rates, imports, exports, inflation, unemployment, and money supply (Oladipupo & Onotaniyohuwo, 2021).

Asymmetric effects of exchange rate refer to the unequal or differing impacts that exchange rate fluctuations can have on trade flows, depending on whether the currency is appreciating or depreciating (Ijirshar et al., 2022). In Nigeria, this concept is critical because exchange rate movements do not always produce symmetrical effects on trade. For instance, a depreciation of the naira may initially lead to an increase in export volumes by making Nigerian goods cheaper for foreign buyers, while simultaneously worsening the trade balance in the short term due to higher import costs. Conversely, an appreciation may discourage exports by making Nigerian goods more expensive on the international market, but it could stimulate imports due to the decreased cost of foreign goods (Loto, 2021). This asymmetry is observed in the J-curve effect, where trade performance deteriorates before improving after a currency depreciation, and is further influenced by factors such as global demand, the nature of exports (e.g., oil vs. agricultural products), and the degree of exchange rate (Ijirshar et al., 2022).

Since the introduction of floating exchange rate regime under the Structural Adjustment Programme (SAP) in 1986, the Nigerian currency (Naira) has depreciated drastically and has become more volatile. Recently, Nigeria's trade flow has declined with a trade surplus of ₦2.937 billion in 1986 and trade deficits in 1998, 2015, 2016, and between 2019 and 2020 (Central Bank of Nigeria, 2020). It is unknown whether the downwards spiral witnessed in trade flow in Nigeria, especially in recent times, is caused by exchange rate changes.

The persistent fluctuations in exchange rates have become a major concern for policymakers and stakeholders in the trade sector. These fluctuations, represented by nominal effective exchange rate (NEER) and real effective exchange rate (REER), create significant uncertainty for businesses involved in international trade. As Nigeria's economy is heavily reliant on crude oil exports and the importation of manufactured goods, exchange rate poses a dual challenge by affecting export revenues and increasing the cost of imports (Eze & Okoro, 2022). Previous studies have identified the asymmetric effect of exchange rate on trade flows in Nigeria (Apanisile & Oloba, 2020; Okaro, 2017; Adeniyi et al., 2011), however, these studies did not account for nominal effective exchange rate and real effective exchange rate as proxies for exchange rate in Nigeria. It is due to this paucity in research that this study investigate the asymmetric effects of exchange rate fluctuations on trade flows in Nigeria.

The objective of this study was to;

1. evaluate the effect of nominal effective exchange rate on trade flows in Nigeria
2. investigate the effect of real effective exchange rate on trade flows in Nigeria

The hypotheses of the study are;

H_{01}: Nominal effective exchange rate has no significant effect on trade flows in Nigeria.

H_{02}: Real effective exchange rate has no significant effect on trade flows in Nigeria.

2.0 LITERATURE REVIEW

2.1 CONCEPTUAL REVIEW

a. Exchange Rate

Exchange rate is the price of one country's currency expressed in terms of some other currency. It determines the relative prices of domestic and foreign goods, as well as the strength of external sector participation in the international trade (Maitra & Raychaudhuri, 2020). Exchange rate regime and interest rate remain important issues of discourse in the International finance as well as in developing nations, with more economies embracing trade liberalization as a requisite for economic growth (Yakub et al 2019). Nigeria currency is witnessing a state of increased depreciation and these is due to either our overreliance on oil thereby leaving other resources fallow, in this case the Apex bank has been left with no other choice than to use the foreign reserve to augment and stabilize the exchange rate (Akinlo & Apanisile, 2019). Nigeria's economy is highly dependent on oil exports and hence fluctuations in global oil prices can have profound impact on foreign exchange reserves, exchange rates and the overall economy. A drop on oil prices can lead to fiscal deficits and currency depreciation. Nigeria has been struggling with the effects of vital global shocks of 2014 namely; The United States (U.S) normalization of monetary policy, the slow-down in global growth rate and world trading routes geopolitical tensions as well the decline of the crude oil price by 70 percent that supported the country's foreign exchange reserves (World bank, 2021).

b. Trade Flows

Trade flows involves the exchange of goods and services across international borders, are fundamental to global economic dynamics. They are typically quantified by assessing a nation's exports and imports, with the balance between these two metrics indicating a trade surplus or deficit. A trade surplus occurs when exports surpass imports, while a trade deficit arises when imports exceed exports. These flows are influenced by various factors, including trade policies, exchange rates, and the quality of trade-related infrastructure. Recent studies have shown the significant impact of trade flows on economic growth. For instance, Magaji and Abubakar (2023)

found that trade openness positively affects Nigeria's real gross domestic product (GDP), suggesting that increased integration into the global market can enhance economic performance. However, the same study noted that Nigeria's trade balance did not have a significant impact on economic growth, highlighting the complexity of trade dynamics in the country (Magaji & Abubakar, 2023).

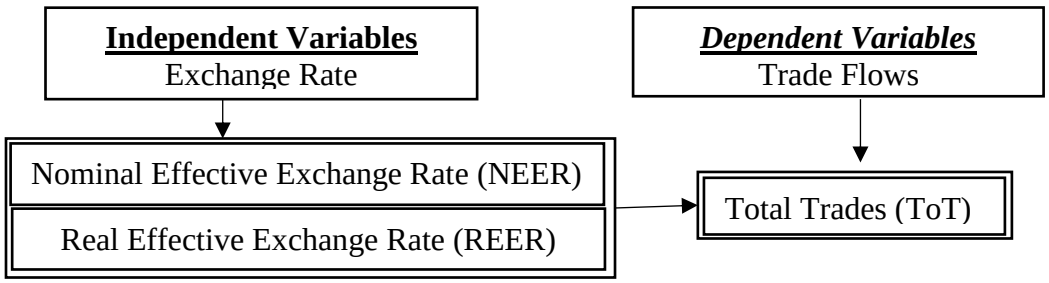
c. Asymmetric Effects of Exchange Rate on Trade Flows

In Nigeria, the asymmetric effects of exchange rate are compounded by the dual exchange rate system and the heavy reliance on oil exports. Studies have shown that exchange rate depreciation can lead to improved trade balances by making exports cheaper and more competitive globally, but only after an initial adjustment period marked by rising import costs, a phenomenon often described as the J-curve effect (Ijirshar et al., 2022). On the other hand, appreciation tends to dampen export competitiveness while encouraging imports, which can exacerbate trade deficits in the long term. Empirical evidence further highlights the importance of sectoral dynamics in shaping the asymmetric effects of exchange rate. For instance, oil exports in Nigeria exhibit less sensitivity to exchange rate changes due to the global pricing of crude oil in U.S. dollars. However, non-oil exports, such as agricultural goods, are more vulnerable to exchange rate fluctuations, making them critical to understanding the broader trade impacts of exchange rate (Adeniran et al., 2023).

d. Conceptual Framework

The diagram in Figure 1 below illustrates the conceptual framework of this study, depicting the interconnections and the sequential influence of the study's constructs.

Figure 1: Conceptual Model of the Study



Source: Researchers' Conceptualization, 2025

2.2 THEORETICAL REVIEW

The following theories were reviewed to support this research;

i. Balance of Payment Theory

This Theory was propounded by **David Hume in 1752** and it explains how exchange rates and trade balances are interconnected in an open economy. Hume

proposed the concept to address imbalances in trade between nations, particularly focusing on the self-correcting mechanisms of exchange rates under a flexible regime. The theory argues that changes in a country's balance of payments (i.e., its net trade in goods, services, and capital flows) lead to adjustments in exchange rates to restore equilibrium.

The theory operates on the assumption that exchange rates are influenced by the supply and demand for a country's currency, which in turn depends on trade balances and capital flows. A trade surplus increases the demand for a nation's currency, appreciating its value, while a trade deficit depreciates the currency due to excess supply in the foreign exchange market. Under a floating exchange rate system, these adjustments naturally correct imbalances over time. **Supporters of the Theory** include later economists like **John Maynard Keynes (1936)** and proponents of the Mundell-Fleming model (**Robert Mundell and Marcus Fleming, 1960s**), who expanded on the interactions between exchange rates, interest rates, and capital flows. The theory has been applied in numerous economic analyses, particularly in understanding how exchange rates influence global trade. For instance, it has been widely used to study the impact of exchange rate adjustments in developing economies, such as in Nigeria's structural adjustment program in the 1980s.

This theory is related to this study in the sense that exchange rate fluctuations, driven by trade imbalances, can have unequal (asymmetric) impacts on exports and imports. For example, a depreciating naira might stimulate exports by making Nigerian goods cheaper abroad, but the effect on imports could be more pronounced due to Nigeria's reliance on foreign goods. The theory also underpins the relationship between exchange rate and investor confidence, affecting capital flows, and consequently, trade dynamics.

ii. Risk Aversion Theory

This Theory was propounded by **John von Neumann and Oskar Morgenstern in 1944** as part of their work on expected utility theory in *Theory of Games and Economic Behavior*. The theory explains how individuals or entities make decisions under uncertainty, preferring options that minimize exposure to risk. A risk-averse individual values certainty and tends to avoid investments or decisions with high levels of uncertainty, even if such options offer potentially higher returns. This behavior is characterized by a concave utility function, where the marginal utility of wealth decreases as wealth increases. The theory operates on several assumptions. First, it assumes that decision-makers have well-defined preferences and can rank outcomes based on their expected utility. Second, it assumes that individuals aim to maximize their utility rather than absolute monetary returns. Third, the theory presumes that risk aversion is consistent, meaning individuals consistently prefer less risky options when faced with comparable choices.

The theory has been supported and expanded upon by various scholars. For example, Kenneth Arrow (1965) and John Pratt (1964) explored the concept further by introducing measures of absolute and relative risk aversion, applicable in economics and finance. Applications of the theory are widespread. It underpins modern portfolio theory (Markowitz, 1952) by explaining why investors diversify their portfolios to manage risk. It also informs insurance models and decisions in industries requiring risk management, such as agriculture and international trade.

The relationship of **Risk Aversion Theory** to this study lies in its explanation of how businesses and investors react to uncertainty. Exchange rate creates risk in international trade by making the cost of imports and the value of exports unpredictable. Risk-averse traders and investors might reduce their exposure to such by shifting trade flows or delaying transactions during periods of high uncertainty.

2.3 EMPIRICAL REVIEW

Rasaki and Oyedepo (2023) assessed the symmetric and asymmetric effects of exchange rate on trade flows in Nigeria. The study employs quarterly data and covers the period 1995q1 to 2020q4. The data were sourced from International Financial Statistics (IFS) and Central Bank of Nigeria (CBN) websites. The study applies both linear ARDL and non-linear ARDL (NARDL) models. These methods are employed to evaluate the symmetric and asymmetric effects of exchange rate. The results from linear ARDL model show that exchange rate has only significant short-run effect on export while it has both short-run and long run effects on the imports. The findings from the non-linear ARDL suggest that exchange rate has neither short run nor long run asymmetric effects on exports. However, the non-linear ARDL model reveals short run and long run asymmetric effects of exchange rate on imports. The findings show that increase in reduces imports while decrease in boosts imports. This study contributes to the literature by examining the symmetric and asymmetric effects of exchange rate on trade flows, using the GARCH-based measure of exchange rate.

Kayani et al., (2023) examined the impact of asymmetric exchange rates on trade flows in selected Asian countries and finds that the effects of increased exchange rate on exports and imports differ among Pakistan, Malaysia, Japan, and Korea. The quarterly data from the period 1980 to 2018 is collected from the International Financial Statistics (IFS) database maintained by the International Monetary Fund (IMF). The study employed both linear and non-linear Autoregressive Distributed Lag (ARDL) models for estimation. The non-linear models yielded more significant findings, while the linear models did not indicate any significant effects of exchange rate on trade flows. The results of the study suggest that in the case of Pakistan, both the linear and non-linear models indicate that increased exchange rate adversely affects exports and imports, while decreased enhances both. The study provides

various policy implications regarding the impact of exchange rate on trade flows in developing economies.

Ijirshar et al., (2022) examined the impact of exchange rate on trade flow in Nigeria from 1986 to 2021. The study utilized linear and nonlinear autoregressive distributed lag (ARDL and NARDL) models to test the J-Curve hypothesis and the Marshall-Lerner condition in Nigeria. The study found symmetric effects of exchange rate on trade balance, exports, and imports. The findings also show that real exchange rate depreciation has a strong negative influence on trade balance and exports in the short run but positive in the long run, exhibiting the shape typology of the J-curve. Furthermore, the study revealed evidence of the Marshall-Lerner condition since the sum of the elasticities of export and import is greater than unity. Thus, there is room for long run net trade improvement. The study suggests the need for the Nigerian government to grant investment incentives to domestic firms to expand production and improve on the quality of output to reduce import.

Gap Analysis

Several studies have been conducted on asymmetric effects of exchange rate on trade flows in Nigeria, such as; Rasaki and Oyedepo, 2023; Kayani et al., 2023 and Ijirshar et al., 2022 and the result of their studies shows discrepancies in outcomes, samples, methodologies, and scope, leading to inconsistent and inconclusive findings. These inconsistencies are attributed to the limitations of available data, and the lack of consensus in the literature keeps the discussion intriguing yet inconclusive. Consequently, the need to address this gap motivated the current study to explore alternative perspectives as a foundation for assessing asymmetric effects of exchange rate on trade flows in Nigeria adopting nominal effective exchange rate, real effective exchange rate and total trades as variables of this study

3.0 METHODOLOGY

This research adopted the *ex-post facto* research design using time series cross-sectional data. Based on the nature of this study which was on the asymmetric effect of exchange rate on trade flows in Nigeria, this research design suites this study. The study adopted secondary source of data which was collected from the Central Bank of Nigeria (CBN) Statistical Bulletin. These data source provide information on the macro-economic variables (Nominal Effective Exchange Rate, Real Effective Exchange Rate and Total Trades which covers from 2008-2023.

The study examined the descriptive statistics of the data for the variables, after which the series were tested for the presence of the unit root using the ADF unit root test. The Ordinary Least Square (OLS) procedure of analysis is used to estimate the model with the aid of computer statistical application (E-view 10). This method is

preferred to others because it is the best, linear, unbiased, estimator, minimum variance, zero mean value of random terms, it is a multiple regression analysis etc. (Koutsoyiannis, 2003). The Wald test was used to examine the joint significance of the coefficients.

Model Specification

The asymmetric and mathematical form of the model are specified in a functional relationship as follows;

ToT = f(NEER, REER) - - - - - - - (1)

The OLS linear regression equation based on the above functional relation for models 1 is mathematically stated as:

$ToT = \beta_0 + \beta_1 NEER + \beta_2 REER + U_t$ - - - - - (2)

Where:

ToT = Total Trades
NEER = Nominal Effective Exchange Rate
REER = Real Effective Exchange Rate
β_0 = autonomous intercept
β_1 = coefficient of nominal effective exchange rate
β_2 = coefficient of real effective exchange rate
U_t = Disturbance term

Apriori Expectation of the model

The apriori expectation for the study was symbolically represented as; $\beta_1 > 0$, $\beta_2 > 0$.

This implies that research assumes the independent variable(s) of the model will have on the dependent variable at the end of the data estimation; the apriori expectation of this model is expected that depreciation of both NEER and REER would likely improve the terms of trade in Nigeria, leading to higher trade flows, assuming other factors are constant.

4.0 DATA PRESENTATION AND ANALYSIS

4.1 DATA PRESENTATION

The Central Bank of Nigeria was used to generate data for the study alongside various variables such as; Nominal Effective Exchange Rate (NEER), Real Effective Exchange Rate (REER) and Total Trades (ToT) which were used as proxy for the analysis. Data for the study spans from 2008-2023.

4.2 RESULTS

Unit Root Test

Table 1: Unit Root Test Results

Variable	ADF Statistics	Critical value @5%	Level of Stationarity
NEER	-4.90214	-3.081002	I(0)
REER	-7.690214	-3.040391	I(0)
ToT	-5.928307	-3.020686	I(0)

Source: Researcher's computation with the aid of E-View 10

Unit root test is taken to check the stationarity of the variables used in estimating the model. From the table 1 above, the unit root test result revealed that Nominal Effective Exchange Rate (NEER), Real Effective Exchange Rate (REER) and Total Trades (ToT) were stationary at level I(0), thus, warrant the use of regression result and Hence, the data used were free from spurious results.

ARDL Bound Test

Table 2: Bound Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.167415	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	15		Finite Sample: n=30	
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Source: Researcher's computation with the aid of E-View 10

The findings from the ARDL Bounds Test reveal that there is evidence of a long-run relationship between exchange rate and trade flows in Nigeria at the 10% significance level. The F-statistic value of 4.167415 exceeds the upper critical bound (I(1)=3.695I(1) = 3.695) at 10%, indicating a statistically significant long-term association. However, the result is inconclusive at the 5% significance level, as the F-statistic lies between the lower (I(0)=3.538I(0) = 3.538) and upper bounds (I(1)=4.428I(1) = 4.428), and there is no evidence of a long-run relationship at the 1% level, where the F-statistic is below the lower bound (I(0)=5.155I(0) = 5.155). These findings suggest that while exchange rate does influence trade flows over time, the strength of this relationship is sensitive to the level of statistical significance.

Wald Test

Table 3: Wald Test Result

Test Statistic	Value	df	Probability
F-statistic	41.28953	(2, 10)	0.0000
Chi-square	82.57906	2	0.0000
Null Hypothesis: C(1)=0, C(2)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(1)		209958.8	26605.65
C(2)		-372781.8	157728.0

Source: Researcher's computation with the aid of E-View 10

The findings from the Wald Test indicate that both the Nominal Effective Exchange Rate (NEER) and the Real Effective Exchange Rate (REER) have significant effects on trade flows (ToT) in Nigeria, confirming the presence of asymmetric impacts. The F-statistic value of 41.28953 and the Chi-square value of 82.57906, both with p-values of 0.0000, provide strong evidence to reject the null hypothesis that the coefficients C(1)C(1) and C(2)C(2) are jointly equal to zero. This suggests that changes in exchange rate measures significantly influence Nigeria's trade flows.

The positive coefficient for NEER (C(1) =209958.8C(1) = 209958.8) indicates that nominal exchange rate appreciation positively affects trade flows, potentially by making imports cheaper or enhancing the global competitiveness of Nigerian exports. Conversely, the negative coefficient for REER (C(2) =−372781.8C(2) = -372781.8) shows that real exchange rate depreciation negatively impacts trade flows, possibly due to increased costs or reduced competitiveness in real terms. These results highlight the asymmetry in the effects of exchange rate movements on trade, where nominal and real exchange rate dynamics exert opposite influences.

Descriptive Statistics

Table 4: Summary of Descriptive Statistics

ToT		**NEER**	**REER**
Mean	30229760	143.4925	81.36813
Median	24849436	115.1900	78.90500
Maximum	68890454	286.2600	97.23000
Minimum	14086976	78.96000	63.02000
Std. Dev.	14825510	58.14194	10.46227
Skewness	1.328290	0.871205	0.131817
Kurtosis	4.062579	3.038049	1.864020

Jarque-Bera	5.457661	2.024961	0.906635
Probability	0.065296	0.363317	0.635516
Sum	4.84E+08	2295.880	1301.890
Sum Sq. Dev.	3.30E+15	50707.28	1641.886
Observations	16	16	

Source: Researcher's computation with the aid of E-View 10

From the table above, the descriptive statistic result indicates a total of 16 observations. The table showed the mean, standard deviation, minimum, maximum, Skewness and Kurtosis values of the dependent and independent variables. The result revealed that the mean value of Total Trades (ToT) used in the study is ₦30229760 with standard deviation of ₦14825510. Nominal Effective Exchange Rate (NEER) in the study has a mean of ₦143.4925 with a standard deviation of ₦58.14194 while Real Effective Exchange Rate (REER) has a mean of ₦81.36813 and standard deviation of ₦10.46227

In addition, the data set may be classified normally distributed since the table above indicates that none of the skewness value fall outside the -2 to 2 range. Similarly, the Kurtosis value suggest that the data set is relatively peaked than normal as the majority of the variables differed from zero.

Ordinary Least Square (OLS) Test

The Ordinary Least Square (OLS) Result of the study variables generated from E-views 10 computer software are presented in table 5 below:

Table 5: Ordinary Least Square Result

Dependent Variable: ToT				
Sample: 2008-2023				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEER	211535.4	27207.27	7.774959	0.0000
REER	-375895.2	151198.9	-2.486098	0.0273
C	30461897	13817333	2.204615	0.0461
R-squared	0.859828	Mean dependent var		30229760
Adjusted R-squared	0.838263	S.D. dependent var		14825510
S.E. of regression	5962311.	Akaike info criterion		34.20718
Sum squared resid	4.62E+14	Schwarz criterion		34.35204
Log likelihood	-270.6574	Hannan-Quinn criter.		34.21459
F-statistic	39.87152	Durbin-Watson stat		1.850921
Prob(F-statistic)	0.000003			

Source: Researcher's computation with the aid of E-View 10

Table 5 contained the multiple linear regression estimation result. The result revealed a positive relationship between Nominal Effective Exchange Rate (NEER)

and Total Trades (ToT) with coefficient value of 211535.4 and probability value of 0.0000 while a negative relationship exists between Real Effective Exchange Rate (REER) and Total Trades (ToT) with coefficient value of 375895.2 and probability value of 0.0273. The result conforms to the *apriori* expectations stated earlier. Thus, from the OLS result, the regression equation becomes;

ToT = 30461897 + 211535.4NEER + (375895.2REER)

Table 5 further revealed that the coefficient of determination, R^2 stood at 0.859828. The implication of the above result is that, about 86% of the proportion of the total variation observed in the dependent variable (ToT) were explained by the explanatory variables (NEER and REER) in the model and unexplained variation is 14%. Conversely, the adjusted R^2 value of 0.838263 indicated that even after the adjustment in the model, it still had a good fit. The F-statistic which measured the joint statistical influence of the explanatory variables in explaining the dependent variable stood at 39.87152 with a P-value of 0.0000. This affirmed the influence of the explanatory variables to be statistically significant at 10%, 5% and 1% level of significance. The Durbin Watson (DW) test result with the value of 1.850921 revealed the presence of positive serial correlation (no severe autocorrelation). Hence, the result is reasonably reliable.

4.3 TEST OF HYPOTHESES

The hypotheses formulated in section one of this research was tested in this section. The two (2) raised hypotheses was tested one after the other with the use of OLS regression analysis conducted via E-views

Hypothesis One:

H0: Nominal effective exchange rate has no significant effect on trade flows in Nigeria

The result of regression test presented in table 5 revealed that the P-value of NEER is 0.0000 which is less than 0.05 level of significance. Hence, the null hypothesis is rejected and concluded that there is a significant relationship between nominal effective exchange rate and trade flows in Nigeria

Hypothesis Two:

H0: Real effective exchange rate has no significant effect on trade flows in Nigeria

The result of regression test presented in table 5 revealed that the P-value of REER is 0.0273 which is less than 0.05 level of significance. Hence, the null hypothesis is rejected and concluded that there is a significant relationship between real effective exchange rate and trade flows in Nigeria

4.4 DISCUSSION OF FINDINGS

The study examined the asymmetric effect of exchange rate on trade flows in Nigeria. Proxy of exchange rate used in the study was Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) while Total Trades (ToT) proxied Trade Flows. The results of the empirical analysis conducted are as follows;

Findings revealed that there is a significant relationship between nominal effective exchange rate and trade flows in Nigeria given the p-value of NEER to be 0.0000. This finding is in line with Ijirshar et al., (2022) who indicated that real exchange rate depreciation negatively affects trade balance and exports in the short run but positively in the long run, confirming the J-curve pattern. Additionally, the study supports the Marshall-Lerner condition, suggesting potential for long-term trade improvement.

Furthermore, finding revealed that there is a significant relationship between real effective exchange rate and trade flows in Nigeria given the p-value of REER to be 0.0273. This finding corroborates the research of Sambo et al., (2021) who noted that financial development magnifies the beneficial benefits of the real exchange rate on Nigeria's foreign trade. It also states that the uncertainty in foreign capital flows has a negative impact on Nigeria's international trade. The findings have broad policy implications, implying that in order to diversify and improve the economy's future growth and associated international trade, Nigeria's policymakers should promote adequate financial sector development, as financial shocks are amplified by poorly implemented credit markets.

5.0 CONCLUSION AND RECOMMENDATIONS

The focus of this study was to examine the asymmetric effect of exchange rate on trade flows in Nigeria using data from 2008-2023. The study proxies exchange rate with Nominal Effective Exchange Rate (NEER) and Real Effective Exchange Rate (REER) while Total Trades (ToT) proxies Trade Flows in Nigeria. Secondary time series data for the variables were sourced from Central Bank of Nigeria Statistical Bulletin 2023. This study employed descriptive statistics, ARDL bound test and multiple regression technique based on the E-views 10 statistical software as method of data analysis. The empirical result showed that there is a significant relationship between nominal effective exchange rate, real effective exchange rate and trade flows in Nigeria with probability values of 0.0000 and 0.0273 respectively at 5% level of significance.

Based on the findings of this study, the following are recommended;

1. The Nigerian government and central bank should implement policies that are aimed at stabilizing the exchange rate to reduce, which negatively affects trade flows. Stabilizing the exchange rate through strategic interventions, such as the

establishment of a foreign exchange stabilization fund, could help reduce uncertainty for exporters and importers, encouraging increased trade activities.

2. Finally, government should invest in export diversification strategies to reduce reliance on a single commodity or market such as the crude oil. Also, the government should encourage Nigerian exporters to adopt hedging mechanisms to manage risks associated with exchange rate.

COMPETING INTERESTS

The authors have declared that they have no known conflicting financial interests, non-financial interests, or personal ties that could have influenced the work presented in this study.

DISCLOSURE OF AUTHORS' CONTRIBUTION

The individual contribution from each author towards the completion of this study is stated as follows: particularly in areas of conception, design, execution and interpretation of the research.

In the area of conception and overall coordination of the research endeavor, **Solomon R. Irmiya**, as the lead author, was the driving force. He also partnered with **Susanna Silas** in the area of data sourcing, analysis, interpretation and conclusion.

In the area of Literature Review and Methodology Design, it was the combined collaboration of **Dalot Nankwat Lovina**, **Miri Julia Julcit, Nzeli Nkechi Augustina** and **Chibuzor Desmond Anthony**

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