CHAPTER ELEVEN

EXCHANGE RATE, TRADE ELASTICITY AND NET EXPORTS IN NIGERIA: A POLICY AND DEVELOPMENT CALL

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Abstract

The missing link between trade and economic development has been the reason to respond to a call for policy and development with regard to international commerce. This research subsequently uses time series data from the Central Bank of Nigeria (CBN) covering the years 1981–2023 to investigate the effect of the currency rate–trade elasticity on net exports in Nigeria. On the basis of the mixed order of integration found by the unit root test, this study used the ARDL estimation approach. Net exports (NEX) was the dependent variable, while the independent variables were the exchange rate (EXCH), exchange rate elasticity of imports (EEM), and exchange rate elasticity of exports (EEX). The analysis revealed that whereas the exchange rate elasticity of imports (EEM) and exports (EEX) has a positive but nonsignificant effect on net exports (NEX), the exchange rate has a negative and nonsignificant long-term association with net exports. The analysis infers that trade elasticity and exchange rates have a negative effect on net exports. The study suggests that to lower volatility and create a stable trading environment, the Central Bank of Nigeria (CBN) should establish consistent and clear currency rate rules.

Keywords: Exchange rate, Trade elasticity, Net exports, Policy, ARDL

1. Introduction

Almost no economy in today's globalized world adheres to complete autarky. This is because both domestic capital flows and foreign capital flows have direct or indirect effects on the economies of all nations. Foreign exchange plays a crucial role in international endeavors, and its volatility has piqued the interest of essential stakeholders who want to make informed decisions about it. When responding to calls for policy and development, Nigeria's economic stability and growth prospects must be carefully considered, and careful analysis between exchange rates and net exports is needed. To emphasize, an exchange rate is defined by Iyoboyi and Muftau (2014) as the cost of exchanging one currency for another, or the amount of one currency required to buy one unit of another currency.

According to Akpan (2018), institutional changes in the economy, structural shifts in production, and evolving patterns and trends in international commerce all affect Nigeria's foreign exchange market. Obadan (2006), referenced in Okorontah (2020), is of the opinion that exchange rate determinants are given a global trade dimension by secondary variables. They also shed light on the causes for the changes in the Nigerian naira's (NGN) exchange rate over time versus major currencies such as the US dollar (USD) and the euro (EUR). Exchange rate fluctuations affect the cost of imports and exports, which in turn affects net exports (Aliyu, 2011). It has been observed that the naira depreciated since the 1970s, despite numerous attempts by the Nigerian government to keep the exchange rate steady (Benson & Victor, 2012). Because of these exchange rate fluctuations, it is necessary to view the dynamics of the exchange rate as a random variable that tracks changes in the value of one currency over time in relation to another.

The exchange rate may be positive or negative. An increasing exchange rate becomes unfavorable and lowers the cost of imports, whereas a declining exchange rate favors home currency and increases the cost of exports. Owing to decreased demand and prices for homegrown goods as a result of international market rivalry, the naira weakens as import inflation gains traction (Obaseki, 2001). Such a

negative movement in the exchange rate indicates that a decline in home currency worth is linked to a decline in the cost of services in foreign markets as opposed to an increase in those costs. Policymakers have recently become concerned with the exchange rate behavior observed in Nigeria. Significant swings in currency rates have affected the nation's net export dynamics with international partners. Additionally, it has had an unfavorable effect on the nation's economy, export-import competitiveness, import costs, total net exports, and the degree to which exports and imports are responsive to fluctuations in exchange rates.

Trade elasticity, or the aggregate reaction of trade to such relative exchange rate shocks, is measured by responsiveness and is derived from supply and demand factors in the economy. Trade sensitivity to an exchange rate shift is measured by exchange rate trade elasticity. The most common example of this sensitivity is the shift in supply and demand in relation to income, price, and exchange rate variations. The impact of exchange rate fluctuations on net exports is determined by trade elasticity. Higher trade elasticity indicates that a decline in home currency would result in lower prices for exports and higher prices for imports, leading to a significant rise in export volume and a decrease in imports. As a result, the trade balance of the diversified economy has improved, and net exports have increased. Unfortunately, Nigeria's economy is monoculture since crude oil accounts for 90% of its GDP. As a result, it is vulnerable to fluctuations in local production, foreign demand, and global oil shocks.

Nigeria's net export numbers have faced challenges recently, including falling oil output as a result of security and operational concerns, unstable oil prices globally, and high import costs as a result of local inflation and currency depreciation, which has led to a trade deficit. It appears that during the fourth quarter of 2023, Nigeria's whole commerce volume was ₦26,801.95 billion, of which ₦12,693.62 billion came from exports and ₦14,108.33 billion from imports. A minor trade surplus resulted from ₦71,880.01 billion in total annual commerce, which was made up of ₦35,962.39 billion in

exports and ₦35,917.62 billion in imports (National Bureau of Statistics, 2024). These findings unequivocally demonstrate that Nigeria's experience with a trade deficit causes its trade elasticity to be more sensitive to imports than to exports, making the country's foreign trade strategy more ineffectual and vulnerable to outside shocks. This is a matter worthy of policy consideration. As a result, the purpose of this study was to investigate and record the effects of exchange rate volatility, exchange rate elasticity of imports, and exchange rate elasticity of exports on net exports, as well as to determine the direction of Granger causality between the variables under investigation. This is the issue that motivated the investigation. The literature review is found in Section 2 of the report. The methodology, results, and discussion are presented in Sections 3 and 4, and Section 5 contains closing thoughts.

2. Literature Review

Theoretical Review

Purchasing power parity theory: The Gustav Cassel of Sweden first proposed purchasing power parity (PPP) economic theory. The hypothesis holds that the purchasing power of two countries' currencies determines the rate at which they exchange currencies. This rate is used to equalize the two purchasing powers. This implies that after exchanging currencies, the price of items in each nation will be the same. The economic conditions of nations worldwide are frequently compared via PPP economic theory. The hypothesis, according to Owuru and Farayibi (2016), is one of the most often used metrics to calculate GDP in many national economies. To evaluate economic performance, each nation is required to collect and publish its own data, which are subsequently compared to those of other nations (Oraka, *et al*., 2018). Owing to the significant price differentials between established and developing economies, converting a country's GDP to its market rate may not be sufficient. Because of this, the GDP determined via the PPP statistic is now widely used. The theory's drawback, however, is that it is predicated on the notion of arbitrage—the chance to purchase a good in one

location and promptly sell it for a greater price in another, profiting from price differences. As a result of buying and selling, prices gradually converge (Olufayo & Babafemi, 2014). In actuality, however, trade restrictions, government taxes, and transaction expenses keep costs from levelling out. This provides context for reviewing different hypotheses.

International Fisher effect (IFE): Irving Fisher developed the International Fisher Effect (IFE) theory, which holds that changes in the nominal interest rates of two nations are directly correlated with shifts in the currencies' exchange rates over time. According to this economic theory, the difference between the nominal interest rates of two nations is roughly equal to the predicted discrepancy between the exchange rates of those countries. According to Ijirshar, *et al*. (2022), the theory explains how inflation and real as well as nominal interest rates relate to one another. For the Fisher effect, the nominal interest rate less the anticipated rate of inflation equals the real interest rate. In view of this, Imoughele and Ismaila (2015) say that this hypothesis explains how interest rates and exchange rate changes interact. This implies that disparities in predicted rates of inflation cause currencies with higher nominal interest rates to weaken relative to currencies with lower interest rates.

Capital movements and the relative costs of commodities and services affect the balance of payments. Therefore, knowing these dynamics aids in better managing trade surpluses and deficits by nations, offering insights into the effects of exchange rate differentials on currency values, and assisting different stakeholders in navigating the intricacies of international financial markets (Arise, *et al*., 2018). In accordance with Agbaeze, *et al*. (2023), the theory offers a framework for projecting future changes in exchange rates on the basis of variations in interest rates between two nations. This is an essential tool for assessing trade investment returns and guaranteeing the desired economic outcome of export competitiveness. It can also assist businesses, investors, and governments in anticipating currency volatility and making well-informed decisions. This explains the

theory's application, as the study explores the effects of trade elasticity and exchange rates on Nigeria's net exports to provide policy and development recommendations.

Classical balance of payment theory (BOP): An economic theory known as "classical balance of payments theory" explains how financial transactions and international commerce balance out over time. Drawing from the theories of classical economists such as Adam Smith, David Ricardo, and John Stuart Mill, it highlights the natural mechanisms that resolve trade imbalances. The theory implies price adjustment through monetary policy and is reminiscent of the Ricardian system with its emphasis on price changes, quantity theory of money, and flexibility of costs and prices. The fundamental tenet of the approach is to encourage nations to employ automatic stabilizers to address imbalances. In other words, if a nation has a trade deficit (meaning it imports more than it exports), this will cause a gold or currency outflow, which will cause the nation's currency to depreciate. This will eventually cause the gap to be corrected as imports become more expensive and exports become less expensive. The theory covers trade, investment, and financial flows, among other aspects of the transactions between a country and others. It also provides a set of economic concepts and frameworks that are used to comprehend and analyze these interactions. The concept here is that the money supply is affected by the balance of payments, which causes prices to fluctuate gradually. In the contemporary context, the balance of payments can be characterized as an accounting system where a country or region serves as the accounting entity and all economic transactions between its citizens and those of the rest of the world are entries (Badger, 2015).

Theoretical Framework

The foundation of this research is the theory of purchasing power parity (PPP) and the classical balance of payments (CBOP), which both address concepts and issues in international economics that pertain to various facets of economic exchanges between nations,

including trade balances and exchange rates. According to PPP theory, which is an economic theory, exchange rates should eventually stabilize and allow identical items or bundles of goods to be valued at the same amount when represented in a common currency. This implies that after accounting for price levels, the buying power of several currencies should be equal. On a different level, CBOP theory highlights how mechanisms such as exchange rate modifications cause the balance of payments to automatically adjust. When a nation experiences a trade deficit, its currency weakens, resulting in lower export prices and higher import prices, which finally closes the imbalance. To address a call for policy and development, the PPP-CBOP framework in this direction describes exchange rates and trade relationships among nations, which is crucial for evaluating how exchange rates and trade elasticity impact net exports in Nigeria.

Empirical Review

Numerous viewpoints have been reached by economists, who have investigated the impact of net exports (NEX) on exchange rate dynamics. Agbaeze, *et al*. (2023) argue that nonoil imports and trade openness endogenously contribute to Nigeria's import volume more than official exchange rate volatility does. The impact of the exchange rate on trade flow in Nigeria between 1986 and 2021 was examined by Ijirshar, Okpe, and Andohol (2022) via the ARDL and NARDL models to test the J-curve hypothesis and the Marshall–Lerner condition. The study revealed that imports, exports, and the trade balance were all symmetrically affected by exchange rates. The results also demonstrate that real exchange rate depreciation has a J-curve shape, with a significant short-term negative effect on the trade balance and exports but a long-term beneficial effect. Since the total of the import and export elasticities is greater than unity, the analysis also provided evidence for the Marshall–Lerner condition.

Eneh and Amakor (2021), via the multiple regression method, investigated the effects of foreign exchange regimes on a selection of macroeconomic indicators in Nigeria from 1999--2020. According to the analysis, there is a positive but not statistically significant correlation between exchange regimes and inflation at the 5% level.

Okeke and Okeke (2021) examined the relationship between the naira exchange rate (EXR) and export volume (EX) in Nigeria from 1983--2020. The study revealed two cointegrating equations and a negative and significant error correction model (ECM). To test the possibility of an asymmetric exchange rate effect on GDP, Ibrar, Jawad, Arshad-Ali, and Yahya (2019) looked at the indirect effect of exchange rate movements on GDP in Pakistan via the nonlinear ARDL technique. They reported that there was an asymmetric impact of the exchange rate on GDP growth in Pakistan from 1972--2014. Adopting a simultaneous equation model, Aman, *et al*. (2019) investigated the impact of economic development on the exchange rate from Pakistani, 1976–2018. The study revealed a favorable correlation between exchange rates and economic growth through FDI inflow, increased investment volume, export promotion incentives, and the development of import replacement industries.

Akinniran and Olatunji (2018) used regression analysis to investigate Nigeria's agricultural exports before and after SAP and reported that agricultural exports from Nigeria are positively impacted by exchange rate devaluation and that these exports ultimately rely on crude oil prices and the currency rate. The real effective exchange rate, a proxy for devaluation, and gross agricultural output have an inverse relationship, according to research by Oye, *et al*. (2018) on the effects of exchange rate devaluation on agricultural output in Nigeria, 1986–2016. Johansen's cointegration technique and ECM were utilized by Arise, *et al*. (2018) to identify the negative impact of real exchange rate fluctuations on exports. The analysis used quarterly data from thirteen less developed countries (LDCs) covering the period from 1973--1996. The findings showed that, in the short and long terms, an increase in REER had a statistically significant negative effect on export demand in each of the thirteen (13) countries.

Nwogwugwu, *et al*. (2017) estimate the price and income elasticities of import demand in Nigeria for the years 1970–2013 via the framework of the import substitution model. The computed long-term coefficients, which were computed via the autoregressive distributed lag (ARDL) bound technique, indicate that the price and

income elasticity of import demand in Nigeria were approximately 0.03 and 0.55, respectively, for the studied period. Similarly, Ufoeze, Okuma, and Nwakoby (2017) examined the effects of fluctuations in foreign exchange rates on the Nigerian economy from 1970--2012 via ordinary least squares (OLS). They found that the floating exchange rate era is more useful for determining Nigeria's economic trend and that exchange rates have a direct effect on GDP during the fixed exchange era and a negative effect during the floating era.

Owuru and Farayibi (2016) used a descriptive approach to examine the trends in exchange rates and Nigeria's export performance between 1970 and 2015. They found that, despite policy announcements during that time, exchange rate volatility had a significant effect on Nigeria's export performance, particularly the amount of export demand. Imoughele and Ismaila (2015) used time series data and Johansen's cointegration to study the effect of the exchange rate on nonoil exports. According to the study, there is a long-term association between the variables. The vector error correction technique was employed by Adelowokan, *et al*. (2015) to investigate the effects of exchange rate fluctuations on investment and growth in Nigeria. The findings establish a direct correlation between the exchange rate and interest in Nigeria and inflation, as well as an unbalanced relationship between the exchange rate and investment and growth.

Olufayo and Babafemi (2014) used generalized autoregressive conditional heteroskedasticity (GARCH) to study the effects of exchange rate volatility on oil and nonoil exports in Nigeria from 1980--2011. They reported that there was a negative but not significant correlation between exchange rate volatility and the NEXh of oil and nonoil exports. A study on the implications of foreign exchange liberalization for private investment in Nigeria was conducted by Akanji (2011), who used ordinary least squares and reported a substantial negative association between the two variables. Tomlin (2014) suggested that by altering plant turnover, the real exchange rate could have an impact on overall productivity. The average industrial productivity in a small open economy was found to

be negatively impacted over the long run by the observed transitional drop. The studies mentioned above demonstrate the variety of ways in which exchange rates have been examined economically. Nevertheless, to the degree that the autoregressive distributive lag (ARDL) and Granger causality test techniques have been used, the influences of the currency rate and trade elasticities (i.e., import elasticity and export elasticity) on net exports in Nigeria from 1982--2023 have not been established in the literature. This gap made the current investigation necessary.

3. Methodology

This study used secondary data from secondary sources that were taken from World Bank indicators and the Central Bank of Nigeria (CBN) statistical bulletin published between 1981 and 2023. It adheres to the ex post facto research design. The model's basic linear equation is derived from the evaluated theoretical and empirical literature. Dynamic model for examining how Nigeria's net exports are affected by trade and exchange rate elasticities (expressed as export and import exchange rate elasticity, respectively). Studies (Agbaeze, *et al*., 2023; Ijirshar, *et al*., 2022; Eneh & Amakor, 2021; Okeke & Okeke, 2021) that claim that trade becomes a function of the exchange rate once an economy is not in strict practice of autarky specify the functional relationship. Trade elasticity is added to the relationship described as the functional relationship, which modifies this argument:

$$NEX = f(EXR, EEX, EEM) \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad 3.1$$

where NEX= Net export; EXR= Exchange rate; EEX= Exchange rate elasticity of exports; and EEM= Exchange rate elasticity of imports.
The econometric specification of equation (1) becomes:

$$NEX = b_0 + b_1EXR_t + b_2EEX_t + b_3EEM_t + u_t \quad \ldots\ldots\ldots\ldots\ldots \quad 3.2$$

where u= the error term and b_0, b_1, b_2, and b_3 are the parameters to be estimated.

From equation 3.2, it is theoretically expected that:

$\frac{\delta NEX}{\delta EXR} < 0; \frac{\delta NEX}{\delta EEX} > 0; \frac{\delta NEX}{\delta EEM} < 0$

The analytical procedure adopted includes descriptive, correlation matrix, unit root test, autoregressive distributive lag (ARDL) and Granger causality methods as well as residual diagnostic tests. To perform the bound test for cointegration, the model is specified as follows:

$$\Delta lnNEX_t = \alpha_{01} + \beta_{11} lnNEX_{t-i} + \beta_{21} lnEXR_{t-i} + \beta_{31} lnEEX_{t-1} + \beta_{41} EEM_{t-1} + \sum_{i=1}^{p} \alpha_{1i} \Delta lnNEX_{t-1} + \sum_{i=1}^{q} \alpha_{2i} \Delta lnEXR_{t-1} + \sum_{i=1}^{R} \alpha_{3i} \Delta lnEEX_{t-1} + \sum_{i=1}^{S} \alpha_{4i} \Delta EEM_{t-1} + \mu_{1t} \quad \ldots\ldots\ldots\ldots\ldots\ldots \quad 3.3$$

4. Results and Discussion

Table 1: Results of the descriptive statistics of the variables

	NEX	EXR	EEX	EEM
Mean	26.27693	118.4614	154.2515	83.72047
Median	35.76697	118.5667	0.214790	-0.994246
Maximum	72.47196	425.9792	4158.916	6266.591
Minimum	-50.58686	0.673461	-694.9422	-3042.743
Std. Dev.	30.98376	119.2507	839.9838	1122.340
Skewness	-0.743050	1.000741	3.889489	3.709944
Kurtosis	2.835061	3.184373	17.61876	25.17891
Jarque-Bera	3.819322	6.901537	468.4601	934.3876
Probability	0.148131	0.031721	0.000000	0.000000
Sum	1077.354	4856.919	6324.311	3432.539
Sum Sq. Dev.	38399.72	568829.1	28222909	50385898
Observations	41	41	41	41

Source: Researchers' Computation, 2024

The results of the descriptive statistical tests of the study variables are shown in Table 1. The results are displayed on the basis of the study variables' statistical characteristics. The standard deviation value of net exports (NEX) is 30.98376, the median score is 35.76697, and the mean is 26.27693. It had kurtosis values of 2.83561

and -0.74350, respectively, indicating a positive skew. NEX reached its highest point in 2004 at 72.47196, and its lowest point was -50.58686 in 1982. The exchange rate (EXR) has a mean value of 118.4614, a median value of 118.5667, a maximum value of 425.9792 in 2022 and a minimum value of 0.673461 in 1982. The EXR value from 1999--2022 is less than the mean value of 21.19. Nevertheless, with a standard value of 119.2507 from 1982--1998, it was below it. The significant and positive skewness of the data distribution is shown by the skewness value of 1.000741.

The mean and median values of the exchange rate elasticity of exports (EEX) are 154.2515 and 0.24790, respectively. The greatest and minimum values of EEX are 4158.916 and -694.9422 in 2009 and 2002, respectively. Compared with the values of EEX from 1982--2008, 2010--2016, and 2018--2022, the mean value of 154.2515 is greater. Nevertheless, it was lower than its normal value of 839.9838 in both 2009 and 2017. The skewness value is 3.889489, and the kurtosis value is 17.61876. The exchange rate elasticity of imports, or ERM, has a standard value of 1122.340 and a mean value of 83.72047, a median value of -0.994246, and maximum and minimum values of 6266.591 and -3042.743 in 2000 and 1999, respectively. The data distribution is strongly and positively skewed, as indicated by the skewness value of 3.709944 and kurtosis of 25.17891.

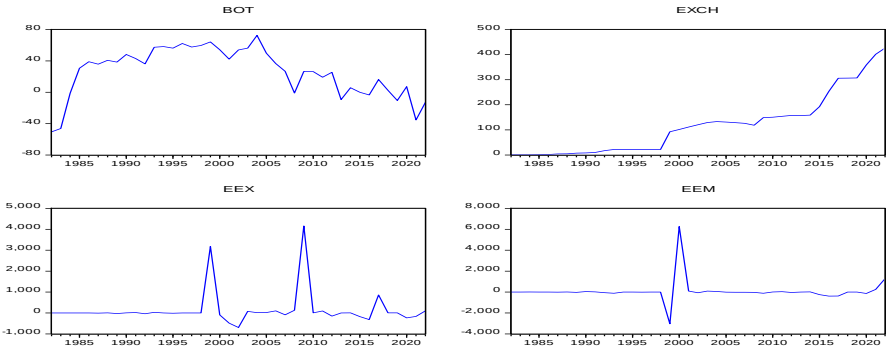

Figure 1: Trend analysis results
Source: Authors' Design, 2024.

Net exports (NEX) are shown in Panel A of Figure 1 above for the years 1982 through 2022. NEX increased between 1982 and 1985 and then somewhat decreased between 1986 and 1987. As shown in the above diagram, the movement of NEX varied from 1982–2022. Additionally, as shown in Panel B of Figure 1 above, the exchange rate (EXCH) increased between 1982 and 2022. This indicates that there has not been a consistent exchange rate over this time. In a similar spirit, the exchange rate elasticity of imports and exports in panels C and D has not been constant. Over time, there have been imbalances in the economy.

Table 2: Results of the correlation matrix

	NEX	EXR	EEX	EEM
NEX	1	-0.440174	0.104196	0.013868
EXCH	-0.440174	1	0.021432	0.052210
EEX	0.104196	0.021432	1	-0.299776
EEM	0.013868	0.052210	-0.299776	1

Source: Authors' Computation, 2024

The results of a correlation test that was performed on each of the research variables to ascertain the strength and direction of the associations between the four variables—NEX, EXR, EEX, and EEM—are displayed in Table 2. Both the NEX and EXR as well as the EEM have a slight positive linear association, as indicated by correlation coefficients of 0.104196 and 0.013868, respectively. This implies that EEX and EEM increase in tandem with NEX. The NEX and EXR have a negative association, as shown by the correlation coefficient of -0.440174.

Table 3: Results of the Unit Root Test

	At level			At 1st difference				
Variable	**t-stat**	**Critical value at 5%**	**P value**	**t-stat**	**Critical value at 5%**	**p value**	**Order of integration**	**Remarks**
NEX	-2.7495	-3.5403	0.2242	-6.45171	-3.54032	0.0000	I(1)	Stationary at 1st difference
EXR	2.76965	-2.9369	1.0000	-4.18163	-2.93898	0.0022	I(1)	Stationary at 1st difference
EEX	-6.3019	-2.93694	0.0000	-4.38740	-2.96041	0.0016	I(0)	Stationary at level
EEM	-8.9445	-2.93694	0.0000	-6.72144	-2.94342	0.0000	I(0)	Stationary at level

Source: Authors' Computation, 2024.

The results of the unit root test, which was used to address or stationalize the oscillations that define the variables as shown in the previously reported trend analysis, are shown in Table 3 of the study. Since both the NEX and EXR t-statistic values are below the critical values, it is clear from the findings that they are stationary at the initial difference. Their p values of less than 5% support this as well. However, EEX and EEM remain stable. There is a mixed order of integration, as evidenced by the findings shown in Table 3, which shows that the variables are stationary at different orders of integration. This merely suggests that the autoregressive distributive lag (ARDL) estimation approach is the proper data analysis method required for this investigation.

Table 4: Presentation of ARDL bounds test results

Test Statistic	**Value**	**Significance**	**I(0)**	**I(1)**
			Asymptotic: n=1000	
F-statistic	3.594404	10%	1.9	3.01
K	4	5%	2.26	3.48
		2.5%	2.62	3.9
		1%	3.07	4.44

Source: Authors' Computation, 2024.

The ARDL bound test for cointegration was used to determine whether the variables cointegrated. The outcome (shown in Table 4) demonstrates that, at the 5% significance level, the F statistic (3.594404) is greater than that of NEXh in terms of the lowest and upper bounds (I(0) and I(1), respectively). This outcome demonstrates that these factors have a substantial long-term association.

Table 5: Short-Run Estimation Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
NEX(-1)	0.455783	0.168631	2.702837	0.0124
NEX(-2)	0.634340	0.225375	2.814595	0.0096
NEX(-3)	0.077997	0.200999	0.388048	0.7014
NEX(-4)	-0.301964	0.147828	-2.042675	0.0522
EXR	0.237143	0.142088	1.668984	0.1081
EXR(-1)	-0.272560	0.155346	-1.754536	0.0921
EEX	0.002712	0.003328	0.814981	0.4231
EEX(-1)	0.006402	0.003542	1.807371	0.0833
EEM	-0.000651	0.002697	-0.241350	0.8113
EEM(-1)	0.002202	0.002585	0.851808	0.4027
EEM(-2)	0.006094	0.002599	2.345006	0.0276
EEM(-3)	0.006207	0.002532	2.451641	0.0219
EEM(-4)	0.004597	0.002135	2.153135	0.0416
CointEq(-1)*	-0.133843	0.034641	-3.863688	0.0007
R-squared	0.842347	Mean dependent var		30.94365
Adjusted R-squared	0.763520			
S.E. of regression	12.97906			
Sum squared resid	4042.947			
Prob(f-statistic)	0.00001			
Durbin-Watson stat	1.894086			

Source; Authors' computation, 2024

The estimation outcome revealed that the following series have cointegration: exchange rate elasticity of import (EEM), exchange rate elasticity of export (EEX), net export (NEX), and the exchange rate (EXR). We also examined the impact of exchange rate changes on net exports in Nigeria in the short term and with regard to the error correction term (ECM). The effect of exchange rate variations on Nigeria's net exports is displayed in Table 5 above. Table 5 shows that the corrected R-square values indicate that the combined impact of EEX, EEM, and EXR accounts for 76% of the variation in net exports. However, the statistical significance of this model is demonstrated (F statistic: 0.0000). Furthermore, Durbin–Watson

(1.894085) indicates that heteroskedasticity is absent. Additionally, the independent variables' coefficients and probability values are shown. The outcome makes it clear that net exports depend on the present value, the lagged value of the variable, and the values of the other exogenous variables in the model.

This coefficient is 0.455783 at the first, second, third, and fourth lags and 0.634340, 0.077997, and -0.3019664, respectively. The current and first lag coefficient values for the EXR are 0.237143 and -0.272560, respectively. This indicates that a 100% increase in the EXR caused the NEX to increase by 24% this year and decrease by 27.3% the next year. With P values of 0.1081 and 0.0921, the NEXh values for the current and first lag periods do not appear to be statistically significant. As shown in Table 4 above, the inflation rate increases by 32.8% and 209%, respectively, for every 100% change in the INTR during the first and second lag periods. An economic theory does not support this. Table 5 above clearly shows that the exchange rate elasticity of exports in the present and first lags has coefficients of 0.002712 and 0.006402, respectively, and that these values do not significantly differ, with p values of 0.0833 and 0.4231, respectively. In the current and initial lags, a 100% increase in the EEX NEXh leads to 0.27% and 0.64% increases in the NEX.

Additionally, the current, first, second, third, and fourth lagged periods' exchange rate elasticity on import (EEM) coefficients are -0.000651, 0.002202, 0.006094, 0.006207, 0.004597, and -0.133843, respectively. In the first, second, and third lags, a 100% increase in the EEM results in 0.22%, 0.60%, and 0.45% increases in the NEX, respectively. In contrast, a 100% increase in the EEM will cause 0.006% and 13.8% decreases in the NEX during the current and fourth lag periods, respectively. Only the EEMs in the second, third, and fourth lag periods from the previous table demonstrated statistical significance, with p values of 0.0276, 0.0219, and 0.0416, respectively. In addition to the short-term coefficients, the error correction term (ECM) coefficient is also appropriately negative (-0.13843) and statistically significant (0.0001). This suggests that in the long run, any short-term disequilibrium will require 13% of the variables to be adjusted to achieve equilibrium.

Table 6: Results of long-term coefficient estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCH	-0.264613	0.225646	-1.172690	0.2524
EEX	0.068091	0.038469	1.770036	0.0894
EEM	0.137841	0.069270	1.989917	0.0581

EC = NEX - (-0.2646*EXCH + 0.0681*EEX + 0.1378*EEM)

Source: Authors' Computation, 2024

The long-run coefficients of the ARDL were determined in light of the data from the bounds test and are given in Table 6. This finding demonstrates that the exchange rate has long-term negative and insignificant relationships with net exports, whereas the exchange rate elasticity of imports (EEM) has a positive but insignificant effect on net exports (NEX), and the exchange rate elasticity of exports (EEX) has a positive and nonstatistically significant association with net exports (NEX). More crucially, at the 5% significance level (0.0000 < 0.05), the long-run links between the exchange rate, exchange rate, elasticity of import (EEM), and exchange rate elasticity of export (EEX) are not significant. Table 6 shows that the exchange rate has a long-term negative effect on net exports, resulting in a decrease of 26.5%. Furthermore, over time, the elasticity of exports (EEX) and the exchange rate lead to a 6.8% rise in net exports. On the other hand, over time, the exchange rate elasticity of imports (EEM) leads to a 13.8% increase in net exports. Every time the agricultural sector deviates from equilibrium, the error correction term estimated in Table 5 is applied, and the adjustment speed is set at 13%. In other words, over time, the agricultural sector's changes are reversed at a rate of 13%.

Table 7: Results of the coefficient significance of the exchange rate, trade elasticity and net exports

	Short-term			Long-run		
Variable	**Coefficient**	**Prob.**	**Remark**	**Coefficient**	**Prob.**	**Remark**
EXR & NET	0.237143	0.1081	Not significant	0.264613	0.2524	Not significant
EEX & NET	0.002712	0.4231	Not significant	0.068091	0.0894	Not significant
EEM & NET	-0.000651	0.8113	Not significant	0.137841	0.0581	Not significant

Source: Author's Computation via E-views 10, 2024

Table 7 indicates that there is no statistically significant link in the short term (β = 0.237143, p = 0.1081) between the exchange rate and net exports for the current year. As a result, the null hypothesis—that there is no meaningful short-term relationship—is accepted. Therefore, the current year's net exports are not significantly impacted in the short term by the exchange rate. On the other hand, the long-term association between net exports and the exchange rate (β = -0.264613, p = 0.2524) is not statistically significant. As a result, we agree with the null hypothesis that there is no meaningful long-term link. Therefore, the current year's net exports are not strongly affected by the exchange rate over the long term.

For the present year, there is no statistically significant association between the exchange rate elasticity of exports and net exports in the short term (β = 0.002712, p = 0.4231). As a result, the null hypothesis—that there is no meaningful short-term relationship—is accepted. Therefore, the current year's net exports are not significantly impacted in the short term by the exchange rate elasticity of exports. On the other hand, there is no statistically significant correlation between the long-term exchange rate elasticity of exports and net exports (β = -0.068091, p = 0.0894). As a result, we agree with the null hypothesis that there is no meaningful long-term link. As a result, net exports in the present year are significantly impacted over the long term by the exchange rate elasticity of exports.

For the present year, there is no statistically significant association between the exchange rate elasticity of imports and net exports in the short term (β = -0.000651, p = 0.8113). As a result, the null hypothesis—that there is no meaningful short-term relationship—is accepted. Therefore, net exports for the current year are not significantly impacted in the short term by the exchange rate elasticity of imports. On the other hand, there is no statistically significant correlation between the long-term exchange rate elasticity of imports and net exports (β = 0.137841, p = 0.0581). As a result, we agree with the null hypothesis that there is no meaningful long-term link. As a result, net exports in the present year are significantly impacted over the long term by the exchange rate elasticity of exports.

Table 8: Results of the Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.	Result
EXR does not Granger Cause NEX	39	10.2823	0.0003	Uni-directional from EXR to NEX
NEX does not Granger Cause EXR		0.57914	0.5658	
EEX does not Granger Cause NEX	39	0.75184	0.4792	No granger causality between NEX and EEX
NEX does not Granger Cause EEX		0.69148	0.5077	
EEM does not Granger Cause NEX	39	0.49989	0.6110	No granger causality between NEX and EEM
NEX does not Granger Cause EEM		0.51095	0.6045	

Source: Author's Computation, 2024

The causal links between each of the following study variables—NEX, EXR, EEX, and EEM—are displayed in Table 8. A statistical hypothesis test called the Granger causality test is used to evaluate whether one time series can accurately predict another. It looks for correlation patterns via collections of empirical data. To investigate the causative relationships among the interest rate, inflation rate, gross domestic product, and gross fixed capital formation at the 5% level of significance, the results of the pairwise Granger causality test are presented. The outcome shows that the only factor causing net exports in Nigeria is the exchange rate (EXR) Granger. This is because all of the NEXh probability values for the first and second Granger causality directions are below the selected alpha threshold of 5% ($p < 0.05$). Therefore, the null hypothesis, which holds that the exchange rate does not affect net exports (NEX) to Granger, is rejected. Five diagnostic tests were conducted in accordance with the econometric principles of model estimation to assess the stability, precision, and reliability of the estimated model. The results of these tests—which include those for residual normality, specification, heteroskedasticity, serial correlation, and stability—are shown in Table 9:

Table 9: Results of Post Estimation Tests

Diagnostic Test	F-Statistics	Prob.	Remark
Residual normality	0.729100	0.694509	The residuals are normal
Serial Correlation	0.124178	0.8134	No serial correlation in the residuals
Heteroskedasticity	0.441780	0.9355	No heteroscedasticity in the model
Ramsey RESET	2.671771	0.1158	Model is well-specified

Source: Authors' Computation, 2024.

The residual normality test essentially calculates the likelihood that the target variable's residuals will be normally distributed, which would suggest that no more meaningful inferences can be drawn from the target variable. The residual normality test probability from Table 9 is 0.694509, which is significant at the 5% level. The residuals of

the dependent estimated model have a normal distribution as a result. At the 5% level of significance, the hypothesis that there is no serial correlation cannot be rejected, implying that there is no case of serial correlation. Furthermore, at the 5% level of significance, the heteroskedasticity test demonstrates that the model is homoskedastic or does not exhibit heteroskedasticity.

5. Concluding Remarks on Policy and Development Calls

A policy call concerning exchange rates relates to the management or tweaking of Nigeria's exchange rate regime to affect the value of her currency in relation to other currencies, with the goal of achieving particular economic goals such as currency stabilization, inflation control, trade competitiveness enhancement, or external imbalance management. This call raises serious concerns about the economy due to the unidirectional flow of data from the EXR to the NEX, as reported in Table 8. In particular, Table 4 provides evidence of a significant long-term relationship between exchange and net exports, which could have a wide range of effects on trade, investment, inflation, and overall economic stability. This necessitates giving due to both internal and external economic concerns, such as developments in geopolitics and the global financial markets. Because Nigeria has a sizable amount of debt denominated in foreign currencies, calls are made to stabilize the currency, manage external debt, enhance the trade balance, and control inflation.

In addition, the report calls for development on the basis of empirical findings about exchange rates to support long-term growth goals and encourage economic development. The outcome strongly implies that the Nigerian economy is incapable of determining or influencing exchange rates to accomplish particular developmental objectives, such as boosting export competitiveness, drawing in foreign capital, controlling inflation, or promoting economic diversification. Development goals that support economic diversification, attract foreign investment, and foster export growth may not be realized anytime soon. Thus, a plea is made for currency revaluation, float management, and purposeful intervention in the

foreign exchange market to facilitate export-led growth, mitigate external shocks, stabilize the economy, and encourage exports of goods other than oil. Therefore, the study suggests making strategic decisions that leverage currency value to promote economic development and growth, improve export competitiveness, draw in investment, and accomplish more general developmental goals.

A policy call on exchange rate export elasticity entails choices that should be made with the intention of affecting how responsive Nigeria's export volumes are to variations in variables, including exchange rates, international demand, and local production costs. The findings indicate that an increase in the exchange rate results in a negligible increase in Nigeria's net exports; nonetheless, the link between the exchange rate and export elasticity is positive (0.002712) and statistically not significant (p value = 0.4231). This is because changes in these factors affect how sensitive exchange rate export elasticity is to the volume of exports; in particular, the price of exports in relation to the currency exchange rate has continued to be a source of concern. Because of Nigeria's weak currency and production base, which have caused the demand for its goods and services to remain essentially constant (inelastic demand) despite changes in economic variables, the results in Table 7 can be explained.

The outcome also suggests that increasing the number of items produced domestically will not increase exports; rather, it will have a detrimental effect on home consumers and hinder the earnings of foreign cash. Additionally, it conveys crucial information to producers and consumers that calls for deliberate policy changes. For this reason, it is necessary to ensure that exchange rates are export elastic, meaning that even a slight adjustment in price will have a large effect on export volume. Therefore, it is imperative to increase export competitiveness, stabilize export earnings, ensure that trade agreements and tariff changes for exports are feasible, provide export-related subsidies and assistance, and increase productivity and quality. Nigeria's economic resiliency and trade performance will be greatly influenced by this call.

Concerns about how Nigeria's export volumes respond to changes in pricing, exchange rates, and market circumstances are raised in a development call on exchange rate export elasticity. This call has become necessary since Table 7's outcome prevents Nigeria's economy from improving its export capacity to react favorably to shifts in economic factors, thus promoting economic growth and development. The lack of considerable short- and long-term exchange rate export elasticity raises serious concerns about trade competitiveness by impeding Nigeria's efforts to increase export competitiveness, diversify its export items, and stabilize its export earnings. A development request is made for changes to trade policy, investments in industries focused on exports, enhancement of quality and innovation, and infrastructure development.

The sensitivity of Nigeria's import volumes to changes in prices, currency rates, tariffs, and domestic economic conditions is the subject of a policy call on exchange rate import elasticity. The necessity to control the influence of imports on the economy, trade balance, and emerging industries stems from the quantity of imports' susceptibility to changes in price or other economic variables, as well as policy. Even if the depreciated Nigerian currency has not been able to lower the cost of imports or, in the case of high import elasticity, decrease import volumes, the results shown in Table 7 are not close to reaching this goal. As a result, a policy recommendation is made to decrease imports to shield home businesses from overseas competition, particularly in situations where import elasticity is high and home manufacturing may readily replace imports. Because trade deficits put immediate pressure on foreign exchange reserves and the value of the home currency, they must be effectively managed. Because costly imports might result in imported inflation, policy proposals may seek to reduce reliance on imports to improve the trade balance.

The implications of exchange rate import elasticity for issues related to economic growth have made a development call on this topic important. The study's conclusions make it clear that the exchange rate elasticity of imports is negative (-0.000651) and not

statistically significant. This suggests that Nigeria's net exports decline by 0.065% when the EEM increases. This suggests that Nigeria's import volumes are also more susceptible to fluctuations in prices, exchange rates, tariffs, and domestic economic conditions, hence widening the export-to-import gap and favoring imports. Because a high level of imports is vulnerable to external shocks, it is necessary to manage the impact of imports on the economy by fostering domestic industries, supporting more general goals for economic development, encouraging domestic production, supporting domestic alternatives, and encouraging import substitution.

To lessen volatility and create a stable trading environment, the federal government, which acts through the Central Bank of Nigeria (CBN), is advised to adopt consistent and transparent currency rate rules. The Nigerian economy would grow, diversify, and develop if the government promoted stability in macroeconomic variables and implemented growth-oriented and stabilization policies, particularly at the macro level. Depreciating the value of the currency will increase exports and consequently lower imports into Nigeria.

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