



# **Nigeria's Non-Oil Sector and its Impact on Exchange Rate Volatility (1981-2021)**

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## **Authors' contributions**

*This work was carried out in collaboration among all authors. Authors JAB and CUN anchored the introductory part. Authors OHA and CNU discussed the literature. Authors BMO and ROD designed the methods used (Methodology). Authors AAS and TPA worked on results and discussion. Author OAI concluded. All authors read and approved the final manuscript.*

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## **ABSTRACT**

The study investigates the impact of non-oil exports on exchange rate volatility in Nigeria using 40 years of time series data. The study makes use of an autoregressive distributed lagged model as the model for the data estimation. The variables used were found to be stationary at a mixture of level and first difference. The study found that non-oil exports have a negative impact on the exchange rate volatility in Nigeria. A 1% increase in non-oil exports will lead to a 0.64% reduction in exchange rate volatility. This implies that the less volatile the exchange rate becomes, the more interest there is in non-oil exports. This study recommends that it is high time Nigeria as a country diversified its economy and focused on massive investments into other sectors of the economy

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such as Agriculture, Manufacturing, Mining, Art, and entertainment to increase non-oil exports and prevent overreliance on crude oil exports as the only source of foreign exchange earnings. When we diversify the economy, we produce more, become less reliant on imports, and the exchange rate becomes more stable as a result.

*Keywords: Non-oil export; exchange rate volatility; interest rate; oil export.*

## 1. INTRODUCTION

Autarky is a utopian dream as no nation can thrive in it; therefore, participation in trade is vital to the growth and development of economies and facilitates their interconnectedness with other nations. The goal of every nation is to improve the lives of its citizens through engagement in the production of goods and services that are tradable with other nations in the world. The economic theory of comparative advantage states that a country produces goods in which it has a comparative advantage over others, sells them to their trade partners and the rest of the world, and then purchases the goods in which it has a lesser comparative advantage from the rest of the world. Nigeria participates in trading activities, with trade contributing 34 percent of her GDP as of 2019 [1]. Trade facilitates the earning of foreign exchange, regardless of the type of exchange rate regime adopted by a country.

In the 1970s, many countries exited the fixed exchange rate regime, which evolved into the experience of volatility, which has been on an upward trend ever since. This challenge has been a major concern for policymakers and researchers all over the world [2]. The exchange rate, as an important macroeconomic indicator, has significant implications for the health of an economy. Therefore, volatility breeds uncertainty and may adversely affect other macrovariables [3-5]. Although there is no consensus on the specific cause of volatility, these factors are identified as some of its causes. These factors may be time- or country-specific, and they include the composition of capital and the depth of the financial market as determinants of the degree of fluctuation in the exchange rate. Other factors are trade openness, fiscal deficit, foreign debt, level of foreign reserve, monetary policy stability, exchange rate arrangements, and economic growth [5]. Developing and mono-product economies such as Nigeria experience the challenge of fluctuations in exchange rates.

Nigeria was an agrarian economy where agricultural produce such as cocoa, groundnuts,

etc. constituted the majority of exports. After the discovery of oil and the oil boom in the 1970s, the country shifted its focus and became dependent on oil to earn foreign exchange [6]. Oil has remained the country's primary export good for decades. According to the National Bureau of Statistics (NBS) [7], in the first quarter of 2021, oil and other petroleum products had an 85% share of the country's total exports, while for non-oil exports, agricultural goods had 4.37%, raw materials had 1.47%, solid minerals had 0.32%, energy goods had 0.20%, and manufactured goods had an 8.6% share of total exports. With these figures, it is evident that there are challenges with diversification that can limit the country's foreign exchange earnings.

Over the years, Nigeria as a nation has been dependent on earning foreign exchange from oil revenue. The government, through the Central Bank of Nigeria, in a bid to harness the prospects of the non-oil sector and strengthen the Nigerian currency to prevent foreign exchange volatility, adopted several strategies, like the deregulation of external trade and payments and the adoption of a market-determined exchange rate. In the recent strategy adopted by the Central Bank of Nigeria, the RT200 programme was introduced. This strategy is an initiative aimed at raising \$200 billion in foreign exchange earnings from the non-oil sector over a period of 3 to 5 years. The programme is based on five major anchors, and the major anchor of the programme is the Non-Oil Export proceeds repatriation Rebate Scheme. This strategy is expected to facilitate trade while providing incentives for exporters in the non-oil export sector and encouraging the repatriation and sale of export proceeds in the FX market (Banker's Committee, 2022).

Therefore, given the background to the study established, it is important to understand how the activities in the non-oil sector influence the exchange rate. The objective of this study is to investigate the impact of non-oil exports on exchange rate volatility in Nigeria. The rest of the study contains four sections, including a literature review, methodology, results and discussions, and conclusion.

## 2. LITERATURE REVIEW

### 2.1 Theoretical Review

In a free market, supply and demand for foreign currency determine the exchange rate. When capital flows were restricted, a theory of flow was created to represent international exchange rates at that time [8]. According to the asset view of exchange rates, the value of an asset is determined by wealth holders who are willing to hold the stock of money in a particular currency and have globally diversified portfolios [8]. The first elasticity theory is still valid today because the trade account still dominates the balance of payments accounts in some economies, especially those in less developed African nations [8].

The exchange rate of a country's currency is based on its balance of payments, according to the theory of balance of payments. The value of the currency may rise or fall as a result of a favourable or unfavourable balance of payments. As a result, the theory suggests that supply and demand for foreign currency determine the exchange rate [9]. It is important to remember that international trade and investments influence both the supply and demand of foreign exchange. Thus, when a domestic good is exported, there is an increase in the supply of foreign exchange because foreigners purchase domestic currency to pay the exporters of the domestic currency.

When a nation imports something, it creates a need for foreign currency so that it can pay the exporters of the foreign nation in their own currency. This model can include capital flows. For instance, it is reasonable to assume, *ceteris paribus*, that higher interest rates in the home country will attract capital inflow. An increase in interest rates causes the exchange rate to appreciate. In contrast, higher foreign interest rates will, *ceteris paribus*, cause the exchange rate to decline [8].

#### 2.1.1 Mint parity theory

The mint parity theory describes how the gold standard that affect how exchange rates are determined. Each currency is convertible into gold at a set price under the gold standard. In other words, the quantity of gold that can be purchased with one unit of money in one nation is equal to the quantity of gold that can be purchased with one unit of money in another. The rate of exchange between two currencies

that equalizes their respective gold contents is known as the mint parity. . For example, if one ounce of gold costs \$35 in the United States and \$50 in the United Kingdom, the mint parity between the US dollar and the British pound is \$1 = \$0.67 (or 1 pound = 1.5 dollars). In practice, the actual exchange rate between two currencies may deviate from the mint parity due to transaction costs and other factors.

The mint parity idea is predicated on the notion that money may be freely exchanged for gold. According to the mint parity theory, the ratio of the gold content of two currencies will determine the exchange rate between them. Transaction costs, speculation, and interest rates are not included in the mint parity hypothesis. The theory does not account for a number of factors that might influence the real exchange rate between two currencies and is only applicable to nations that use the gold standard. The long-term analysis of exchange rate movement can benefit from the mint parity hypothesis, notwithstanding its flaws [9].

#### 2.1.2 Purchasing power parity

According to the purchasing power parity (PPP) theory, which describes how exchange rates are established, the ratio of the price levels in two nations will ultimately determine the exchange rate between two currencies. This implies that, regardless of the rate of exchange between the two currencies, a basket of items that costs \$100 in the US will equally cost \$100 in the UK. In actuality, a variety of variables, like tariffs, shipping costs, and tax variations, may cause the actual exchange rate between two currencies to diverge from the PPP rate.

The PPP theory is predicated on the notion that international commerce in commodities and services is unrestricted. According to the PPP theory, the ratio of the price levels in the two nations will determine the exchange rate between the two currencies. Transaction costs, speculation, and interest rates are not considered under the PPP hypothesis.

Compared to the mint parity theory, the PPP theory is a more sophisticated account of how exchange rates are set. But it's also more grounded in reality. The PPP theory takes into consideration the fact that there are several factors that might impact the pricing of goods and services in various countries and that commodities and services are not always freely exchanged across nations.

It is also possible to compare the relative buying power of several currencies using this approach. The premise of the PPP theory is that there are no trade restrictions. Trade is really hampered by a multitude of factors, including taxes, shipping expenses, and tariffs. These trade restrictions may thwart the full realisation of the PPP hypothesis. The PPP theory also rests on the premise that prices are gauged uniformly across nations. The PPP hypothesis may not actually be completely realised since there may be variations in how prices are calculated in various nations [9].

### 2.1.3 Balance of payments theory

A detailed account of a nation's economic interactions with the rest of the world during a certain time period is known as the balance of payments theory. Between a nation and its trading partners, it encompasses the inflows and outflows of products, services, capital, and transfer payments. The idea aids in assessing a nation's overall economic health and competitiveness while also shedding light on its ties with other nations on the global stage.

The foundation of the balance of payments theory is the double-entry accounting theory. In a particular account, each transaction is recorded as a credit or debit. The current and capital accounts make up the balance of payments' two primary parts. According to the hypothesis, a positive balance of payments boosts exchange rates while a negative BOP lowers them. This indicates that the supply and demand for foreign currency affect the exchange rate [9,10].

## 2.2 Empirical Review

Oyelami and Ajeigbe [11] investigated the industrial-based impact of exchange rate volatility on non-oil sector exports in Nigeria. In their analysis, they found that there was no long-run relationship between the exchange rate and non-oil exports using the bound co-integration test. Based on the aforementioned results, they were of the opinion that there existed a negative relationship between exchange rate volatility and non-oil exports in the short run, but the relationship did not extend to the long run. This long-term effect was possible due to an industrial mechanism devised by various companies to cope with exchange rate volatility in the long run. As a result, they advised the country to focus more on agricultural exports, where it had a comparative advantage, because exchange rate volatility had no long-term impact on the sector.

Ojomolade, Adejuwon, Adewale, and Akinlabi [12] used time series data for a period of 36 years to evaluate the variables influencing the volatility of foreign currency rates and non-oil exports in Nigeria. The study employed the ARCH and GARCH models to examine the presence of exchange rate volatility. According to the findings, non-oil exports are positively correlated with the foreign exchange rate, bank rate, inflation, and foreign exchange volume, while GDP, M2, and government spending have statistically insignificantly negative coefficients. The ARCH (1) and ARDL models show that inflation and currency rates have the biggest impacts on export volatility. The authors recommended that exports of non-oil items be encouraged by the government's recovery exchange rate policy.

Orji, Abubakar, Ogbuabor, Anthony-Orji, and Ojonta [13] in their study of the relationship between the exchange rate and non-oil exports in Nigeria using the ARDL model. The study revealed that the exchange rate had a positive and significant effect on non-oil exports in Nigeria. Based on their results, they recommended that the Nigerian government provide infrastructure that would improve non-oil exports, cater to the needs of the non-oil export sector more, and persuade the financial institutions in the country to give more loans to the sector.

Ndidi and Alaba [14] employed the Augmented Dickey Fuller (ADF), Johansen co-integration, ARCH, and the ECM to investigate the impact of exchange rate volatility on Nigeria's non-oil export performance and the speed of adjustment using the Error Correction Method (ECM). The results revealed that the exchange rate had a significant, negative, and volatile effect on non-oil exports in Nigeria. Therefore, the authors recommended that exchange rate stability policies that promote poverty alleviation and job creation be implemented.

Shawon, Anande, Iortile, and Mzambe [15] investigated the impact of exchange rate variation on the competitiveness of Nigeria's non-oil exports using the Autoregressive Distributive Lag (ARDL) Model. The result of the analysis revealed the presence of a long-run relationship among the variables in the model. It revealed that an increase in exchange rate variation, degree of openness, and bilateral exchange rate could cause a reduction in the volume of non-oil exports in the long run. The GDP also showed a positive impact on the volume of trade, both in the short and long run. Therefore, the authors

recommended the implementation of policies that would improve the competitiveness of the country's non-oil exports and lead to an increase in the volume of non-oil exports

Obeng [16] examined the issue of exchange rate volatility and its effect on non-traditional exports in Ghana using the autoregressive distributed lag (ARDL) cointegration estimation technique. The results showed that exchange rate volatility negatively affects Ghana's non-traditional exports. They also showed that the harmful effects of exchange rate volatility on non-traditional exports are more severe in the long run than in the short run.

Akanbi, Alagbeb, Yusuf, and Oluwaseyi [17] used the ARCH model and its various extensions (GARCH, TGARCH, and EGARCH), including the Error Correction Model, to examine the impact of exchange rate volatility on non-oil exports. The result of the analysis revealed that exchange rate volatility has a significant negative impact on non-oil export performance in Nigeria. They suggested reducing the overdependence on crude oil as a major export product in Nigeria to protect the economy from various external shocks. It was recommended that the government adopt selective credit control measures to channel credit to other productive sectors of the economy.

Imoughele and Ismaila [18] examined the effect of the exchange rate on non-oil exports using the OLS estimation technique. The results revealed that the growth of non-oil exports in the Nigerian economy is significantly influenced by the effective exchange rate, money supply, credit to the private sector, and economic performance, and that an appreciation in the exchange rate has a detrimental impact on non-oil exports. Therefore, it was recommended that the monetary authority establish policies to promote exchange rate stability and reduce Nigeria's inflationary tendencies.

Having reviewed the literature, it is important to state that some studies have investigated issues around exchange rate volatility vis-à-vis other macroeconomic variables, but exchange rate volatility appears in most as an independent variable. However, in our study, it appeared as a dependent variable. The study therefore investigated the influence of non-oil exports on exchange rate volatility in Nigeria. Several studies have addressed the impact of exchange rate volatility on various macroeconomic

variables, but none have considered exchange rate volatility as a dependent variable. Therefore, this study hopes to fill that knowledge gap.

### 3. METHODOLOGY

#### 3.1 Sources and Measurement of Data

The data for this study were sourced from the CBN bulletin and the World Bank Development Indicators. The exchange rate and interest rate were measured in percentages, while non-oil exports, foreign direct investment, and total government expenditure were captured in the United States of America's dollars.

#### 3.2 Variables Description

- 1 Non-oil exports are a country's exports of goods and services that do not cover petroleum or petroleum products. It is the word used to describe exports of goods and services, which do not include those produced in the petroleum sector.
- 2 Foreign direct investment is the investment of a firm or individual from one country (the home country) in a business or project in another country (the host country). It requires a long-term commitment because the investor aims to establish a long-term interest as well as significant control or influence over the foreign firm.
- 3 Total government expenditure is the overall spending by the government over a specified period, usually on an annual basis. It indicates the total amount of funds allocated to various activities and programmes by the government so as to perform its duties and ensure that citizens are provided with goods and services.
- 4 The interest rate is the cost or price of borrowing money, which is usually expressed in terms of a percentage of the loan amount and the return on investment linked to its lending or deposit. It designates the compensation received by lenders from borrowers or their earnings in exchange for loans.
- 5 An exchange rate is used to determine the value of one currency against another. It indicates the rate at which an exchange or conversion may take place between two currencies.

#### 3.3 Economic A-Priori Expectations

Based on economics theory all independent variables are expected to have positive

relationship with the dependent variable aside the interest rate that is expected to have a negative relationship.

### 3.4 Empirical Model

#### 3.4.1 Theoretical framework

**Export-Led Hypothesis:** An "export-led hypothesis" is a theory of economics suggesting that by focusing on the exports of products and services to other countries, growth and development can be achieved. In this view, exports can raise output, creating jobs and boosting foreign exchange profits that can help expand the economy.

The export-led hypothesis arose as a counterargument to import substitution industrialization (ISI), a popular economic strategy in many developing countries during the mid-twentieth century. By introducing import restrictions and promoting sustainable production, ISI was intended to protect local enterprises from external competition. However, a number of economists argue that this approach results in inefficiencies, excessive costs, and restrictions on access to international markets [9].

Proponents of the Export-led Theory claim that countries, by emphasising exports, would benefit from a range of benefits, including economies of scale, technological advancement, more productivity, external exchange profit, and product diversity in their national economies [19].

#### 3.4.2 Method of estimation

$$\Delta EXRVOL_{t-1} = \varphi_0 + \sum_{i=0}^p \varphi_1 \Delta NEXP_{t-1} + \sum_{i=0}^p \varphi_2 \Delta \ln INT_{t-1} + \sum_{i=0}^p \varphi_3 \Delta FDI_{t-1} + \sum_{i=0}^p \varphi_4 \Delta \ln TGE_{t-1} + \omega_4 NEXP_{t-1} + \omega_4 INT_{t-1} + \omega_3 FDI_{t-1} + \omega_2 \ln TGE_{t-1} + \mu_t \dots (3)$$

On the right-hand side, the expression from  $w_4$  to  $w_1$  shows the long-run relationship among the variables, while the notations from  $\varphi_1$  to  $\varphi_4$  with the summation signs corresponds to the short-run dynamics of the variables. While  $\varphi_0$  represents constant and  $u_t$  is the error term.

## 4. RESULTS AND DISCUSSION

### 4.1 Results and Findings

**Table 1. The arch LM test**

<b>H<sub>0</sub>: No Arch effect</b>		
F-Statistic	1629.655	Prob. F. (0.0000)
Observed R squared	107.543	Prob. Chi-Square (0.0000)

Source: Eviews 10, Authors' Computation

This study adopted Autoregressive Distributed Lag (ARDL) because when the data collected on the variables were subjected to unit root tests, they were found to be a mixture of levels and first difference using Philips Perron (PP) and Augmented Dickey Fuller tests (ADF), i.e., I(0) and I(1) combined. The method is also chosen because of the following advantages: First, it is applicable irrespective of whether the variables under investigation are purely I(0), I(1), or mutually integrated. Second, it does not have the problem of endogeneity. Third, it is appropriate for testing cointegration with the small sample data. Lastly, ARDL estimates the long run and short run simultaneously without losing the long run information [20-23].

From the reviewed theoretical and empirical studies, many variables were identified as the major determinants of non-oil exports. To test the underlying hypothesis, the empirical model below was adapted from the work of Orji, Abubakar, Ogbuabor, Anthony-Orji, and Ojonta [13]:

$$EXRvol = f(NEXP) \tag{1}$$

$$EXRvol = f(NEXP, INT, FDI, TGE) \tag{2}$$

Where:

EXRvol – exchange rate volatility

NEXP - non-oil export volatility,

INT - Interest rate,

FDI - Foreign direct investment,

TGE - Total Government Expenditure

The econometrics form of the model is stated as follows:

**Table 2. Descriptive Statistics**

	<b>EXRVOL</b>	<b>NEXP</b>	<b>INT</b>	<b>FDI</b>	<b>TGE</b>
Mean	108.4421	3391035.	12.47943	2511.535	2494.001
Maximum	415.7200	17802182	26.90000	8841.062	12164.15
Minimum	0.617708	5069.700	6.000000	189.1648	9.636500
Std. Dev.	110.9597	4661122.	4.077670	2533.051	3190.137
Probability	0.026725	0.000002	0.000077	0.007960	0.000336
Observations	41	41	41	41	41

Source: Eviews 10, computed by the Authors'

**Table 3. Unit root tests result**

<b>Variable</b>	<b>Augmented Dickey-Fuller (ADF)</b>		<b>Phillips-Perron (PP)</b>		<b>Remark</b>
	<b>Level</b>	<b>1<sup>st</sup> difference</b>	<b>Level</b>	<b>1<sup>st</sup> difference</b>	
EXRVOL	0.9853	-4.2880***	0.587055	-4.2465***	I(1)
NEXP	-0.2055	-4.0197***	-2.9281	-4.23480***	I(1)
INT	1.2507**	-4.9991	1.9593*	-4.98888	I(0)
FDI	-2.2153	-5.2916***	-2.2153	-5.2913***	I(1)
TGE	4.1811***	1.45094	5.6101**	-1.11696	I(0)

Source: Eviews 10, Computed by the Authors.

After demonstrating the presence of exchange rate volatility between the naira and the dollar, ARCH-type models were calculated, and the results are shown in Table 1. Since the probability is greater than 5%, the ARCH coefficient (0.6082 in the model) is not statistically significant. This suggests that the exchange rate's past volatility is not a major influence on the present exchange rate. The GARCH coefficient (0.5603), which illustrates the GARCH effect, is nonetheless statistically significant. This indicates that earlier news pertaining to volatility has an explanatory influence on present volatility. This is analogous to Adeoye and Atanda's [24] and Olufayo and Fagite's [25] results. The sum of the ARCH and GARCH coefficients (0.5399) implies an initial shock followed by a gradual return to the mean.

#### 4.2 Descriptive Statistics

Table 2 describes the data on the exchange rate, non-oil exports, interest rates, foreign direct investment, and total government expenditure. The mean, standard deviation, minimum, and maximum values of the data are shown. The decision rule is that the data is said to be

consistent as long as the means and the median values of the data lie within the minimum and maximum values of variables.

#### 4.3 Unit Root Tests

The above test is a test for the stationarity of the data. The null hypothesis is that there is no unit root, as this implies that the data is stationary. Note: asterics '\*', '\*\*', and \*\*\*' show significance at 1%, 5%, and 10% levels of significance, respectively. We reject the null hypothesis if the tabulated value is greater than the critical value at a chosen level of significance, which is 5% as applied to this study. The result shows that some variables are stationary at the first difference, while some other variables are stationary at levels. They are stationary because both the ADF and the PP calculated statistics are all less than the critical values of the ADF and Phillips-Perron. The fact that the data are stationary implies that they are good enough to be used for estimation. The mixture of statistics at both the first difference and at levels implies that the Autoregressive Distributed lag Model is suitable as an estimation technique in this study.

#### 4.4 Causality Tests

**Table 4. Pairwise Granger Causality Tests**

Sample: 1981 2021  
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EXRVOL does not Granger Cause NEXP	39	11.1203	0.0002
NEXP does not Granger Cause EXRVOL		6.12988	0.0053
INT does not Granger Cause NEXP	39	0.05304	0.9484
NEXP does not Granger Cause INT		0.24142	0.7869
INT does not Granger Cause EXRVOL	39	0.56873	0.5715
EXRVOL does not Granger Cause INT		0.90341	0.4147

Source: Eviews 10, Authors' computation

#### 4.5 Bounds Test

Table 5 shows that the calculated F-statistics are greater than the critical values of the upper bounds at all levels of significance: 10%, 5%, 2.5%, and 1%. The result therefore shows we have six vectors that are co-integrating, which means a long-run relationship exists among all the variables over the period of this study, i.e., 1981–2021.



**Table 5. Bounds Test**

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	8.504070	10%	2.2	3.09
K	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37
Actual Sample Size		40	Finite Sample: n=40	
		10%	2.427	3.395
		5%	2.893	4
		1%	3.967	5.455

Source: Eviews 10, Authors' computation

**4.6 VAR Lag Order Selection**

The test above shows that the lag criteria of 1 using SC or 3 using AIC are suitable for the estimation of the ARDL model in this study.

**4.7 Long run Results**

The result in Table 7 shows that exchange rate volatility (EXRVOL) has a significant negative relationship with non-oil exports (NEXP) in Nigeria. The relationship is statistically significant at the 1% level, as it further shows that a 1% increase in non-oil exports will lead to a 0.64% reduction in exchange rate volatility. This implies that the higher the volume of non-exports, the lower the volatility of the exchange rate. When the volume of non-oil exports increases, the demand for naira will increase, as this implies that the value of naira will appreciate against the

US dollar and other foreign currencies. While interest rates show a significant negative relationship with the exchange rate volatility in Nigeria, foreign direct investment also shows a negative relationship with the exchange rate volatility in Nigeria. The total government expenditure has been shown not to have a significant relationship with the exchange rate volatility in Nigeria.

The findings show that all the independent variables except the total government expenditure are not in line with the a priori expectations, which agree with the work of Oyelami and Ajeigbe [11] and Akanbi et al. [17]. The R-square results showed that 99% of the changes that had taken place in the dependent variable were explained by the changes in the independent variables.

**Table 6. VAR lag order selection criteria**

Endogenous variables: NEXP EXRVOL INT FDI TGE

Exogenous variables: C

Sample: 1981 2021

Included observations: 38

Lag	LogL	LR	FPE	AIC	SC	HQ
0	10.94039	NA	5.03e-07	-0.312652	-0.09718	-0.235989
1	148.7596	232.1166	1.35e-09*	-6.250508	-4.957677*	-5.790528*
2	165.3824	23.62176	2.25e-09	-5.809599	-3.439408	-4.966303
3	201.4505	41.76306*	1.52e-09	-6.392130*	-2.94458	-5.165518

Source: Eviews 10, Authors' computation

**Table 7. Long run Results**

ARDL Long Run Form and Bounds Test

Dependent Variable: EXRVOL

Selected Model: ARDL (1, 1, 0, 0, 0)

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
NEXP	-0.64	0.08	-7.24	0.00***
INT	-0.25	0.1	-2.44	0.02***
FDI	-0.44	0.12	-3.46	0.00***
TGE	0.21	0.13	1.53	0.13
C	2.52	0.41	6.12	0.00***

<i>R-squared</i>	0.998	<i>Mean dependent var</i>	1.601
<i>Adjusted R-squared</i>	0.989	<i>S.D. dependent var</i>	0.839
<i>S.E. of regression</i>	0.086	<i>Akaike info criterion</i>	-1.907
<i>Sum squared resid.</i>	0.224	<i>Schwarz criterion</i>	-1.520
<i>Log likelihood</i>	47.05	<i>Hannan-Quinn criterion</i>	-1.762
<i>F-statistic</i>	470.2965	<i>Durbin-Watson stat.</i>	2.109689

Prob(F-statistic) 0.000000

Source: Eviews 10, Authors' computation

**Table 8. Correlation test**

**Breusch-Godfrey Serial Correlation LM Test**

F-statistic	2.475113	Prob. F(2,29)	0.1018
Obs*R-squared	5.832333	Prob. Chi-Square	0.0541

Source: Eviews 10, Authors' Computation

**4.8 Correlation Test**

To avoid a spurious regression and to establish the fitness of the data for estimation, tests such as this are carried out. The non-significance of the result shows that the null hypothesis of no serial correlation is accepted. The need for the test is to ensure the data used for the study are reliable enough to make economic projections.

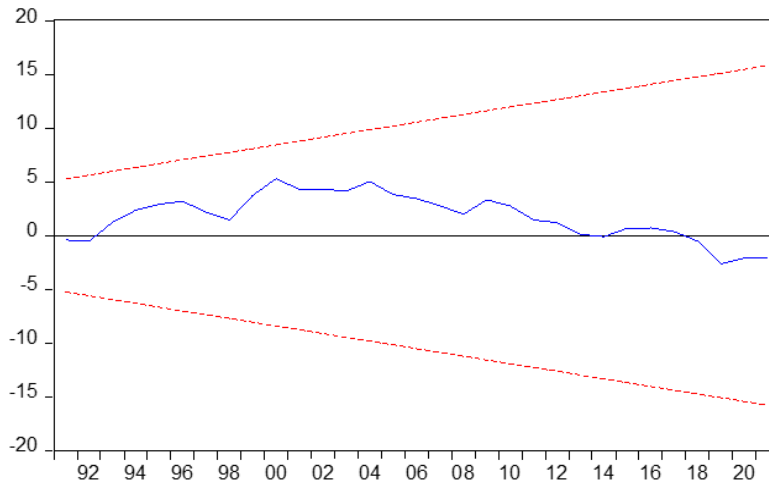
**4.9 Stability Test**

The non-significance of the result shows that the null hypothesis of no serial correlation is accepted. The need for the test is to ensure the data used for the study are reliable enough to make economic projections, as it is concluded that the model is stable within a 5% level of significance.

**4.10 Discussion**

Utilising time series data spanning from 1981 to 2021, the study sought to analyse the relationship between non-oil exports and exchange rate volatility in Nigeria. The researchers examined the implications for Nigeria's economy by using an autoregressive distributed lagged model to examine how non-oil exports affect exchange rate volatility. The results showed how crucial it is to diversify the nation's economy and lessen its reliance on crude oil exports.

Data Analysis: To start the analysis, unit root tests—more specifically, the Philips Perron and Augmented Dickey Fuller tests—were run on the data that had been gathered. These tests assisted in determining whether the data series



**Fig. 1. Stability test**

Source: *Eviews 10, Authors' Computation*

was stationary or whether it needed differencing to become stationary. The findings showed a mixture of levels and first-order differences in the data, indicating the need for subsequent modelling to take both into account.

**Impact of Non-Oil Exports on Exchange Rate Volatility:** The main objective of the study was to ascertain the association between non-oil exports and exchange rate volatility in Nigeria. The results showed that exports other than oil had a negative impact on exchange rate volatility. In other words, the exchange rate stabilised as non-oil exports increased. According to this outcome, Nigeria's exchange rate may be more stable if non-oil exports are prioritised more.

**Relationship with Interest Rates:** The study also looked at how interest rates and non-oil exports relate to one another. An important inverse relationship between interest rates and non-oil exports in Nigeria was found through analysis. This finding implies that higher interest rates deter non-oil export activities, potentially impeding efforts to diversify. Therefore, lowering interest rates could encourage non-oil exports and support financial stability.

**Implications and Advice:** According to the study's findings, Nigeria's exchange rate volatility is a sign that the country depends too heavily on oil exports, which compromises the stability of the economy. The researchers advise Nigeria to diversify its economy in order to lessen this vulnerability by making significant investments in

fields like agriculture, manufacturing, mining, the arts, entertainment, and other non-oil industries. Promoting non-oil exports will help the nation become less reliant on crude oil as its only source of foreign exchange.

The study's conclusions highlight how critical it is for Nigeria to diversify its economy and foster growth in other areas in order to produce long-term sources of income. In addition to reducing the risks brought on by exchange rate volatility, this strategy would promote long-term economic stability and growth.

## 5. CONCLUSION

The study investigated the impact of non-oil exports on exchange rate volatility in Nigeria using time series data that ranges from 1981 to 2021. The study used an autoregressive distributed lagged model as the model for the data estimation. The study found that non-oil exports have a negative impact on the exchange rate volatility in Nigeria. The more non-oil exports, the higher the production level. This shows that the less volatile the exchange rate becomes, the more interest there is in non-oil exports. Interest was found to have had a significant negative relationship with non-oil exports in Nigeria. When interest rates increase, foreign investors will be attracted, and non-oil exports will increase following an increase in foreign direct investment.

It can be concluded that the volatility of the exchange rate indicates that continued reliance on oil exports is not safe for the economy as the

economy becomes more unstable, as in the present case of Nigeria.

This study recommends that it is high time Nigeria as a country diversified its economy and focused massive investments into other sectors of the economy like Agriculture, Manufacturing, Mining, art, entertainment, and so on in an effort to increase its non-oil exports and prevent overreliance on crude oil exports as the only source of foreign exchange earnings. When we diversify the economy, we produce more products, become less reliant on imports, and the exchange rate becomes more stable as a result.

### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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