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Double Shocks to Trade: Exchange Rate Volatility and Pandemic Effects on Foreign Trade Flows in Nigeria

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Abstract

This study investigated the impact of exchange rate volatility and pandemic outbreaks on foreign trade flows in Nigeria using quarterly time series data from 1981Q4 to 2025Q1. Specifically, the study investigated the impact of exchange rate volatility and pandemic outbreak on imports and exports in Nigeria. Exchange rate volatility was estimated using the Generalized Auto-regressive Conditional Heteroskedasticity (GARCH) model, while the Auto-regressive Distributed Lag (ARDL) technique was utilized. The found that exchange rate volatility has a positive and statistically significant effect on both imports and exports in the short run at a 5% level of significance, but in the long run, the impact to exchange rate volatility on foreign trade was negative but statistically insignificant at 5% level of significance; pandemic outbreaks, proxy by COVID-19 pandemic, was found to have a negative but statistically insignificant impact on imports and exports respectively in the short run at a 5% level of significance but in the long run, the impact of the pandemic became positive but statistically insignificant at a 5% level of significance. The study concluded that although exchange rate volatility may temporarily stimulate foreign trade flows in the short run, persistent exchange rate instability poses serious long-run challenges to Nigeria's import and export sector. The study therefore recommended that the Central Bank of Nigeria should implement policies aimed at stabilizing the exchange rate and minimizing excessive speculative activities in the foreign exchange market. The study also recommended export diversification beyond crude oil and the promotion of domestic production to reduce import dependence and strengthen Nigeria's resilience against future global disruptions and external shocks.

Keywords:

Exchange Rate Volatility, Pandemic, Foreign Trade Flows, Imports, Exports, ARDL, GARCH, Nigeria.

1. Introduction

Exchange rates is one of the important facilitating tools of foreign trade level and even direction. This is because its movement can influence the direction and levels of trade as it is actually a price parameter for export and import volumes and a country's trade competitiveness. In developing countries such as Nigeria whose currencies are non-convertible, trade cannot take

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place without a convertible currency or currencies, and when trade cannot take place, economic growth, export revenue, foreign direction investment, and foreign exchange earnings may be truncated. Since a nonconvertible currency requires conversion, stability or predictability of the rate of this conversion become very crucial in order to reduce uncertainty which if volatile can discourage, or encourage as the case may be, foreign trade activities over times. (Duru et al., 2022; Orebiyi et al, 2025).

Exchange rate volatility is basically when the rate of this conversion between two currencies or baskets of currencies are persistently and unpredictably uncertain and fluctuate frequently over time. These highly frequent fluctuations breed uncertainty and increase transaction risks in international trade. This transaction risk stems from the lack of the ability of foreign trade players to predict accurately the movement of the exchange rate in the future due to irregular movement patterns in the past or recent times.

This has been a major problem in Nigeria in recent time since as an economy, Nigeria faces a twin problem of being highly imported dependent and heavily oil export dependent (Lawal et al, 2024). A situation that has created a double-edged sword problem, where the country can be affected either way by the impact of exchange rate volatility on exports and also on imports respectively. The COVID-19 pandemic further worsened the situation by disrupting global supply chains, reducing international demand, causing sharp declines in crude oil prices, and restricting cross-border trade activities. These developments adversely affected Nigeria's foreign trade sector, particularly because the economy depends heavily on crude oil exports and imported industrial inputs (Udoh & Bassey, 2024). Consequently, the combined effects of exchange rate volatility and pandemic-induced shocks created additional uncertainty in Nigeria's import and export activities.

Adding to the problem of exchange rate volatility was also the outbreaks of pandemic such as Ebola and the COVID 19 which caused a locked down of economies around the world including Nigeria from 2020 to about 2022 (Effiong et al, 2023). This becomes a significant disruption element for World trade beyond the macroeconomic element of exchange rate vagary, and introduced new dimension to the relationship between exchange rate volatility and foreign trade flows. Against this backdrop, this study examined exchange rate volatility and pandemic related shocks on foreign trade inflows in Nigeria, specifically the study investigated the impact of exchange rate volatility on Nigeria's exports and imports respectively and also the impact of pandemic related shocks on Nigeria's exports and imports.

2.0 Literature review

2.1 Conceptual literature review

2.1.1 Exchange rate volatility

Exchange rate volatility refers to the degree of fluctuation or instability in the value of one currency relative to another over a given period of time. It measures the unpredictability and frequency of changes in exchange rates in the foreign exchange market. Th causal factors of exchange rate volatility include but are not limited to changes in demand and supply of foreign currencies, inflation differentials, interest rates, external shocks, speculative activities, and macroeconomic instability (Rojid & Rojid, 2024). High exchange rate volatility creates uncertainty in foreign trade and investment decisions because traders and investors may find it difficult to predict future prices and returns (Duru et al., 2022). According to Manda (2025),

exchange rate volatility influences the competitiveness of exports and imports by affecting production costs, profitability, and trade contracts in international markets.

2.1.2 Foreign trade flows

Foreign trade flows refer to the movement of goods and services across international borders through exports and imports. Exports represent domestically produced goods and services sold to other countries, while imports are goods and services purchased from foreign countries for domestic consumption or production purposes. According to Kona (2025), foreign trade flows are affected many macroeconomic variables such as exchange rates, income levels, inflation, government policies, and trade openness.

2.1.3 Pandemic

A pandemic refers to the widespread outbreak of an infectious disease that spreads across countries or continents and affects a large proportion of the population. Pandemics usually result in severe health, economic, and social consequences due to disruptions in production, transportation, trade, and global supply chains. The COVID-19 pandemic, which emerged in late 2019, significantly affected global economic activities through lockdown measures, travel restrictions, border closures, and reduced international demand (Cengiz & Manga, 2022). Tang et al. (2022) noted that pandemics create uncertainty in global markets and adversely affect production output, international logistics, and foreign trade performance.

2.2 Theoretical literature review

2.2.1 Balance of payment theory of exchange rate determination

The balance of payments theory of exchange rates is an economic theory that suggests that exchange rates are determined by the balance of international payments between countries. It was first introduced by British economist David Hume in the 18th century and later developed by economists like Jacob Viner, Harry Johnson, and Robert Mundell. The theory assumes perfect competition in international trade, flexible exchange rates, and unbiased expectations of future economic conditions. However, critics argue that it focuses solely on the balance of payments and overlooks other factors influencing exchange rates, such as inflation, interest rates, and investor mood (Krueger, 1983; 2002).

2.2.2 Risk aversion theory

Risk aversion theory is an economic theory which asserts that exchange rate volatility negatively impacts international trade flows as risk-averse exporters reduce shipments to minimize profit uncertainty under fluctuating currency values. Initially formalized by Hooper and Kohlhagen in 1978, it builds on earlier portfolio theory ideas from Ethier (1973) by incorporating firm-level risk aversion into trade decisions. The theory assumes firms cannot fully hedge currency risks via forward markets, face convex profit functions, and prioritize expected utility over mean profits. Consequently, heightened volatility raises the variance of export revenues, prompting firms to lower output or delay trade, particularly for goods without substitutes. However, it is criticized for over-relying on risk aversion assumptions, ignoring hedging innovations, forward market completeness, and cases where volatility might boost trade through option-like flexibility (De Grauwe, 1988). The theory predicts trade volumes decline proportionally with volatility measures like standard deviation of spot rates (Hooper & Kohlhagen, 1978).

2.3 Empirical literature review

The reviewed empirical studies showed many patterns, convergence, and areas of divergence regarding the relationship among exchange rate volatility, COVID-19 pandemic, exports, and imports across both developed and developing economies. A major pattern observed in the literature is the extensive use of time-series and panel econometric techniques such as the ARDL, Vector Error Correction Model (VECM), GARCH/EGARCH, gravity models, and panel estimators in analyzing the effects of exchange rate volatility on trade flows. Most studies focused on developing and emerging economies where exchange rate instability is more pronounced and trade structures are highly vulnerable to external shocks. Another common pattern is the inclusion of macroeconomic control variables such as inflation, GDP, money supply, oil prices, foreign reserves, and foreign income in explaining trade performance. Recent studies also incorporated the COVID-19 pandemic as a structural break or dummy variable to capture the disruptions in global trade flows after 2020.

In terms of convergence, many studies agree that exchange rate volatility significantly affects exports and imports. Several studies found that increased exchange rate volatility negatively affects export performance because it creates uncertainty, raises transaction costs, discourages investment in export-oriented production, and reduces international competitiveness. For instance, Duru et al. (2022), Lawal et al. (2025), Stanley (2024), Wanzala et al. (2024), Choga and Mashao (2025), and Ramesh et al. (2026) all reported that exchange rate volatility adversely affects exports either in the short run or long run. Similarly, studies such as Peştere-akçay and Akçay (2023), Inyang and Effiong (2021), and Gupta and Varshney (2023) found that exchange rate volatility negatively influences imports by increasing uncertainty and import costs. There is also broad agreement that the COVID-19 pandemic disrupted international trade flows globally. Studies by Cengiz and Manga (2022), Wang and Mo (2022), Liu et al. (2022), and Heriqbaldi et al. (2023) consistently found that the pandemic reduced exports and imports due to lockdowns, supply chain disruptions, restrictions on movement, declining global demand, and heightened uncertainty in international markets.

Another area of convergence is the evidence supporting the existence of long-run relationships among exchange rate volatility and trade flows. Many studies including Rojid and Rojid (2024), Stanley (2024), Nguse et al. (2021), Kumar and Begam (2020), Devkota (2019), and Khan et al. (2019) confirmed co-integration between exchange rate volatility and trade flows, implying that exchange rate movements have persistent long-term effects on exports and imports. Furthermore, several studies emphasized the importance of exchange rate stability policies and export diversification as necessary policy responses for improving trade performance.

Despite these similarities, the literature also revealed some divergences. While many studies found negative effects of exchange rate volatility on exports and imports, some studies reported positive or mixed effects. For example, Rojid and Rojid (2024) found that exchange rate volatility positively and significantly affected exports in Mauritius in both the short run and long run. Nguse et al. (2021) similarly reported a positive relationship between exchange rate volatility and international trade in Ethiopia. Heriqbaldi et al. (2023) found asymmetric effects where exchange rate volatility positively affected exports to some trading partners but negatively affected others. Gupta and Varshney (2023) also revealed that exchange rate volatility produced both positive and negative effects across different import commodities in

India. These divergent findings show that the effect of exchange rate volatility may depend on the structure of the economy, degree of trade openness, export composition, exchange rate regime, and the capacity of firms to hedge against currency risks.

The literature also diverges regarding the magnitude and significance of the COVID-19 pandemic's effect on trade flows. While most studies found strong negative impacts, Petrylė (2022) discovered that Lithuania's exports were relatively resilient during the pandemic, with only negligible changes in export structure. Similarly, Liu et al. (2022) found that the pandemic's effects varied across product categories, with medical goods and work-from-home related products experiencing weaker negative effects or even increased demand. These differences indicate that the pandemic affected sectors and countries unevenly depending on industrial structure, government response measures, and adaptability of supply chains.

Another divergence exists in the methodological approaches and measures of exchange rate volatility. Some studies used ARCH/GARCH family models to estimate volatility, while others relied on nominal or real effective exchange rates, gravity models, or standard deviation measures. The choice of methodology often influenced the results obtained. For instance, studies employing nonlinear or asymmetric models such as Heriqbaldi et al. (2023) found more complex relationships compared to linear ARDL models used in many earlier studies.

The empirical literature demonstrates that exchange rate volatility and the COVID-19 pandemic are important determinants of foreign trade flows. However, the direction and magnitude of their effects differ across countries, sectors, and methodologies. This lack of consensus creates an empirical gap, particularly for Nigeria where limited studies simultaneously examine exchange rate volatility, pandemic effects, exports, and imports within a unified ARDL framework.

2. 4 Summary of literature review and research gap

Despite the growing body of empirical literature on exchange rate volatility and foreign trade flows, significant gaps still exist in understanding the combined effects of exchange rate volatility and the COVID-19 pandemic on exports and imports in Nigeria. Previous studies such as Duru et al. (2022), Lawal et al. (2025), Stanley (2024), Wanzala et al. (2024), Choga and Mashao (2025), and Ramesh et al. (2026) mainly concentrated on the effect of exchange rate volatility on exports, while studies such as Peştere-akçay and Akçay (2023), Gupta and Varshney (2023), and Inyang and Effiong (2021) focused more on imports. Similarly, studies by Cengiz and Manga (2022), Wang and Mo (2022), Tang et al. (2022), and Liu et al. (2022) examined the effect of the COVID-19 pandemic on international trade across different countries and regions. However, most of these studies examined exports and imports separately and paid limited attention to the simultaneous influence of exchange rate volatility and pandemic shocks on both components of foreign trade flows within the Nigerian economy.

Furthermore, the empirical findings from previous studies remain inconclusive and divergent. While some studies such as Rojid and Rojid (2024) and Nguse et al. (2021) reported positive effects of exchange rate volatility on trade flows, others including Duru et al. (2022), Lawal et al. (2025), Stanley (2024), and Wanzala et al. (2024) found negative effects. Likewise, studies on the COVID-19 pandemic revealed mixed results regarding the magnitude and direction of its impact on imports and exports across countries and sectors.

Methodologically, most previous studies employed techniques such as VECM, VAR, gravity models, panel regressions, ARCH/GARCH, EGARCH, and ECM approaches. Although these methods are useful, many studies did not adequately capture both the short-run and long-run dynamics between exchange rate volatility, pandemic shocks, exports, and imports simultaneously within a unified framework. This study therefore filled this gap by investigating the impact of exchange rate volatility and the COVID-19 pandemic on foreign trade flows (exports and imports) in Nigeria using the ARDL approach, which is suitable for examining both short-run and long-run relationships among variables.

3.0 Research methodology

The main objective of this study was to investigate the impact of exchange rate volatility and pandemic on foreign trade flows of Nigeria. These specific aims were to examine the effect of exchange rate volatility and pandemic on total exports and total imports of Nigeria respectively using quarterly time series data from 1981Q4 to 2025Q1. To accomplish this, the study used an ex-post facto research design, which allowed for the evaluation of events that had already occurred by collecting relevant secondary data to determine the cause-and-effect relationships among the relevant variables.

3.1 Model specification

3.1.1 Exchange rate volatility-pandemic-exports model

The exchange rate volatility-pandemic-exports model expresses the relationship between the exchange rate and pandemic on total exports, it is based on the balance of payments theory and risk aversion theory which explain how fluctuations in exchange rates and economic uncertainties influence international trade flows, particularly exports.

The functional form of the model is specified as:

$$EXP = f(ERV, EXR, RGDP, FOGDP, OILP, INFL, MS, DUMCOVID19) \quad 1$$

Where:

EXP = Total exports in real terms. Measured in United States Dollars

ERV = Exchange rate volatility (GARCH(1,1) conditional variance or std. dev. of log changes in naira/USD spot rates.

INFL = Domestic price level proxy by inflation. It is measured in percentage. Inflation, a rise in prices of goods and services, can decrease the purchasing power of money and, when measured using the consumer price index, lead to currency depreciation and increased import costs.

FOGDP = Foreign real GDP proxy by United States real GDP, Measured in United States Dollars

RGDP = Domestic real GDP. Measured in United States Dollars

GOVEX = Government total expenditure. Measured in Nigerian Naira

FXR =: Foreign exchange reserves. Measured in United States Dollars

MS= broad Money supply. Measured in Nigerian Naira

OILP = Bent crude price. Average in quarters. Measured in United States Dollars

EXR = Exchange rates. Measured in naira/USD spot rates.

Equation 1 is specified in a mathematically form thus:

$$EXP = \alpha_0 + \alpha_1 ERV + \alpha_2 EXR + \alpha_3 RGDP + \alpha_4 FOGDP + \alpha_5 OILP + \alpha_6 INFL + \alpha_7 MS + \alpha_8 DUMCOVID19 \quad 2$$

Equation 2 is specified in an econometric form thus:

$$EXP = \alpha_0 + \alpha_1 ERV + \alpha_2 EXR + \alpha_3 RGDP + \alpha_4 FOGDP + \alpha_5 OILP + \alpha_6 INFL + \alpha_7 MS + \alpha_8 DUMCOVID19 + \mu_t \quad 3$$

To interpret the coefficients as elasticities, the variables in equation 3 are logged as thus:

$$log(EXP) = \alpha_0 + \alpha_1 ERV + \alpha_2 EXR + \alpha_3 log(RGDP) + \alpha_4 log(FOGDP) + \alpha_5 log(OILP) + \alpha_6 INFL + \alpha_7 log(MS) + \alpha_8 DUMCOVID19 + \mu_t \quad 4$$

μ_t, *is* the respectively disturbance terms.

α_0 i*s t*h*e* constant; and α_1 , α_2 ,α_3 , α_4 ,α_5 , α_6 , α_7 and α_8

Are the respective coefficients of exchange rate volatility-pandemic-exports model

3.1.2 Exchange rate volatility-imports-pandemic model

3.1.2 Exchange rate volatility-imports-pandemic model

The exchange rate volatility–pandemic–imports model expresses the relationship between exchange rate volatility, pandemic outbreak, and total imports in Nigeria. The model is founded on the Balance of Payments Theory and the Risk Aversion Theory, which explain how exchange rate uncertainty and economic disruptions arising from pandemics influence import demand flows.

The functional form of the model is specified as:

$$IMP = f(ERV, RGDP, FXR, OILP, MS, GOVEX, INFL, DUMCOVID19) \quad 5$$

Where:

IMP = Total imports in real terms. Measured in US dollars

GOVEX = Government total expenditure. Measured in Nigerian Naira

Equation 5 is specified in a mathematically form thus:

$$IMP = \beta_0 + \beta_1 ERV + \beta RGDP + \beta_3 FXR + \beta_4 OILP + \beta_5 MS + \beta_6 GOVEX + \beta_7 INFL + \beta_7 DUMCOVID19 \quad 6$$

Equation 6 is specified in an econometric form thus:

$$IMP = \beta_0 + \beta_1 ERV + \beta RGDP + \beta_3 FXR + \beta_4 OILP + \beta_5 MS + \beta_6 GOVEX + \beta_7 INFL + \beta_7 DUMCOVID19 + \mu_t \quad 7$$

To interpret the coefficients as elasticity, the variables in equation 7 are logged as thus:

$$log(IMP) = \beta_0 + \beta_1 ERV + \beta_2 log(RGDP) + \beta_3 log(FXR) + \beta_4 log(OILP) + \beta_5 log(MS) + \beta_6 log(GOVEX) + \beta_7 INFL + \beta_8 DUMCOVID19 + \mu_t \quad 8$$

μ_t, *is* the respectively disturbance terms.

β_0 i*s t*h*e* constant; and $\beta_1, \beta_{2,} \beta_3, \beta_4, \beta_5, \beta_{6,} \beta_7$ and β_8

Are the respective coefficients of the exchange rate volatility-imports-pandemic model.

3.3 Definition of variables and theoretical expectations

EXP = Total exports in real terms. This is the summation of all goods and services produced in an economy and sold to consumers in another economy. It is expected that the total export will have a positive effect on the exchange rate.

IMP = Total imports in real terms. This is the summation of all goods and services produced in a foreign economy and sold to consumers in a domestic economy. It is expected that the total import will have a negative effect on the exchange rate.

ERV = Exchange rate volatility (GARCH(1,1) conditional variance or std. dev. of log changes in naira/USD spot rates. Expected to have a negative effect on imports and exports respectively

INFL = Domestic price level proxy by inflation. It is measured in percentage. Inflation, a rise in prices of goods and services, can decrease the purchasing power of money and, when measured using the consumer price index, lead to currency depreciation and increased import costs. Expected to have a negative effect on imports and exports respectively

FOGDP = Foreign real GDP proxy by United States real GDP, Expected to have a positive effect on imports and exports respectively

RGDP = Domestic real GDP. Expected to have a positive effect on imports and exports respectively

GOVEX = Government total expenditure. Expected to have a positive effect on imports and exports respectively

FXR =: Foreign exchange reserves reflecting import financing capacity. Expected to have a positive effect on imports and exports respectively

MS = broad Money supply proxy domestic liquidity/import demand through monetarist channel. Expected to have a positive effect on imports and exports respectively

OILP = Bent crude price. Average in quarters. Measured in United States Dollars. Expected to have a positive effect on imports and exports respectively.

EXR = Exchange rate. It is expected to have a negative effect on exports respectively

3.4 Estimation techniques

Several estimation techniques were employed in this study to test and estimate the study's models. The Generalized Auto-regressive Conditional Heteroskedasticity (GARCH) developed by Bollerslev (1986) from the extension of ARCH model developed by Engel (1982) was used to derived the exchange rate volatility variables from the returns of the exchange rate variables. The auto regressive distributed lag model (bound test) approach was used to estimated the two models of the study.

3.3 Sources of data

The study depended largely on secondary data. An annual time series data from 1981 to 2025 was drawn from World Development Indicators of the World Bank and the Central Bank Statistical Bulletin while they were quarterly derived using a technique in Eview making the times scope from 1981:Q4 to 2025:Q1.

3.4 Limitations of the study

The study's findings may be limited computation of the quarterly data from annual data and low-frequency data, which are aggregated from daily to monthly and quarterly data. But low-frequency data are ususaly aggregated from highly frequency data, so the reverse in this case would not affect the study's results.

4. Empirical results and discussion of findings

4.1.1 Descriptive statistics of the study's variables

Table 1 presents the descriptive statistics of the study's variables from 1981:Q4–2025:Q1. for the purpose of this analysis, only variables of interest, which are exports, imports, and exchange rate volatility are analysed. Exports (EXP) recorded a mean value of $41.3 billion, with a maximum of $103 billion and a minimum of $2.9 billion while imports (IMP) recorded an average value of $46.8 billion, reaching a maximum of $114 billion and a minimum of $4.51 billion. This shows that over the time period of this study, Nigeria's imports was greater than her exports on the average, signalling import dependency which is one of the key problem of the Nigerian economy. This is sometimes blamed on the low manufacturing capacity of the Nigerian manufacturing sector and the high taste of her citizens for foreign made products

Exchange rate volatility (ERV) shows significant fluctuations, with an average value of 264.48, a minimum of 0.0001 and a very high maximum value of 42,308.87. The very high skewness (12.678) and kurtosis (161.821) tell us that the series is highly positively skewed and leptokurtic, suggesting the presence of extreme values and significant volatility clustering in exchange rate movements over the period of the study.

Table 1: Descriptive statistics of the study variables of the study's variables, 1981Q4 to 2025Q1

	Mean	Maximum	Minimum	Skewness	Kurtosis	Jarque-Bera	Probability	obs
EXP ($billion)	41.3	103	2.9	0.354	1.78	13.605	0.0001	174
IMP ($billion)	46.8	114	4.51	0.309	1.435	19.335	0.0001	174
ERV	264.48	42,308.87	0	12.678	161.821	176,757.80	0.0001	174
EXR	151.9144	1535.0000	0.6177	3.7948	21.5142	2902.7380	3.79	174
DUMCOVID	0.0460	1.0000	0.0000	4.3357	19.7982	2590.9470	0.0001	174
FOGDP ($billion)	14,900.00	22,600.00	8,020.00	0.082	1.887	8.646	0.013	174
FXR($billion)	22.2	53	0.95	0.127	1.348	19.081	0.0001	174
RGDP($billion)	306	551	116	0.294	1.439	19.011	0.0001	174
GOVEX (N billion)	4,050.00	19,800.00	10.7	1.587	4.609	86.504	0.0001	174
INFL (%)	19.36	72.84	5.39	1.79	5.125	118.483	0.0001	174
MS(Nbillion)	13,200.00	52,200.00	21.7	1.084	2.778	32.481	0.0001	174
OILP ($)	46.9	127.99	11.92	0.649	2.2	15.896	0.0001	174

Source: Author's computation (2026) using Eview

4.1.2 Correlation analysis

Table 2 presents the correlation matrix of the study's variables, just like the analysis of the descriptive statistics the study focused on interpreting the key variables of the study. ERV has a negatively but very weak correlation with exports log (EXP) at the coefficient of –0.083, and imports log (IMP) at the correlation coefficient of –0.073).

Table 2: Correlation matrix of the variables of the study, 1981Q4 to 2025Q1

	DUM COVID	ERV	EXP	EXR	FOGDP	FXR	RGDP	GOVEX	IMP	INFL	MS	OILP
DUM COVID	1											
ERV	-0.0171	1										
EXP	0.0923	-0.0750	1									
EXR	0.2075	-0.0423	0.4671	1								
FOGDP	0.3040	-0.0245	0.7704	0.7312	1							
FXR	0.2217	-0.0629	0.9187	0.5404	0.8575	1						
RGDP	0.3101	-0.0578	0.8148	0.7006	0.9577	0.8647	1					
GOVEX	0.3523	-0.0406	0.5804	0.8379	0.8604	0.6649	0.8659	1				
IMP	0.2088	-0.0696	0.9439	0.5690	0.8460	0.8920	0.9236	0.7299	1			

INFL	-0.0448	-0.0548	-0.3953	-0.1056	-0.2913	-0.3797	-0.2925	-0.1333	-0.3524	1		
MS	0.4199	-0.0500	0.6111	0.7866	0.8814	0.7036	0.9220	0.9713	0.7841	-0.1658	1	
OILP	0.0547	-0.0849	0.9299	0.4712	0.7125	0.8475	0.7733	0.6093	0.8983	-0.3637	0.6222	1

Source: Author's computation (2026) using Eview

The COVID-19 dummy variable (DUMCOVID19) exhibits weak positive correlations with exports (0.0923) and imports (0.2088). This shows that, despite the disruptions caused by the pandemic, Nigeria's foreign trade activities maintained some degree of resilience during the COVID-19 period. The stronger positive relationship with imports compared to exports may indicate that import demand for essential goods, medical supplies, and industrial inputs remained relatively high during the pandemic period. However, the relatively low magnitude of the correlations revealed that the pandemic did not drastically alter the overall trade structure in the long run.

4.1.3 Granger causality test result analysis

Table 3 presents the results of the pairwise Granger causality tests conducted to examine the direction of causality between exchange rate volatility (ERV), pandemic variable (DUMCOVID19) and export and import variables over the period 1981Q4 to 2025Q1 using two lag periods. The result shown that exchange rate volatility Granger-causes both exports and import respectively as indicated by the F-statistic of 6.7430 and 7.3667 and a probability value of 0.0102 and 0.0073 respectively, which are less than the 5% significance level while exports and imports do not Granger cause exchange rate volatility at a 5% level of significance. This implies that past values of exchange rate volatility significantly influence exports and imports in the Nigerian economy. However, exchange rate volatility and pandemic do not Granger-cause export and import respectively and vice-versa, given the probability values exceeds the 5 percent significance threshold.

Table 3: Pairwise Granger causality results of the study's key variables, 1981Q4 2025Q1

Pairwise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(EXP01) does not Granger Cause DUMCOVID19	173	0.1022	0.7497
DUMCOVID19 does not Granger Cause LOG(EXP01)		2.7758	0.0975
LOG(IMP) does not Granger Cause DUMCOVID19	173	0.6023	0.4388
DUMCOVID19 does not Granger Cause LOG(IMP)		0.1416	0.7071
LOG(EXP) does not Granger Cause ERV	173	2.2172	0.1383
ERV does not Granger Cause LOG(EXP)		6.7430	0.0102
LOG(IMP) does not Granger Cause ERV	173	1.5465	0.2154
ERV does not Granger Cause LOG(IMP)		7.3867	0.0073

Source: Author's computation (2026) using Eview

4.1.4 Unit root test results

Table 4 presents the results of the unit root tests conducted using the Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) tests to determine the stationarity properties of the variables employed in the study for the period 1981Q4 2025Q1. The results revealed that exchange rate volatility (ERV) is stationary at level, as indicated by the ADF statistic of –13.1130 with a probability value of 0.0001 and the PP statistic of –13.1130 with a probability value of 0.0001. Since the probability values are less than the 5 percent significance level, the null hypothesis of unit root is rejected. Consequently, ERV is integrated of order zero, I(0), implying that the variable does not require differencing before estimation.

Inflation (INFL), log of export, log of FOGDP, log of FXR, log of GDP, log of GOVEX, log of IMP, log of MS, and log of OILP , however, was found to be non-stationary at level under both the ADF and PP tests, with probability values greater than 0.05. After first differencing, the variable became stationary, as shown by the ADF statistic of –4.0120 with a probability value of 0.0101 and the PP statistic of –5.2481 with a probability value of 0.0001. This indicates that inflation is integrated of order one, I(1). The combination of I(0) and I(1) variables justifies the adoption of the Autoregressive Distributed Lag (ARDL) modelling approach for the study, since the ARDL technique is appropriate when variables are integrated at different orders, provided none is integrated of order two, I(2).

TABLE 4 Unit root test results: ADF and PP summarized result of the unit root test results;1981Q4 2025Q1

Variable	ADF		PP		Remark
	At level	After first difference	At level	After first difference	
ERV	-13.1130	NE	-13.1130	NE	I(0)
	(0.0001)		(0.0001)		
INFL	-3.2501	-40120	-2.9265	-5.2481	I(1)
	(0.0785)	(0.0101)	(0.1568)	(0.0001)	
Log (EXP)	-2.3805	-6.5385	-26710	-6.1155	I(1)
	(0.3884)	(0.0001)	(0.5578)	(0.0001)	
Log (FOGDP)	-2.3251	-4.2100	-1.7475	-5.8893	I(1)
	(0.4177)	(0.0054)	(0.7527)	(0.0001)	
Log (FXR)	-3.3754	-7.1391	-2.5718	-7.0041	I(1)
	(0.0581)	(0.0001)	(0.2938)	(0.0001)	
Log (DGDP)	-0.8655	-4.2558	-2.2629	-3.5250	I(1)
	(0.9564)	(0.0046)	(0.4515)	(0.0399)	
Log (GOVEX)	-0.9065	-5.3045	-0.3607	-4.6923	I(1)

	(0.9519)	(0.0001)	(0.9883)	(0.0010)	
Log (IMP)	-2.7904	-4.3526	-2.5170	-5.3450	I(1)
	(0.2029)	(0.0034)	(0.3196)	(0.0001)	
Log (MS)	-0.2420	-3.9391	-0.5377	-3.9589	I(1)
	(0.9916)	(0.0001)	(0.9994)	(0.0118)	
Log (OILP)	-2.9651	-12.4521	-2.9992	-12.8424	I(1)
	(0.1452)	(0.0001)	(0.1355)	(0.0010)	

Figures in brackets are corresponding probability values of ADF and PP statistics.

NE stands for "not estimated", this is for variables whose series was stationary at level and there was no need to go further.

Source: Author's computation (2026) using Eview

4.1.5 Analysis of the ARCH/GARCH estimation results

Table 5 presents the results of the ARCH/GARCH model estimated using the Maximum Likelihood (ML) method with Student's t-distribution. The estimation was conducted to examine the behaviour and persistence of exchange rate volatility (ERV) over the study period. The model incorporates both the mean equation and the variance equation in order to capture the dynamic characteristics of exchange rate fluctuations and volatility clustering. In the mean equation, the constant term has a coefficient value of 0.009086 with a probability value of 0.0000, indicating that it is statistically significant at the 1 percent significance level. This shows the presence of a positive mean change in exchange rate returns during the study period.

Table 5: The ARCH/GARCH estimation results

Dependent Variable: EXRTS				
Method: ML ARCH - Student's t distribution (Marquardt / EViews legacy)				
LOG(GARCH) = C(4) + C(5)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(6)*LOG(GARCH(-1))				
Variable	Coefficient	Std. Error	z-Statistic	Prob.
Constant	0.009086	0.002084	4.360119	0.0001
AR(2)	0.360927	0.043511	8.295114	0.0001
MA(2)	0.471392	0.02756	17.10414	0.0001
Variance Equation				
Constant	-1.775776	0.728058	-2.439057	0.0147
ARCH	1.162157	1.325684	0.876647	0.3807
GARCH	0.693591	0.078198	8.869692	0.0001

Source: Author's computation (2026) using Eview

The autoregressive term AR(2) has a coefficient of 0.360927 and a probability value of 0.00001, implying that the second lag of exchange rate returns significantly influences the current exchange rate returns. The positive coefficient indicates persistence in exchange rate movements, meaning that past exchange rate behaviour contributes positively to present exchange rate dynamics. Similarly, the moving average term MA(2) is positive and statistically significant, with a coefficient value of 0.471392 and a probability value of 0.0000. This result implies that previous shocks or disturbances in exchange rate returns significantly affect current exchange rate movements. The significance of both the AR and MA terms confirms that the ARMA structure appropriately captures the time series dynamics of exchange rate returns.

The variance equation provides information on the volatility behaviour of the exchange rate series. The constant term in the variance equation, has a coefficient of –1.775776 with a probability value of 0.0147, indicating statistical significance at the 5 percent level. This suggests the presence of a baseline level of volatility in the exchange rate series. The ARCH effect parameter has a coefficient value of 1.162157 but is statistically insignificant with a probability value of 0.3807. This indicates that short-run shocks or recent innovations in exchange rate volatility do not significantly affect current volatility. In other words, immediate past disturbances have limited explanatory power for present volatility behaviour.

However, the GARCH parameter is positive and highly significant, with a coefficient value of 0.693591 and a probability value of 0.0000. This finding indicates strong volatility persistence in the exchange rate series, implying that past volatility significantly influences current volatility levels. The relatively high coefficient value further suggests that volatility shocks tend to persist over time before gradually dissipating. The significance of the GARCH term confirms the presence of volatility clustering in the exchange rate series, where periods of high volatility are followed by periods of high volatility, and periods of low volatility are followed by low volatility.

4.1.6 Analysis of post-GARCH diagnostic test results: ARCH test

Table 6: Post-GARCH Diagnostic Test Results: ARCH Test

Heteroskedasticity Test: ARCH			
F-statistic	0.035968	Prob. F(1,171)	0.8498
Obs*R-squared	0.036381	Prob. Chi-Square(1)	0.8487

Source: Author's computation (2026) using Eview

Table 6 presents the results of the post-estimation diagnostic test for heteroskedasticity using the ARCH (Autoregressive Conditional Heteroskedasticity) test. The purpose of this test is to determine whether there is any remaining ARCH effect in the residuals after estimating the GARCH model. In other words, it checks whether the model has successfully captured volatility clustering in the series. The null hypothesis of the ARCH test states that there is no ARCH effect in the residuals, while the alternative hypothesis suggests the presence of ARCH effects.

The result shows that the F-statistic is 0.035968 with a corresponding probability value of 0.8498. Similarly, the Obs*R-squared statistic is 0.036381 with a Chi-square probability value of 0.8487. Both probability values are significantly greater than the 5 percent significance level. Since the probability values exceed 0.05, the null hypothesis cannot be rejected. This indicates that there is no statistically significant ARCH effect remaining in the residuals of the estimated model. The implication of this result is that the GARCH model is adequately specified and has successfully captured the time-varying volatility in the data. The absence of remaining ARCH effects suggests that the model residuals are homoskedastic, meaning that the variance of the error term is constant over time after estimation.

4.1.7 Analsysis of Autocorrelation (Ljung–Box Q) diagnostic test results

Table 7: Autocorrelation (Ljung–Box Q) diagnostic test results

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
.|. |	.|. |	1	-0.014	-0.014	0.0372	0.847
.|. |	.|. |	2	-0.015	-0.015	0.0768	0.962
.|. |	.|. |	3	-0.014	-0.015	0.1135	0.990
.|. |	.|. |	4	-0.012	-0.013	0.1396	0.998
.|. |	.|. |	5	-0.015	-0.015	0.1780	0.999
.|. |	.|. |	6	-0.015	-0.016	0.2207	1.000
.|. |	.|. |	7	-0.015	-0.017	0.2629	1.000
.|. |	.|. |	8	-0.010	-0.011	0.2798	1.000
.|. |	.|. |	9	-0.010	-0.012	0.2991	1.000
.|. |	.|. |	10	-0.010	-0.012	0.3196	1.000

Source: Author's computation (2026) using Eview

Table 7 presents the autocorrelation diagnostic results of the estimated model using the correlogram and Ljung–Box Q-statistic over 10 lags, based on 174 observations covering the period 1981Q1 to 2025Q4. The purpose of this test is to determine whether the residuals from the estimated model are serially correlated. The null hypothesis of the Ljung–Box Q test states that there is no autocorrelation in the residuals up to the specified lag length. The results show that the autocorrelation (AC) and partial autocorrelation (PAC) coefficients across all reported lags (1 to 10) are very close to zero and consistently negative but extremely small in magnitude. This indicates that there is no meaningful pattern of serial dependence in the residuals of the model.

Since all p-values are greater than 0.05, the null hypothesis of no serial correlation cannot be rejected at any lag length. This indicates that the residuals of the model are not serially correlated, confirming that the model is adequately specified in terms of capturing the dynamic structure of the data. The implication of this result is that the estimated model has successfully eliminated systematic patterns in the residuals, and there is no evidence of autocorrelation that

could bias the standard errors or compromise inference. This enhances the reliability and efficiency of the estimated coefficients.

4.1.8 Analysis of the conditional variance graph of exchange rate volatility

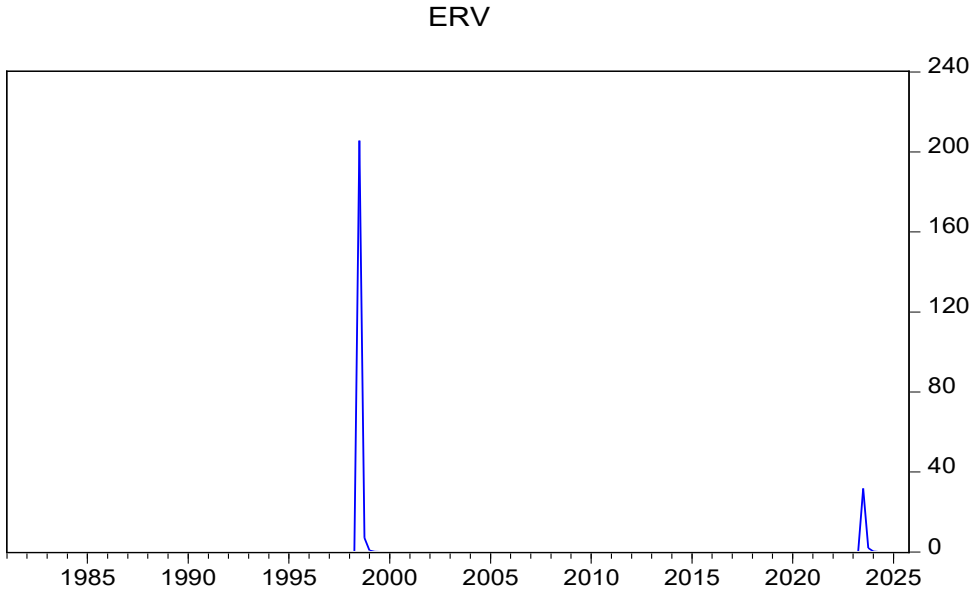

FIG 3: The conditional variance graph of exchange rate volatility

The conditional variance graph in FIG 3 presents the evolution of volatility over time within the estimated model, capturing periods of instability and relative calm in the series. From the graph, volatility is highly uneven and characterized by distinct spikes. There is a major sharp spike observed around the mid-period of the series, indicating a sudden surge in volatility. This suggests the occurrence of a significant economic shock or structural disturbance during that period, which temporarily increased uncertainty in the model. The graph confirms the presence of volatility clustering, where periods of high volatility are followed by further high volatility, and periods of stability follow low volatility phases. This behaviour supports the suitability of the ARCH/GARCH framework used in the analysis, as it effectively captures time-varying variance and persistence in shocks.

4.2 Presentation of results

4.2.1 Optimal lag selection

Table 8 presents the results of the Vector Autoregression (VAR) lag order selection criteria used to determine the optimal lag length for the study's models. The selection of an appropriate lag length is essential in time series analysis because it helps to capture the dynamic relationships among variables while avoiding problems associated with over-parameterization or model misspecification. The criteria employed was the Akaike Information Criterion (AIC). The results show that the model was estimated with lag lengths ranging from six for import equation and two lags for export equation.

Table 8: Optimal lag selection of the study's equation

Model	Optimal lag selected	criterion
Export's equation	2	AIC
Import's equation	6	AIC

Source: Author's computation (2026) using Eview

4.2.2 Bounds (Co-integration) test results of the models of the study

Table 9: Bounds test results for long run relationships among the export and import equation's variables

ARDL Bounds Test for export's model			ARDL Bounds Test for import's model		
Null Hypothesis: No long-run relationships exist			Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	k	Test Statistic	Value	k
F-statistic	6.486772	8	F-statistic	8.838	8
Critical Value Bounds			Critical Value Bounds		
Significance	I0 Bound	I1 Bound	Significance	I0 Bound	I1 Bound
10%	1.95	3.06	10%	1.66	2.79
5%	2.22	3.39	5%	1.91	3.11
2.50%	2.48	3.7	2.50%	2.15	3.4
1%	2.79	4.1	1%	2.45	3.79

Source: Author's computation (2026) using Eview

The results in Table 9 show that the export model, the estimated F-statistic is 6.486772 for export's model and 80.838 for import's model, which exceeds both the lower bound (I(0)) and upper bound (I (1)) critical values at all conventional significance levels. Specifically, the estimated F-statistic is greater than the upper bound critical value of 4.10 and 3.793 respectively at the 1 percent significance level. Consequently, the null hypothesis of no long-run relationship is rejected. The findings therefore justify the estimation of long-run coefficients and the associated Error Correction Models (ECM) within the ARDL estimation technique.

4.2.3 Analysis of the Short run ARDL and Error correction results of equation

Table 10: Short run ARDL and Error correction results of the models of the study

Dependent Variable: LOG(IMP)			Dependent Variable: LOG(EXP)		
Selected Model: ARDL(1, 0, 1, 0, 1, 0, 1, 0, 1)			Selected Model: ARDL(1, 1, 0, 1, 1, 1, 1, 1, 0)		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
D(ERV)	0.000004	0.0142	D(ERV)	0.000008	0.0001
DLOG(FXR)	0.122351	0.0002	D(EXR)	0.000125	0.0122
DLOG(MS)	-0.072331	0.0003	DLOG(FOGDP)	8.209468	0.0000
DLOG(GDP)	-0.064843	0.0002	DLOG(FXR)	0.793337	0.0007
DLOG(GOVEX)	0.644241	0.0000	DLOG(GDP)	1.96091	0.0144
D(INFL)	-0.001902	0.0000	D(INFL)	-0.009139	0.0000
DLOG(OILP)	0.015536	0.6398	DLOG(OILP)	0.019259	0.6609
D(DUMCOVID)	-0.07287	0.1368	D(DUMCOVID)	-0.032527	0.3344
CointEq(-1)	-0.049844	0.0121	CointEq(-1)	0.039788	0.0924
Diagnostic test results			Diagnostic test results		
Adjusted R-squared	0.996298	2.027372	Adjusted R-squared	0.9934	1.9524
Breusch-Godfrey Serial Correlation LM Test:	Obs*R-squared	6.75693	Breusch-Godfrey Serial Correlation LM Test:	Obs*R-squared	5.2165
	Prob. Chi-Square(2)	0.1291		Prob. Chi-Square(2)	0.248
Heteroskedasticity Test: Breusch-Pagan-Godfrey	Obs*R-squared	27.7654	Heteroskedasticity Test: Breusch-Pagan-Godfrey	Obs*R-squared	14.6427
	Prob. Chi-Square(2)	0.1469		Prob. Chi-Square(2)	0.2054

Source: Author's computation (2026) using Eview

The results in Table 10 shown that exchange rate volatility exerts a positive and statistically significant effect on both imports and exports. In the import model, the coefficient of exchange rate volatility is 0.000004 with a probability value of 0.0142, while the export model has a coefficient of 0.000008 with a probability value of 0.0001. This implies that increases in exchange rate volatility stimulate both import and export activities in the short run in Nigeria. Economically, the result revealed that traders respond to exchange rate fluctuations by adjusting their trade decisions rapidly. However, the impact of exchange rate volatility is stronger on exports than imports, as indicated by the larger coefficient and stronger statistical significance in the export model. This implies that exporters appear more responsive to exchange rate movements, possibly because currency depreciation improves the international competitiveness of Nigerian exports.

The positive relationship between exchange rate volatility and imports indicates that Nigeria's import sector remains highly dependent on foreign goods despite exchange rate instability. Importers may increase import demand in anticipation of further depreciation of the domestic currency or due to the necessity of importing essential goods and industrial inputs that are not sufficiently produced locally. In contrast, the stronger positive effect on exports suggests that exchange rate fluctuations may create opportunities for exporters to expand export volumes, particularly in sectors where Nigerian goods become relatively cheaper in foreign markets.

The coefficient of the COVID-19 dummy variable, which represent pandemic shows a negative effect on both imports and exports respectively in the short run in Nigeria. In the import model, the coefficient is −0.0729 with a probability value of 0.1368, while the export model records a coefficient of −0.0325 with a probability value of 0.3344. despite the statistically insignificance of the dummy variables of both export and import model, this indicate that the COVID-19 pandemic negatively impacted both export and import activities in Nigeria. Economically, the pandemic disrupted global supply chains, reduced international demand, restricted movement across borders, and weakened global economic activities, thereby negatively affecting both imports and exports. The larger negative coefficient in the import model suggests that imports were more severely affected than exports during the pandemic period, possibly because Nigeria relies heavily on imported machinery, raw materials, and consumer goods.

Comparatively, the results indicate that exchange rate volatility had a more significant positive impact on exports than imports, whereas the COVID-19 pandemic has a relatively stronger negative effect on imports than exports. This implies that Nigeria's export sector has a greater resilience to pandemic-related shocks, likely due to the continued demand for crude oil exports despite global economic disruptions. However, the insignificant impact of the COVID-19 variable in both models implies that the negative impact of the pandemic was just temporary with little disruption to Nigerian foreign trade activities in the short run.

The error correction terms (ECTs) in both models are negative and statistically significant, confirming the existence of stable long-run relationships among the variables. The coefficient of the error correction term is −0.0498 in the import model and −0.0633 in the export model. This implies that approximately 4.98 percent of disequilibrium in imports and 6.33 percent of disequilibrium in exports are corrected each quarter. The higher adjustment speed in

the export model indicates that exports return to long-run equilibrium faster than imports following short-run shocks.

The diagnostic statistics further confirm the reliability of the estimated models. The adjusted R-square values of 0.9962 for imports and 0.9934 for exports shows that the independent variables account for about 99.62 and 99.34 percent respectively of the variations in both import and export flows. In addition, the Durbin–Watson statistics of approximately 2 suggest the absence of serious autocorrelation problems. The Breusch–Godfrey Serial Correlation LM test and the Breusch–Pagan–Godfrey heteroskedasticity test also shows that the models are free from serial correlation and heteroskedasticity problems, as the probability values exceed the 5 percent significance level. These results indicate that the models are statistically stable, econometrically sound, and suitable for policy analysis and interpretation.

4.2.4 Analysis of the Long run ARDL results of the estimated equations.

The long-run results as displayed by Table 11 shows that exchange rate volatility (ERV) has a negative and statistically insignificant impact on both imports and exports in the long run in Nigeria at a 5% level of significance. In the import model, the coefficient of exchange rate volatility is −0.000081 with a probability value of 0.0834, while the export model has a coefficient of −0.000314 with a probability value of 0.1213. The negative relationship entails that exchange rate instability discourages foreign trade activities over time. Economically, persistent fluctuations in exchange rates increase uncertainty, transaction costs, and planning difficulties for traders, thereby leading to decline in export and import activities.

Table 11: Long run ARDL results of the models of the study

Dependent Variable: LOG(IMP)			Dependent Variable: LOG(EXP)		
Variable	Coefficient	Prob.	Variable	Coefficient	Prob.
ERV	-0.000081	0.0834	ERV	-0.000314	0.1213
LOG(FXR)	-0.4014	0.1126	EXR	-0.003135	0.1629
LOG(GDP)	1.3009	0	LOG(FOGDP)	1.400221	0.774
LOG(GOVEX)	-1.6447	0.0087	LOG(MS)	0.166017	0.7911
LOG(MS)	1.4512	0.009	LOG(GDP)	-2.543866	0.3913
LOG(OILP)	0.8517	0.0208	INFL	0.031027	0.187
INFL	0.0382	0.0257	LOG(OILP)	2.618365	0.0323
DUMCOVID	0.1417	0.7941	DUMCOVID	0.81752	0.4135

Source: Author's computation (2026) using Eview

The larger negative coefficient in the export model suggests that exports are more adversely affected by exchange rate volatility than imports in the long run. This may be because exporters are more sensitive to exchange rate uncertainty due to long-term contractual obligations and international pricing considerations.

The coefficient of the COVID-19 dummy variable ((DUMCOVID), which represent pandemic, has a positive but statistically insignificant effect on both imports and exports in the long run at a 5 % level of significance. In the import model, the coefficient is 0.1417 with a probability value of 0.7941, while the export model has a coefficient of 0.8175 with a probability value of 0.4135. Although insignificant, the positive coefficients suggest that Nigeria's foreign trade activities showed some resilience during the pandemic period. Economically, this outcome may reflect the gradual recovery of global trade, policy interventions, and the continued demand for Nigeria's crude oil exports despite the disruptions caused by COVID-19. The larger positive coefficient in the export model indicates that exports responded more favorably to post-pandemic recovery conditions than imports.

Comparatively, the results show that exchange rate volatility had a stronger adverse effect on exports than imports in the long run in Nigeria, whereas the COVID-19 pandemic exerted a relatively larger positive influence on exports than imports, although both effects remain statistically insignificant. This implies that long-run exchange rate instability constitutes a greater challenge to export performance, while the effects of the pandemic on Nigeria's trade sector were largely temporary and moderated over time.

Among the control variables in the import model, gross domestic product, money supply, oil price, and inflation exert positive and statistically significant effects on imports. Specifically, GDP increases imports by approximately 1.30 percent, indicating that economic growth stimulates demand for foreign goods. Money supply also positively influences imports, implying that increased liquidity raises purchasing power and import demand. Similarly, higher oil prices increase imports due to improved foreign exchange earnings from oil exports, while inflation positively affects imports, suggesting that rising domestic prices encourage consumers to substitute imported goods for locally produced alternatives. In contrast, government expenditure has a negative and statistically significant effect on imports, indicating that increased government spending may promote domestic production and reduce dependence on foreign goods. Foreign reserves exert a negative but statistically insignificant effect on imports.

In the export model, oil price is the only variable with a positive and statistically significant effect on exports, with a coefficient of 2.6184 and a probability value of 0.0323. This implies that a 1 percent increase in oil prices increases exports by approximately 2.62 percent. Economically, this reflects the dominant role of crude oil in Nigeria's export structure, where increases in international oil prices substantially improve export earnings. Other variables such as foreign GDP, domestic GDP, inflation, money supply, and the exchange rate carry statistically insignificant coefficients, suggesting weak long-run influence on export performance during the study period.

4.2.5 Stability test results of estimated equation

The stability test using the cumulative sum (CUSUM) and the square of cumulative sum (square of CUSUM) Figure 3 revealed that the variables in the estimated equations remained consistent throughout the study period, indicating no structural break in the parameters, allowing for policy formulation.

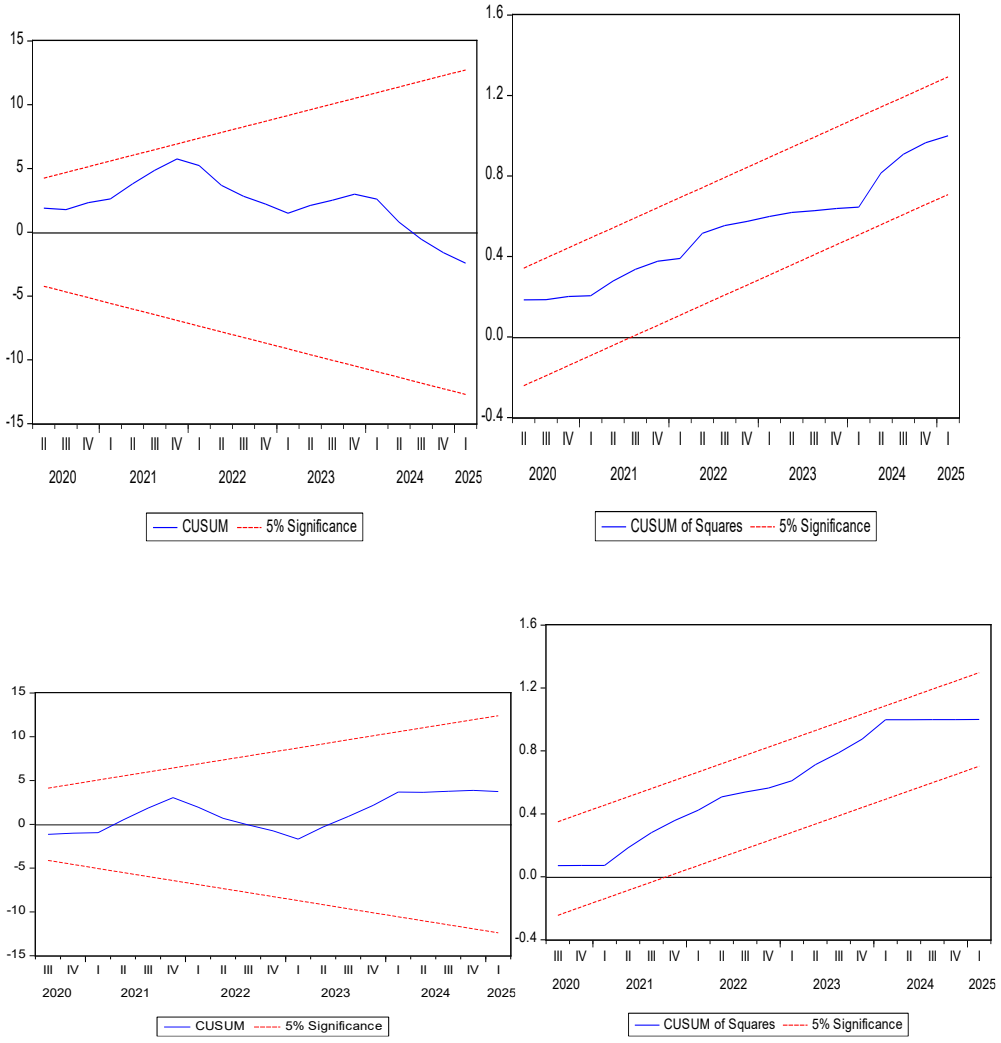

FIG 4: Cumulative sum for test of stability of the parameters of the estimated equations

4.3 Discussion of findings

The study found that exchange rate volatility has a positive and statistically significant effect on both imports and exports in the short run at 5% level of significance. This means that fluctation in exchange rate boosts both export and import activities in the short run. This indicates the aggressive responses of importers and exporters to foreign trade activities due to exchange rate volatility because of panic or speculative motive. This also revealed how vulnerable the Nigeria economy is to external shocks due to the structure of her economy which is largely oil export dependent and import reliance. This postitive impact of exchange rate volatility which is against the study's apriori expectation but is in line with Rojib and Rojib (2024) and Nguse et al, (2021) whose studies found positive effect of exchange rate volatility on foreign trade; and not in line with Duru et al, (2022) and Lawal et al, (2025).

But in the long run, exchange rate volatility has a negative but statistically insignificant impact on both imports and exports at a 5% level of significance. This is in line with Duru et al, (2022) and Lawal et al, (2025). This shows that in the long run, the positive effect of exchange rate volatility on foreign trade only temporary and it is a matter of time that the

negative and disruptive effect of exchange rate valatility on foreign will be felts by the Nigerian economy. The benefits of exchange rate volatility are only shortlived benenfits and may only being benefitng exporter and importers who took advantage to speculate througn panic buying and hoarding. This negative effect in the long run is more on export than on imports while the positive effect ia also more on exports than imports. .

The study found pandemic has a negative but statistically insignificant impact on both imports and exports in the short run at a 5% level of significance. This result implied that pandemic has a disruptive effect on foreign trade activities in forms of restrictions across countries' borders, disruption in global supply chain necessary to produce some products, the introduction of lockdown to contain pandemic spread also lead to loss of income which greatly reduce global demand. The impact of pandemic on foreign trade is in line with Liu et al., (2022) and Wang and Mo (2022). The negative impact of pandemic was found ot be stronger on imports than exports. This revealed that the import sector in Nigeria suffered more during pandemic due to import dependence on key industiral inputs sucha as imported machinery and consumer goods. Export was more milder because the churn of Nigerian exports is crude oil which is essential for industrialised countries who constantly sought it despite pandemic outbreak. The statitistical insignificance of this impact goes to show that they are temporary and not a major factor in foreign trade decline in the short run period in Nigeria.

The study found that pandemic, The COVID-19 pandemic, has a positive and statitically insignificant effect on both exports and imports in the long run at a 5% level of significance. This show that exports and imports adjusted and recovered over time. This positive effect is more on exports than imports showing that global demand for Nigerian crude oil rebound and the Nigerian export sector even benefit more for post pandemic recovery.

The error correction terms in both models are negative and statistically significant, as it is theoretical expected for the existence of stable long-run relationships among the variables. The export model exhibits a faster adjustment speed than the import model, implying that exports return to equilibrium more quickly following short-run shocks.

The study also found that in term of predicting the future behaviour of the study's variables from the past values of the variables, exchange rate volatility and foreign trade have causal relationship with unidirectional causality running from exchange rate volatility to exports and imports respectively at a 5% level of signficance while it found the non-existence of Granger causality between pandemic and foreign trade, be it exports or imports at a 5% level of significance. This finding is understandably since pandemic has more naturally occurring and mostly beyond human control.

5.0 Summary and conclusion of the study and policy recommendations

5.1 Summary and conclusion of the study

This study investigated the effects of exchange rate volatility and pandemic outbreaks on foreign trade flows in Nigeria over the period 1981Q4 to 2025Q1 using the ARDL and GARCH estimation technique. The study found that exchange rate volatility has a positive and statistically significant effect on both imports and exports in the short run in Nigeria at a 5% level of significance, but in the long run, the impact on both imports and exports was negative

but statistically insignificant at a 5% level of significance. The study also found that pandemic has a negative but statistically insignificant impact on foreign trade in the short run at 5% level of significance in Nigeria, but in the long run, pandemic was found to be positive but statistically insignificant at a 5% level of significance.

The study concluded that exchange rate volatility and pandemic have both short-run and long-run effects on Nigeria's foreign trade flows by stimulating imports and exports in the short run, suggesting that traders respond quickly to currency fluctuations through speculative activities, panic buying, and adjustments in trade decisions. However, in the long run, exchange rate volatility has a negative impact on both imports and exports, indicating that persistent exchange rate instability creates uncertainty and discourages sustainable foreign trade flows in Nigeria. The negative long-run impact was found to be stronger on exports, reflecting the vulnerability of Nigeria's export sector to exchange rate uncertainty. The study also showed that the COVID-19 pandemic negatively affected imports and exports in the short run due to disruptions in global supply chains, lockdown measures, and reduced international demand. The impact was more severe on imports because of Nigeria's heavy dependence on imported industrial inputs and consumer goods. Nevertheless, the long-run results suggest that the effects of the pandemic were temporary, as both imports and exports gradually recovered over time, with exports showing stronger recovery due largely to renewed global demand for crude oil.

5.2 Policy recommendations

Based on the finding of the study, the following policy recommendations are offered:

1. Based on the positive ans statistically significant influence of exchange rate volatility on foreign trade flows in the short run which is temporary and unattainable, and negative effect on the long run, which is permanent, the Central Bank of Nigeria should implement policies aims at reducing the excessive fluctuations of the Nigeria's exchange rate by focusing on effective exchange rate management, focusing foreign reserve accumulation, and the monetary authorities should also check and minimise excessive speculative activities in the Nigeria's foreign exchange market through proper monitoring and check mechanisms.
2. Since the the long-run negative impact of exchange rate volatility is stronger on exports than imports, the fiscal authorities should promote export diversification beyond crude oil exports by supporting agriculture, manufacturing, and solid minerals. This can be achieved through export incentives, tax reliefs, improved infrastructure, and increased access to credit for export-oriented industries. Diversification will reduce the vulnerability of Nigerian exports to exchange rate instability and external shocks.
3. Based on the negative impact of pandemic on foreign trade, the government should encourage domestic production through industrialization policies, support for local industries, and leverage on increased oil revenue to develop the non-oil productive sectors of the Nigerian economy. This will Increase production capacity will reduce dependence on imports and strengthen resilience against future global disruptions.

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