
EXCHANGE RATE VOLATILITY, TRADE OPENNESS AND NIGERIAN ECONOMIC GROWTH.

BY

Joseph Ojo EKIRAN (PhD)

ekiran.joseph@bouesti.edu.ng

Department of Economics

Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti

&

Ireti Olamide OLASEHINDE

olasehinde.ireti@bouesti.edu.ng

Department of Economics

Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti

&

Olusesan Samuel AFOLABI (PhD)

afolabi.olusesan@bouesti.edu.ng

Department of Economics

Bamidele Olumilua University of Education, Science and Technology, Ikere-Ekiti

Abstract

This study examines the existing relationships among exchange rate volatility, trade openness and Nigerian economy from 1981 to 2021, using Autoregressive Distributed Lag (ARDL) bound and Pairwise Granger causality technique to achieve the stated objectives. The findings revealed a long-run relationship among the research variables. It was discovered that external reserve had positive significant short-run and long-run effects on Nigerian economy, while exchange rate volatility had negative short-run significant effect on economic growth. Unidirectional causal relationship was established between exchange rate volatility and economic growth as well as between trade openness and economic growth. A bidirectional causality was established between total tax on goods and economic growth in Nigeria. It is therefore recommended that government should come with policies to regulate exchange rate for naira to regain more strength against foreign currencies and as a result, promoting trade openness. Also, government should encourage more export through infant industrial promotion and economic diversification to support trade openness in the process of attaining economic growth in the country.

Keywords: Exchange rate, exchange rate volatility, trade openness, economic growth, Autoregressive Distributed Lag (ARDL) Bounds.

Introduction

The flexibility in the world's exchange rate has called for adequate attentions, leading to a focal point debate among the researchers. This macroeconomic issue has posed serious threats on businesses that are vital for economic growth and stability. A volatility in exchange rate usually poses indeterminate risk on investment opportunities, causing unsteady macroeconomic impact (Mahmoud and Ali, 2011).

Volatility in foreign exchange rate has become an issue of concern since it increases Nigerian cost of importing goods, leading to vigorous rise in the general price level (Gbadamosi, 2017). It is inconsistent and at times it is exchanged for at official and parallel exchange rates (Gray, 2020).

Having measured primarily exchange rates in terms of the US Dollar, it is a critical macroeconomic variable of the Nigerian economy, and is one of the challenges facing most developing economies because it is dynamic in nature. However, its stability or flexibility is a strong indication of how healthy, progressive and buoyant the economy is in the face of external shocks inherent during trade openness. Exchange rate is an influential factor in the pricing of local goods and services, as well as imported goods and services on the ground of international trade. However, over some decades, Nigeria has persistently witnessed instability of her exchange rate (Nnamdi and Uche, 2019).

According to Yakub, Sani, Obiezue, and Aliyu (2019), exchange rate between Naira and Dollar is highly unstable, leading to wide fluctuation of currencies both at official price and parallel market. After Structural Adjustment Programme (SAP) in 1986, exchange rates between Nigerian currency and US dollar have witnessed increases, leading to devaluation of our currency.

Trade openness is the process of removing restrictions on international trade which may take the form of removal of tariffs, abolition of import quotas, subsidies and non-tariff barriers to trade and multiple exchange rates. Through trade openness, developing countries would not only enjoy variety of products across the globe, but also, technological innovations which outgrowths the economy (Nwosa, Ogbuagu & Fasina, 2019). But some scholars like Armah, Brafo-Insaidoo and Akapare (2015) opined that, trade openness is unfavorable to growth because it breeds international disparities by restricting African countries to simple producers of primary products and consumers of trade's products from industrialized countries.

However, the Nigerian economy is facing serious challenges as a result of instability in her foreign exchange rate in the parallel market (Kelikume and Nwani, 2019). Exchange rate is revolutionary, leading to poor purchasing power of naira, increased price level of goods and services etc. (Alagidede and Ibrahim, 2017).

Conclusively, this study confirmed that some earlier studies failed to include vital variables in research models. For instance, Adokwe, Agu and Maduke (2019) and Musa (2020) omitted value added tax (VAT) in model specification for studying trade openness and economic growth. This is the gap filled by the study as identified. At the same time, the study presented recent research report covering the period between 1981 and 2021.

Three (3) research questions are raised accordingly; what is the relationship among economic growth, volatility of exchange rates and Nigerian openness of trade? What is the effect of trade openness on Nigerian economy? What are the directions of causality among exchange rate volatility, trade openness and economic growth in Nigeria?

Theoretical Literature

Related theories to this study include Dornbush Exchange Rate Overshooting, monetary growth theory and Hechscher-Ohlin's theory.

Theory of Dornbush Exchange Rate Overshooting

Overshooting in exchange rate was originated by Dornbusch (1976) to mainly specify the unnecessary fluctuation of the exchange rate in response to a change in the monetary supply. His view of overshooting was linked to price thickness which may contribute to how the high volatility is displayed by nominal exchange rates. Therefore, the sticky price monetary model of Dornbusch indicates that prices should neither be totally flexible nor totally fixed in order to pave way for its efficiency.

Monetary growth theory

It is argued that exchange rate volatility hinders productivity growth whereas financial development stimulates innovation and then foster productivity growth. Hence, during episodes of exchange rate volatility, it is expected that as the financial sector develops, the level of innovation is unaffected adversely, thereby leading to an increase in the level of productivity growth. This theory is not in support of volatility of exchange rates because of the economic insecurities that may arise aftermath (Aghion, Bacchetta, Ranciere, and Rogoff, 2009).

The Hechscher-Ohlin's theory of International trade

This theory posited that through trade openness, countries can trade with each other. Capital should produce relatively more of capital-intensive goods, while labour should produce relatively more of the labour-intensive goods, that is, both means of production should be encouraged for productivity, through specialization, which can lead to economic growth (Edward, 1995).

Empirical Literature

Nguyen, Thu-Trang and Toan (2022) employed a Vector Autoregression model and Granger causality test to investigate the causal relationship between trade openness and real effective exchange rate volatility in Vietnam between 2004 and 2020. Results showed that trade openness has a bi-direction Granger causality with effective real exchange rate volatility at the 1% significance level in the country. Also, the effect of trade openness on real exchange rate volatility is positive but real exchange rate fluctuations have a negative effect on trade openness. The findings showed that an increase in economic growth reduces real effective exchange rate volatility and increases trade openness in Vietnam.

Joshua, Oladipo and Umozurike (2022) examined impact of exchange rate volatility on economic growth in Nigeria from 1981 to 2020. ARCH/GARCH model and ARDL estimation were used to analyze the data collected. Findings revealed that the effect of exchange rate volatility was positive and statistically significant on Nigerian economy.

Akinwolere (2021) worked on impact of exchange rate volatility on Nigerian economy between 1986 and 2019, using Vector Error Correction Mechanism. Findings showed that exchange rate volatility significantly impacted economy, supported by Attah-Obeng, Enu, Osei-Gyimah and Opoku (2013). It has a positive impact on inflation, unemployment and balance of trade but a negative impact on investment.

Nkemdilim and Azuka (2021) examined the effect of persistent exchange rate fluctuations on Nigerian economic performance between 1986 and 2019. Autoregressive distribution lag (ARDL) technique was used to achieve the stated objective(s). Findings showed that the exchange rate had significant impacts on Nigerian economic growth in the long run, which established that excessive exchange rate fluctuations are harmful to Nigerian economy.

Soro and Aras (2020) explored the effect of currency exchange's movements on Nigerian external reserves from 1980 to 2019. The study adopted Autoregressive Distributed Lag model to analyze the data collected. They suggested that exchange rates partially differ in magnitude and in relation to negative and positive directions. Results showed negative trend effect of exchange rate on reserves and was statistically insignificant in the long-run while it showed positive shock of exchange rate on reserves which was statistically significant.

Morina, Hysa, Ergun, Panait, and Voica (2020) evaluated impact of exchange rate fluctuation on the economic growth in European countries, Central and Eastern (CEE) specifically, using annual data covering the period of 2002 and 2018 of the CEE countries in the study. The findings revealed a negative effect exchange rates on their economic growth, using panel data.

Odejimi, Isikhuemen, and Nosa (2020) examined impact of exchange rate movement, import demand on economic growth in Nigeria, spanning from 2003 to 2017, using the Autoregressive Distributed Lag (ARDL) technique. The outcome showed a negative ECM value, indicating a long-term association between the variables. As shown by the relatively error correction terms, around 7 percent (7%) of the annual adjustment were, showing that the adjustment process is slow.

Adokwe, Agu and Maduke (2019) studied the consequence of exchange rate volatility on foreign direct investment. Having employed Generalized Autoregressive Conditional Heteroscedasticity technique, unit root test on the series, and the 2-Stage Least Square methods, findings revealed a negative significant effect of exchange rate volatility on Nigerian foreign direct investment between 1986 and 2016.

Nwosa, Ogbuagu and Fasina (2019) examined the relationship between trade openness and country size in two Africa countries (Nigeria and Benin Republic), using data from 1970 to 2018, whereby trade openness, foreign direct investment, country size and official exchange rate were the variables, using ARDL for the analysis. Findings revealed a negative and significant relationship between trade openness with Nigeria's size while it was negative and insignificant in Benin Republic for the period covered.

Yakub, et al. (2019) examined impact of exchange rate volatility on trade flows in Nigeria, using data between 1997 and 2016. GARCH model was used among the variables to achieve the objectives. From the findings, a long-run relationship was established among the variables through the ARDL bounds test approach. Also, findings showed negative impact of exchange rate volatility on trade flows in the short-run. Also, results indicated that exchange rate volatility did not Granger cause the import.

Lyndon and Ikechukwu (2019) examined the effect of exchange rate volatility and trade balance on Nigerian economy between 2000 and 2017. Multiple regression analysis technique was made used of to achieve the objective of the study. Findings showed that exchange rate exhibited positive effect on economic output. Trade balance had insignificant

effect on economic growth, but inflation had insignificant negative effects on Nigerian economy.

CBN (2019) put up an investigation of Nigerian exchange rate movement from 1986 to 2019. The study showed a causal relationship between the exchange rate movements and economic growth. Having analyzed the data, exchange rate had persistent and depreciation trend with GDP. In this framework, the drive of exchange rate in the 1990s was trended with economic growth, and showed some instabilities till today.

Barguelli, et al. (2018) examined impact of exchange rate volatility on economic growth. They used a sample of 45 developing countries from 1985 to 2015, using Generalized Method of Moment's estimators. From the findings, the effect of exchange rates depends on the governments in power at which the variable is in operation.

Achu (2018) examined responsiveness of trade openness to exchange rate in Nigeria, using annualized data from 1981 to 2014. OLS regression technique was employed and discovered that exchange rate drives trade openness. The research findings showed that Real Exchange Rate (REXR) exhibited positive and significant effect on volume of export and imports in Nigeria. Real exchange rate (REXR) exhibits a positive and significant influence on trade openness in Nigeria.

Umaru, Aguda and Nordiana (2018) examined the effects of exchange rate volatility on economic growth of West African English-speaking countries between 1980 and 2017. They used Panel Data Regression analysis to achieve their objective(s). Results showed that real exchange rate is statistically significant in West Africa English-speaking. Also, it showed a negative relationship between real exchange rate and GDP in West African English-speaking countries.

Armah, et al. (2015) investigated the connection between trade openness and economic growth in Ghana, using data from 1970 to 2014. Variables employed include trade openness, foreign direct investment, country size and official exchange rate. Cointegration technique was employed to analyze the variables. Findings revealed that trade liberalization had positive significant connection with imports both in long and short-run. Results also revealed that trade liberalization granger caused economic growth but economic growth did not granger cause trade liberalization.

Data and Methodology

Model specification

This study employed Autoregressive Distributed Lag (ARDL) cointegration to examine the effect of trade openness and exchange rate volatility on Nigerian economy. This study relied on the strength of monetary growth theory and adopted the empirical works of Adokwe, Agu and Maduke (2019); Musa (2020) and Chiadikobi, et al. (2022) which were modified by including taxes on goods, called value added tax (VAT) to the terms of variables used. The functional and econometric forms of the research model are as follows:

$$\text{GDP} = f(\text{EXCR}, \text{OPN}, \text{EXRES}, \text{NTAXGS}) \dots\dots\dots 1$$

$$\text{GDP} = \alpha_0 + \alpha_1\text{EXCR} + \alpha_2\text{OPN} + \alpha_3\text{EXRES} + \alpha_4\text{NTAXGS} + e \dots\dots\dots 2$$

Where: GDP = Gross domestic product

EXCR = Exchange rate volatility proxy by exchange rate

OPN = Openness of Trade

EXRES = External reserves

NTAXGS = Total taxes on goods is proxy by value added tax (VAT).

$\alpha_0, \alpha_1 - \alpha_4$ = Intercept and parameters to be estimated.

Results Analysis and Discussions

Descriptive Analysis of Data Set:

Table 1: Descriptive Statistics

	EXCR	EXRES	GDP	NTAXGS	OPN
Mean	3.596759	22.91813	25.61860	1.239748	3.352996
Median	4.711600	22.77482	25.37639	1.458615	3.518091
Maximum	6.000375	24.69356	27.06627	2.014903	3.975561
Minimum	-0.478036	20.65390	24.04658	0.000000	2.212660
Std. Dev.	2.008438	1.387640	0.959996	0.475141	0.494560
Skewness	-0.805936	-0.172611	0.122285	-0.685877	-0.969813
Kurtosis	2.383182	1.462713	1.451294	2.516467	2.923756
Jarque-Bera	5.088429	4.240816	4.199602	3.614003	6.436936
Probability	0.078535	0.119983	0.122481	0.164146	0.040016
Observations	41	41	41	41	41

Source: Authors' Computation, 2023.

Table 1 shows the descriptive statistics where the mean which ranged from 1.239748 (NTAXGS) to 25.61860 (GDP), standard deviation has positive values for all the variables, skewness showed positive and negative values where only GDP has only the normal skewness (0.122285), the kurtosis has values lesser than the normal value of 3, making all the variables platokurtic. Based on Jarque-Bera probability, all the variables (EXCR, EXRES, GDP, NTAXGS) are normally distributed except OPN (0.040016) as they have p-values greater 5% significance level.

Criteria for selecting Lag:

Table 2: Lag selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2096.700	NA	3.38e+47	123.6294	123.8539	123.7060
1	-1933.607	268.6237*	1.02e+44*	115.5063*	116.8531*	115.9656*
2	-1909.000	33.29168	1.16e+44	115.5294	117.9985	116.3715
3	-1884.483	25.95904	1.58e+44	115.5578	119.1493	116.7826

Source: Authors' Computation, 2023.

Table 2 shows five (5) criteria such as LR, FPE, AIC, SC and HQ with different Lags, ranging from 0 to 3. Thus, Lag 1 would be selected for having the common Lag.

Unit Root Tests for Stationarity of Variables:

Table 3: Unit Root Test

Variable	Augmented Dickey-fuller Test				I(d)	Philip-Peron Test				I(d)
	At Level		At 1 st difference			At Level		At 1 st difference		
	Stat	C.V.	Stat	C.V.		Stat	C.V.	Stat	C.V.	
GDP	-3.178919	-3.526609	-4.633995	-3.529758	I(1)	-3.085472	-3.526609	-4.593165	-3.529758	I(1)
EXCR	-1.388487	-3.526609	-5.750373	-3.529758	I(1)	-1.430189	-3.526609	-5.747524	-3.529758	I(1)
OPN	-1.977020	-3.526609	-8.015062	-3.529758	I(1)	-1.825349	-3.526609	-8.049815	-3.529758	I(1)
EXRES	-2.884484	-3.529758	-5.742091	-3.533083	I(1)	-3.154978	-3.526609	-5.584908	-3.529758	I(1)
NTAXGS	-3.283030	-3.529758	-6.915691	-3.533083	I(1)	-3.901944	-3.526609			I(0)

Source: Authors' Computation, 2023.

Table 3 shows Augmented Dickey-Fuller and Philip-Peron unit root tests. It obviously showed that all the variables in Augmented Dickey-Fuller were stationary of the same order one (1), while Philip-Peron showed order one (1) for GDP, EXCR, OPN and EXRES, and order at level for NTAXGS. Based on the results, Autoregressive Distributed Lag (ARDL) bound would be used by the authors to find answers to the research questions raised.

Testing for the long-run or short-run relationship among the variables:

Table 4: Autoregressive Distributed Lag (ARDL) Cointegration

H₀: Long-run relationship does not exist/Short-run relationship does not exist

H₁: Long-run relationship exists

T-statistics	Value	K
f-stat	6.373033	4
Critical Value Bounds		
Level of significance	I(0) Bounds	I(1) Bounds
10%	2.2	3.09
5%	2.56	3.49
2.5%	2.88	3.87
1%	3.29	4.37

Source: Authors' Computation, 2023.

Table 4 exhibits the ARDL cointegration results which indicated that f-statistics is 6.373033. When compared the f-statistical value with the upper bounds values I(1) at all the levels of significance (3.09, 3.49, 3.87 and 4.37), there exists a long-run relationship among the variables because the f-statistics figure (6.373033) is higher than the identified upper bound critical values. As a result, H₀ will be rejected and accept H₁, meaning there is long-run relationship among the variables employed.

ARDL Cointegration short-run and Long-run estimates:

Table 5: ARDL Short-run and Long-run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(EXCR)	-0.139143	0.063587	-2.188223	0.0363
D(OPN)	0.016699	0.070385	0.237246	0.8140
D(EXRES)	0.106006	0.047846	2.215579	0.0342
D(NTAXGS)	-0.221906	0.189122	-1.173362	0.2496
CointEq(-1)	-0.284158	0.042642	-6.663756	0.0000
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EXCR	0.122874	0.131071	0.937462	0.3558
OPN	-0.353859	0.280259	-1.262614	0.2161
EXRES	0.881666	0.161569	5.456895	0.0000
NTAXGS	-0.780932	0.671197	-1.163492	0.2535

Source: Authors' Computation, 2023.

Table 5 shows the ARDL cointegration where the results in both short and long-run were exhibited. From the 1st segment of the analysis, it showed that exchange rate (EXCR) has negative significant short-run effect on economic growth, openness of trade (OPN) has insignificant short-run effects on the economic growth, external reserve (EXRES) has positive

significant short-run impact on economic growth, while total tax on goods has insignificant effect on the economy. However, all the variables in the long-run showed insignificant effects except external reserve (EXRES) which has positive significant impact on the economic growth in Nigeria within the period of study.

The error correction term meets the required condition in which the coefficient is negative (-0.284158) with p-value (0.0000) which is less than 5% level of significance, and this shows there is long run causality between the dependent and independent variables. The ECM showed that the equilibrium adjustment of speed in the model is -0.284158. This implies that about 28.4% of the current periods are corrected in the long-run, indicating the model convergence.

Table 6: Breusch-Godfrey Serial Correlation LM Test

H₀: There is no serial correlation in the model

H₁: There is serial correlation in the model

F-Statistic	0.28064	Prob. F(1,30)	0.6004
Obs*R-squared	0.370226	Prob.Chi-square (1)	0.5429

Source: Authors' Computation, 2023.

Table 6 shows the serial correlation test of the study. The result showed that the value of the f-statistic is 0.28064 while the p-value is more than 5% at 0.6004. Based on this, the null hypothesis of no serial correlation is accepted, meaning the model can be relied upon for making inferences and valid policy recommendations.

Table 7: Heteroskedasticity Test: Breusch-Pagan-Godfrey

H₀: There is no heteroscedasticity in the model

H₁: There is heteroscedasticity in the model

F-Statistic	1.232580	Prob. F(1,30)	0.3136
Obs*R-squared	9.652949	Prob.Chi-square (1)	0.2902

Authors' Computation, 2023.

Table 7 shows the heteroscedasticity test of the study. The result showed that the value of the f-statistic is 1.232580 while the p-value is more than 5% at 0.3136. Based on this, the null hypothesis of no heteroscedasticity is accepted, meaning the model can be relied upon for making inferences and valid policy recommendations.

Figure for testing the stability of the model:

Cumulative Sum (CUSUM)

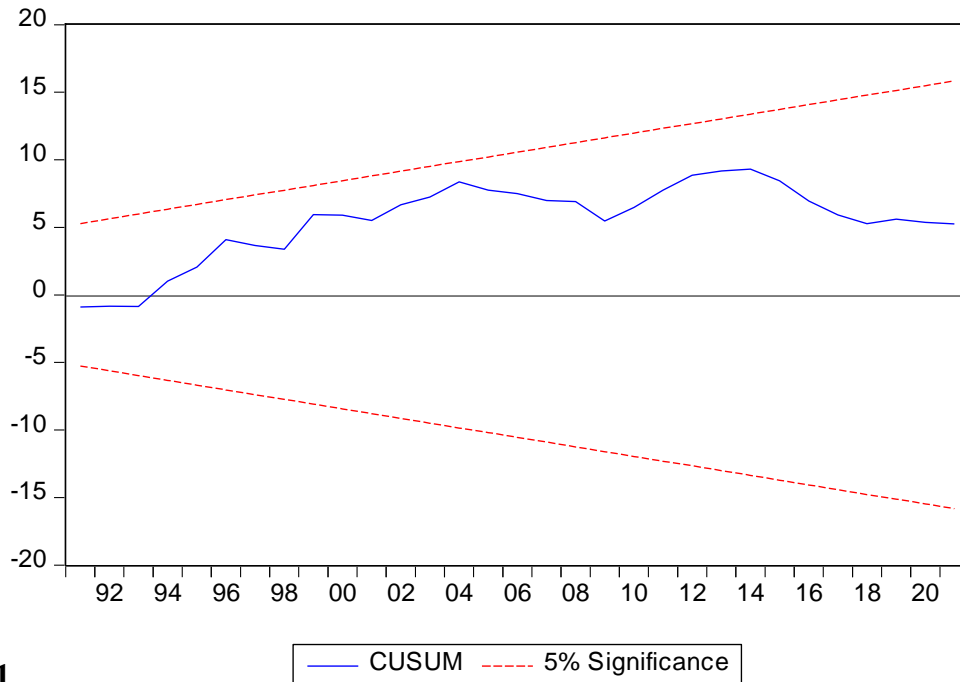


Figure 1

From figure 1, the mean line starts from figure zero (0). The cumulative sum line (continuous line) trends toward the mean line within the two broken lines as displayed in the figure confirms the stability of the estimated model in both the short-run and long-run in the study. As the cumulative outcome trends from the lag time to the current period and forecasting to the future time, the result displays stability during the study period.

Cumulative Sum of Square (CUSUM-q)

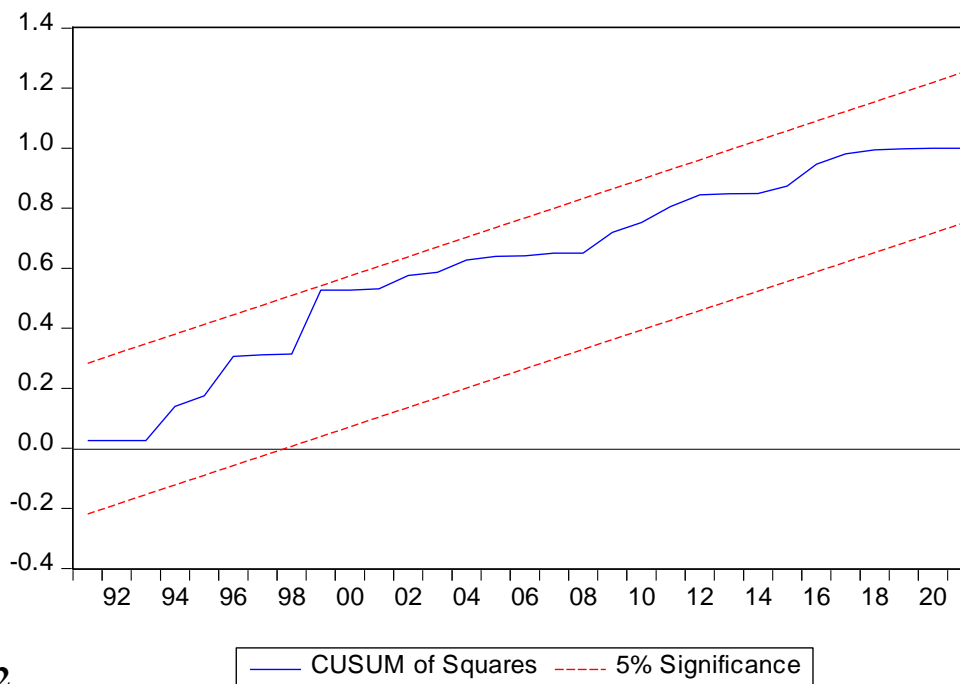


Figure 2

This figure indicates the cumulative sum of square (CUSUM-q) in which the stability in the model was determined and was found to be stable both in the short-run and long-run in the study.

Granger Causality Analysis:

Table 8: Granger causality

Null Hypothesis	Obs.	f-statistic	Prob.	Decision
EXCR does not Granger Cause GDP	40	22.2878	3.E-05	Unidirectional causality
GDP does not Granger Cause EXCR		0.35727	0.5537	
OPN does not Granger Cause GDP	40	12.2223	0.0012	Unidirectional causality
GDP does not Granger Cause OPN		1.27146	0.2668	
EXRES does not Granger Cause GDP	40	30.0826	3.E-06	Unidirectional causality
GDP does not Granger Cause EXRES		0.18529	0.6694	
NTAXGS does not Granger Cause GDP	40	16.0744	0.0003	Bidirectional causality
GDP does not Granger Cause NTAXGS		4.18687	0.0479	
OPN does not Granger Cause EXCR	40	0.28722	0.5952	No causality
EXCR does not Granger Cause OPN		1.47510	0.2322	
EXRES does not Granger Cause EXCR	40	0.00572	0.9401	Unidirectional causality
EXCR does not Granger Cause EXRES		12.3608	0.0012	
NTAXGS does not Granger Cause EXCR	40	1.17539	0.2853	Unidirectional causality
EXCR does not Granger Cause NTAXGS		5.79108	0.0212	
EXRES does not Granger Cause OPN	40	0.05103	0.8225	No causality
OPN does not Granger Cause EXRES		1.57430	0.2175	
NTAXGS does not Granger Cause OPN	40	0.21180	0.6481	No causality
OPN does not Granger Cause TAXGSN		0.51012	0.4796	
NTAXGS does not Granger Cause EXRES	40	11.1976	0.0019	Bidirectional causality
EXRES does not Granger Cause NTAXGS		10.9826	0.0021	

Source: Authors' Computation, 2023.

Table 8 states that there was unidirectional causality between exchange rate volatility and Nigerian economy, between openness of trade and economic growth, between external reserves and economic growth, between exchange rate volatility and external reserves and between exchange rate volatility and total tax on goods. From the analysis, GDP did not granger cause any of the variables but the variables such as exchange rate volatility (EXCR), openness of trade (OPN) and external reserves (EXRES) granger caused economic growth. However, a bidirectional causality was established between total tax on goods (NTAXGS) and economic growth (GDP), and between total tax on goods (NTAXGS) and external reserve (EXRES). Therefore, it is obvious that both exchange rate volatility and openness of trade granger caused economic growth in Nigeria within the period of study.

Summary, Conclusion and Recommendations

This paper examined the relationship between the research variables used in Nigeria from 1981 to 2021 using Autoregressive Distributed Lag (ARDL) bound and pairwise Granger causality. The findings showed a long-run relationship among the variables used. The study discovered that only external reserves (EXRES) exhibited a positive significant short-run and long-run effects on economic growth, while exchange rate volatility (EXCR) had negative significant short-run effect on Nigerian economy as aligned by Adokwe et al (2019), Morina et al (2020) and Akinwolere et al (2021). From the findings, a unidirectional causal relationship was established between exchange rate volatility and economic growth, as well as between trade openness and economic growth, where it was exchange rate volatility as well as openness of trade that granger caused economic growth. The research recommends as follows: government should encourage more export through infant industrial promotion and economic diversification to strengthen trade openness in the process of attaining economic growth in the country, and government should come up with policies to regulate exchange

rate in order for naira to regain more strength against foreign currencies and as a result, to promote trade openness.

References

- Adokwe, E. I., Agu, A. O., & Maduke, A. C. (2019). Exchange rate volatility and foreign direct investment: The Nigerian experience. *Journal of Business & Economic Policy*, 6(4), 78-88.
- Aghion, P., Bacchetta, P., Ranciere, R., & Rogoff, K. (2009). Exchange rate volatility and productivity growth: The role of financial development. *Journal of Monetary Economics*, 56(6), 494-513.
- Akinwolere, B. C. (2021). The impact of exchange rate volatility on economic growth in Nigeria: A dynamic Econometric Approach: *African Journal of Business & Economic Development*, 5(2), 15-39.
- Alagidede, P., & Ibrahim, M. (2017). On the causes and effects of exchange rate volatility on economic growth: Evidence from Ghana. *Journal of African Business*, 18(2), 169-193.
- Alam, K. J., & Sumon, K. K. (2020). Causal relationship between trade openness and economic growth: A panel data analysis of Asia countries. *International Journal of Economics & Financial Issues*, 10(1), 118-126.
- Armah, M. K., Brafo-Insaidoo, W., & Akapare, I. A. (2015). Trade liberalization and import revenue. Evidence from Ghana. *International Journal of Economics, Commerce & Management*, 7(9), 1-18.
- Achu, A. C. (2018). Relating trade openness, import and export to exchange rate in Nigeria. *International Digital Organization for Scientific Research (IDOSR) Journal of Arts & Humanities*, 3(2), 1-19.
- Barguelli, A., Ben-Salha, O., & Zmami, M. (2018). Exchange rate volatility and economic growth. *Journal of Economic Integration*, 33(2), 1302-1336.
- Benita, F. (2019). Trade openness, economic growth and the global financial crisis of 2007-2009 in Latin America. *Journal of International Development*, 31(5), 411-431.
- Central Bank of Nigeria (2019). Central Bank of Nigeria Statistical Bulletin, 45-50, Abuja, Nigeria.
- Dornbush, R. (1976). Expectations and exchange rate dynamics. *Journal of Political Economy*, 84(6), 1161-1176.
- Edward, E. L. (1995). The Heckscher-Ohlin model in theory and practice. *Princeton Studies in International Finance*, 77, ISSN 0081-8070.
- Attach-Obeng, P., Enu, P., Osei-Gyimah, T., and Opoku, C. D. (2013). An econometrics analysis of the relationship between GDP growth rate and exchange rate in Ghana. *Journal of Economics and Sustainable Development*, 4(9), 1-8.
- Gbadamosi, B. (2017). Why we intervened in forex market-CBN. Retrieved from www.punch.ng.com/
- Gray, S. (2020). IMF Monetary and capital market. Retrieved from sgray@imf.org

- Joshua, C. O., & Oladipo, J., & Umzurike, C. (2022). Impact of exchange rate volatility on economic growth: Evidence from Nigeria. *International Journal of Advances in Engineering & Management (IJAEM)*, 4(11), 1063-1080.
- Kelikume, I., & Nwani, S. E. (2019). A vector Autoregression Analysis of the efficacy of external reserves management on exchange rate stability: Evidence from Nigeria. *Journal of Economics, Management & Trade*, 24(5), 1-11.
- Kong, Q., Peng, D., Ni, Y., Jiang, X., & Wang, Z. (2020). Trade openness and economic growth quality of China: Empirical Analysis using ARDL model. *Finance Research Letters*, 38, 101488. <https://doi.org/10.1016/j.frl.2020.101488>
- Lyndon, M. E., & Ikechukwu, S. O. (2019). The relationship between exchange rate volatility, trade openness and economic growth in Nigeria: An empirical analysis. *International Journal of Development & Economic Sustainability*, 7(6), 1-14.
- Mahmoud, I., & Ali, S. Z. (2011). Impact of exchange rate volatility on macroeconomic performance of Pakistan. *International Research Journal of Finance & Economic*, issue 64, 1450-2887.
- Morina, F., Hysa, E., Ergun, U., Panait, M., & Voica, M. C. (2020). The effect of exchange rate volatility on economic growth: Case of the CEE countries. *Journal of Risk & Financial Management*, 13, 1-13.
- Nguyen, T. K. L., Thu-Trang, T. D., & Toan, N. B. (2022). Trade openness and real effective exchange rate volatility: The case of Vietnam. *Banks & Bank Systems*, 17(1), 150-160.
- Nkemdilim, I., & Azuka, E. O. (2021). The consequences of exchange rate fluctuations on Nigeria's Economic Performance: An Autoregressive Distributed Lag (ARDL) Approach. *International Journal of Management, Economics & Social Sciences*, 10(2-3), 68-87.
- Nnamdi, C. N., & Uche, E. (2019). Impact analysis of trade liberalization and the Naira exchange rate. *International Journal of Science & Research (IJSR)*, 9(8), 1460-1467.
- Nwosa, P. I., Ogbuagu, M. I., & Fasina, O. T. (2019). Trade openness and country size: An empirical assessment of Alesina and Wacziarg hypothesis in Nigeria and Benin Republic (1970-2018). *Conference Journal of Economics & Applied Sciences*, 2(2), 160-171.
- Odejimi, O. O., Isikhuemen, H. A., & Nosa, M. E. (2020). Exchange rate movement, import demand and economic growth: Evidence from Nigeria. *IOSR Journal of Economics & Finance (IOSR-JEF)*, 11(3), 18-25.
- Senadza, B., & Diaba, D. D. (2017). Effect of exchange rate volatility on trade in Sub-Saharan Africa. *Journal of African Trade*, 4(1-2), 20-36.
- Soro, G. T., & Aras, O. N. (2020). The implication of exchange rate volatility on Nigeria's external reserves; 1980-2020. *Journal of Management, Economics & Industrial Organization*, 2.5(2021), 37-47.
- Umaru, H., Aguda, N., & Nordiana, O. D. (2018). Effects of exchange rate volatility on Economic Growth of West African English-Speaking Countries. *International Journal of Academic Research in Accounting Finance & Management Sciences*, 8(4), 131-143.