INTERACTIVE EFFECTS OF EXCHANGE RATE VOLATILITY AND POLITICAL INSTABILITY ON NIGERIA–UNITED STATES BILATERAL TRADE

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Abstract: This study investigates the interactional effect of exchange rate volatility and political instability on Nigeria–United States bilateral trade using quarterly time-series data from 1990Q1 to 2024Q4, sourced from the World Bank and World Governance Indicators. Employing Autoregressive Distributed Lag (ARDL) model with interaction terms alongside the Exponential GARCH (EGARCH) framework, the analysis captures both long-run relationships and asymmetric volatility dynamics. The Bound test confirms strong long run cointegration among the variables (F-statistic = 7.416 > upper bound at 1%). ARDL estimates show that exchange rate volatility exerts a positive and significant effect on trade (14.46; $p < 0.01$), while political instability independently increases trade (64.34; $p < 0.01$), reflecting temporary crisis-induced trade adjustments, their combined interaction revealed a highly significant negative effect (–13.51; $p < 0.01$), demonstrating that political instability amplifies the adverse impact of currency fluctuations on bilateral trade. Results from the EGARCH results reveal significant volatility clustering and asymmetric responses to shocks in Nigeria–US bilateral trade, the presence of a significant leverage effect confirms that the impact of shocks on trade volatility is asymmetric. The error correction term (–0.039; $p < 0.01$) confirms a slow but stable long-run adjustment path, while diagnostic tests validate the model's robustness, showing no serial correlation, heteroskedasticity, and multicollinearity, the study concludes that exchange rate volatility may stimulate trade under stable political conditions, its interaction with political instability substantially constrain Nigeria–U.S. trade flows. The study recommends strengthening political institutions, enhancing exchange rate management, and improving risk-mitigation mechanisms to promote sustainable bilateral trade.

Keywords: *exchange rate volatility, political instability, interaction effects, Bilateral trade, EGARCH, ARDL*
JEL Classification: *C32, F14, F31, O55, P48*

1.0 Introduction

International trade is increasingly influenced by macroeconomic volatility and institutional uncertainty, particularly in developing and commodity-dependent economies. Early studies by McKinnon (1963) and Kindleberger (1973) emphasize that unstable exchange rate regimes and weak financial systems increase transaction costs and external vulnerability. Similarly, Clark (1973) and Ethier (1973) argue that exchange rate volatility generates uncertainty that discourages long-term trade contracts and reduces trade flows. Empirical evidence provided by Öztürk (2006) and Bahmani-Oskooee and

Hegerty (2007) suggests that the impact of exchange rate volatility on trade depends on country-specific characteristics, including economic structure and monetary policy. Beyond macroeconomic factors, institutional conditions are equally important. Political instability often results in frequent policy changes and unpredictable government decisions, thereby creating an uncertain business environment that discourages risk-averse investors and traders. Consequently, investors tend to prefer countries characterized by political stability and sound economic conditions, even when such environments offer relatively lower returns (Barro, 1991; Alesina & Perotti, 1996). Consistent with this view, Awokuse (2006) finds that political instability significantly reduces trade flows by weakening investor confidence and increasing transaction costs.

Nigeria presents a suitable case for examining these relationships because of its heavy dependence on crude oil exports and its exposure to both macroeconomic and political shocks. Crude oil accounts for about 90 percent of the country's export earnings, while Nigeria–United States bilateral trade amounted to approximately US$13 billion in 2024. During the same period, the naira experienced substantial depreciation and Nigeria continued to record weak political stability indicators, reflecting persistent governance and institutional challenges. Previous studies by Alege and Osabuohien (2015) and Udoh and Egwaikhide (2018) show that exchange rate instability and political uncertainty constitute major constraints to Nigeria's trade and investment performance.

Although extensive literature exists on the separate effects of exchange rate volatility and political instability on trade, limited attention has been devoted to their combined influence. In practice, these factors often occur simultaneously, with political instability potentially amplifying the adverse effects of exchange rate fluctuations through heightened uncertainty, weakened investor confidence, and disruptions to production and trade activities. Conversely, stable political institutions may lessen the negative consequences of exchange rate movements by providing a predictable policy environment.

Against this backdrop, this study investigates the interaction effect of exchange rate volatility and political instability on Nigeria–United States bilateral trade over the period 1990Q1–2024Q4. Using the Autoregressive Distributed Lag (ARDL) framework with interaction terms and the Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model, the study examines both the long-run relationship and the volatility dynamics among the variables. By focusing on the joint effects of macroeconomic and institutional instability, the study contributes to the literature and provides policy insights for promoting stable and sustainable Nigeria–U.S. trade relations.

2.0 Review of Related Literature and Theoretical Framework

2.1 Exchange Rate Volatility and Trade

Exchange rate volatility is widely recognized as a major source of uncertainty in international trade. Clark (1973) and Ethier (1973) argue that fluctuations in exchange rates increase transaction risks and discourage long-term trade contracts, particularly in economies with weak financial systems and limited hedging mechanisms. Empirical studies by Arize et al. (2000) and Bahmani-Oskooee and Hegerty (2007) show that stable

exchange rate environments promote trade by reducing transaction costs and enhancing price predictability, whereas persistent volatility tends to distort relative prices and increase the risk associated with cross-border transactions. From a macroeconomic perspective, the Marshall–Lerner condition suggests that currency depreciation may improve the trade balance if the combined elasticities of exports and imports exceed unity, while the J-curve hypothesis implies that such improvements may only materialize after an initial deterioration due to adjustment lags (Onakoya et al., 2019). Overall, the literature suggests that although moderate exchange rate movements may facilitate trade adjustment, persistent volatility is generally detrimental to trade, particularly in developing economies such as Nigeria.

2.2 Political Instability and Trade

Political instability constitutes an important constraint to international trade because it increases uncertainty, weakens institutions, and discourages investment. According to Alesina et al. (1996), frequent policy reversals, insecurity, and weak governance structures undermine investor confidence and increase transaction costs. Similarly, North (1990) and Rodrik (1999) emphasize that stable institutions and credible governance are essential for sustainable trade relations. Although periods of political tension may occasionally trigger compensatory policies that temporarily stimulate trade (Naleef & Masih, 2018), such effects are usually short-lived. In the case of Nigeria–United States trade, political instability can disrupt production and supply chains, raise risk premiums, and weaken trade competitiveness, thereby undermining the sustainability of bilateral trade flows.

2.3 Interaction between Exchange Rate Volatility and Political Instability

The literature on the joint effects of exchange rate volatility and political instability remains relatively limited. Yakubu et al. (2021) argue that the simultaneous occurrence of financial and institutional instability amplifies uncertainty and increases the risks faced by traders and investors. Similarly, Ugwu et al. (2022) show that stable exchange rate regimes enhance firm performance, whereas greater exchange rate flexibility introduces uncertainty with limited benefits. These findings suggest that political instability may intensify the adverse effects of exchange rate volatility on trade by creating a less predictable economic environment.

2.4 Empirical Review

Existing empirical studies provide considerable evidence that exchange rate volatility and political instability influence trade and economic performance. Arize et al. (2000), Aliyu (2010), and Su et al. (2019) demonstrate that exchange rate fluctuations and political conflicts significantly affect trade flows. Studies by Dalypop (2023), Carnazza et al. (2024), and Irfansyah and Wardaya (2025) further show that political stability promotes trade and economic integration, whereas instability undermines trade performance and increases economic uncertainty. Similarly, Munzhelele and Jeke (2025) report a short-run relationship between political instability and exchange rate movements, while Patric and Mobosi (2022) identify exchange rates as important determinants of Nigeria–United States bilateral trade. Although these studies provide valuable insights, they largely

examine exchange rate volatility and political instability independently. Consequently, little empirical attention has been devoted to their interaction effects, particularly in the context of Nigeria–United States bilateral trade. This gap provides the motivation for the present study.

2.5 Theoretical Framework

This study is anchored on the Gravity Model of Trade, originally propounded by Tinbergen (1962) and subsequently refined by Anderson (1979), Anderson and van Wincoop (2003), and Baldwin and Taglioni (2006). The model posits that bilateral trade flows are positively related to economic size and negatively related to trade barriers. In its modern form, the gravity model accommodates additional determinants beyond economic size and distance. Accordingly, this study adopts an augmented gravity framework by incorporating exchange rate volatility, political instability, and their interaction to explain Nigeria–United States bilateral trade over the period 1990Q1–2024Q4.

3.0 Methodology

3.1 Research Design

This study adopts an ex-post facto research design within a quantitative econometric framework, relying on time-series data to examine the interactional effects of exchange rate volatility and political instability on Nigeria–United States bilateral trade. The ex-post facto design is appropriate because the variables of interest exchange rate, political instability, and trade volume are already determined and cannot be manipulated by the researcher. Quarterly time-series data covering the period from 1990Q1 to 2024Q4 will be sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, the World Bank's World Development Indicators (WDI), and Word Governance Indicator (WGI).

3.2 Model Specification

The model incorporates bilateral trade as the dependent variable and includes exchange rate volatility (LERV), political instability (LPOL_NGN), and their interaction term (INTERACT)as main independent variables as well as exchange rate (EXR_NGNUS), GDP for Nigeria (LGDP_NGN) and the US (LGDP_US), and inflation rates for Nigeria and United States (LINF_NGN & LINF_US).

The functional form is expressed as:

$$BT = f(LERV, LPOL_NGN, INTERACT, EXR_NGNUS, LGDP_NGN, LGDP_US, LINF_NGN, LINF_US$$

The ARDL model with interaction term specified as:

$$NGUSLTB_t =, \beta_0 + \beta_1 LERV_t + \beta_2 POL_{NGN_t} + \beta_3 [LERV_t POL_{NGN_t}] + \beta_4 EXR_{NGN_t} + \beta_5 LGDP_{NGN_t} + \beta_6 LGDP_{US_t}, ++\beta_7 LINF_{NGN_t} + +\beta_6 LINF_{US_t} + \varepsilon_t$$

ARDL specification with interaction term as;

$$lnBT_t = \theta_0 + \theta_1 lnBT_{t-1} + \alpha_1 lnIMP_{t-1} + \alpha_2 lnEXP_{t-1} + \alpha_3 lnEXR_{t-1} + \alpha_4 lnFDI_{t-1} + \alpha_5 lnERV_{t-1} + \alpha_6 lnPOL_{t-1} + \alpha_7 lnINT_{t-1} + \alpha_5 lnGDP_{t-1} + \alpha_5 lnINFL_{t-1} + (lnERV_{t-1} \times lnPOL_{t-1}) \sum_{i=1}^{b} \beta_1 \Delta lnBT_{t-1} + \sum_{i=1}^{b} \beta_2 \Delta lnIMP_{t-1} + \sum_{i=1}^{b} \beta_3 \Delta lnEXP_{t-1} + \sum_{i=1}^{b} \beta_4 \Delta lnEXR_{t-1} + \sum_{i=1}^{b} \beta_5 \Delta lnFDI_{t-1} + \sum_{i=1}^{b} \beta_6 \Delta lnERV_{t-1} + \sum_{i=1}^{b} \beta_7 \Delta lnPOL_{t-1} + \sum_{i=1}^{b} \beta_8 \Delta lnINT_{t-1} + \sum_{i=1}^{b} \beta_9 \Delta lnGDP_{t-1} + \sum_{i=1}^{b} \beta_{10} \Delta lnINFL_{t-1} + \sum_{i=1}^{b} \beta_{11} (\Delta lnERV_{t-1} \times \Delta lnPOL_{t-1}) + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots (3.14)$$

The first part of the equation without Δ indicates long-run dynamics while the second part with Δ indicates the short-run dynamics. The bound testing approach is utilized to establish cointegration among the variables before estimating the equation.

3.3 Estimation Technique

Time-series econometric techniques were applied, ensuring stationarity among variables before regression estimation the study proceed to generate exchange rate volatility using Exponential Generalized Autoregressive Conditional Heteroschedasticity. Autoregressive Distributed Lag Model with interaction term (ARDL) was used to captures the combined influence of exchange rate volatility and political instability on Nigeria-US bilateral trade, similarly, Variance Inflation Factor (VIF) was used to detect multicollinearity.

4.0 Results and Presentation

	TRB_NGNUS	EXR_NGNUS	ERV	FDI_NGNUS	GDP_NGN	GDP_US	INF_NGN	INF_US	POL_NGN	POL_US
Mean	35107.04	756.4383	0.051891	73224.07	326.8250	15540.85	13.07253	2.970550	0.561992	0.439440
Median	34862.63	784.6021	0.051728	72800.40	327.8193	15198.95	12.96297	2.963688	0.569479	0.400669
Maximum	69235.40	1492.756	0.093796	143794.5	611.4555	25437.69	24.63466	5.632382	0.892972	0.986515
Minimum	1574.507	-50.90654	0.007522	3014.658	31.56344	5375.097	3.695195	0.303113	0.203242	0.014545
Std. Dev.	19783.04	433.8646	0.017797	41085.43	160.8514	5596.759	4.471114	1.015915	0.196249	0.275534
Skewness	0.044401	-0.017330	0.105907	-0.010025	-0.035380	-0.016623	0.300147	0.078590	-0.046880	0.350845
Kurtosis	1.780418	1.834251	2.768996	1.807079	1.865794	1.798087	2.663551	3.110486	1.803198	1.988119
Jarque-Bera	8.722383	7.934334	0.572996	8.303528	7.533347	8.433249	2.762377	0.215325	8.406572	8.844925

Probability	0.012763	0.018927	0.750889	0.015737	0.023129	0.014748	0.251280	0.897931	0.014946	0.012005
Sum	4914986.	105901.4	7.264804	1025137 0	45755.50	2175720.	1830.155	415.8769	78.67894	61.52161
Sum Sq. Dev.	5.44E+10	26165153	0.044027	2.35E+11	3596372.	4.35E+09	2778.729	143.4595	5.353405	10.55270
Observations	140	140	140	140	140	140	140	140	140	140

Table 1: Descriptive Statistics

Source: Author's Computation (2025)

The descriptive statistics in Table 1 reveal substantial variability across key variables influencing Nigeria–United States bilateral trade. The trade balance (TRB_NGNUS) shows wide fluctuations, reflecting unstable trade performance over time. The exchange rate (EXR_NGNUS) exhibits high volatility and persistent naira depreciation, while exchange rate volatility (ERV) remains moderate but consistent. Foreign Direct Investment (FDI_NGNUS) demonstrates significant instability, indicating uneven investment flows between both economies. Nigeria's GDP and inflation display greater variability compared to the US, indicating macroeconomic instability in Nigeria. Political instability is more pronounced in Nigeria than in the US, suggesting higher uncertainty that may adversely affect trade and investment. The Jarque–Bera (JB) test results indicate that most variables, including trade balance, exchange rate, and FDI, deviate from normal distribution due to policy shifts and external shocks, justifying the adoption of both symmetric and asymmetric models.

Table 3: Unit Root Test (ADF and PP test)

ADF				PP Test			
With Constant & Trend				**With Constant & Trend**			
Variables	**At Level**	**1st Diff**	**Status**	**Variables**	**At Level**	**1st Diff**	**Status**
TRB_NGNUS	-1.9446	-12.4046	I(1)	TRB_NGNUS	-1.8616	-12.4807	I(1)
	0.6257	***0.0000***			***0.6690***	***0.0000***	
	n0	***			n0	***	
EXR_NGNUS	-12.4314	-9.4054	I(0)	EXR_NGNUS	-12.4786	-68.3009	I(0)
	0.0000	***0.0000***			***0.0000***	***0.0001***	
	***	***			***	***	
ERV	-12.3516	-9.5077	I(0)	ERV	-12.3556	-125.6964	I(0)
	0.0000	***0.0000***			***0.0000***	***0.0001***	
	***	***			***	***	
FDI_NGNUS	-2.9942	-11.5258	I(1)	FDI_NGNUS	-3.3005	-11.5248	I(0)
	0.1376	***0.0000***			***0.0704***	***0.0000***	
	n0	***			*	***	
GDP_NGN	-12.5782	-13.6300	I(0)	GDP_NGN	-12.5559	-30.8004	I(0)
	0.0000	***0.0000***			***0.0000***	***0.0001***	
	***	***			***	***	
GDP_US	-12.0291	-11.6219	I(0)	GDP_US	12.0312	-61.6347	I(0)
	0.0000	***0.0000***			***0.0000***	***0.0001***	
	***	***			***	***	
INF_NGN	-11.3577	-10.0355	I(0)	INF_NGN	-11.3624	-58.2712	I(0)
	0.0000	***0.0000***			***0.0000***	***0.0001***	
	***	***			***	***	
INF_US	-12.9173	-14.6793	I(0)	INF_US	-12.8957	-157.8483	I(0)
	0.0000	***0.0000***			***0.0000***	***0.0001***	
	***	***			***	***	

POL_NGN	-13.1971 ***0.0000*** ***	-8.0624 ***0.0000*** ***	I(0)	POL_NGN	-13.2636 ***0.0000*** ***	-20.4000 ***0.0000*** ***	I(0)
POL_US	-10.1231 ***0.0000*** ***	-12.1400 ***0.0000*** ***	I(0)	POL_US	10.1385 ***0.0000*** ***	-36.1737 ***0.0001*** ***	I(0)

Source: *Author's Computation (2025)*

As shown in Table 3, the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) tests were conducted to examine the stationarity of variables influencing Nigeria–United States bilateral trade. The ADF results indicate that the trade balance (TRB_NGNUS) and foreign direct investment (FDI_NGNUS) are non-stationary at level but become stationary after first differencing, suggesting integration of order one, I(1). Conversely, variables such as the exchange rate (EXR_NGNUS), exchange rate volatility (ERV), GDP of both countries, inflation rates, and political instability indices are stationary at level, indicating integration of order zero, I(0). The PP test confirms the robustness of these findings, yielding consistent outcomes across variables. The presence of a mixed order of integration (I(0) and I(1)) validates the use of the Autoregressive Distributed Lag (ARDL) and its nonlinear extension (NARDL) models, which are appropriate for capturing both short-run and long-run relationships. This provides a strong econometric basis for investigating the symmetric and asymmetric effects of exchange rate volatility and political instability on Nigeria–United States bilateral trade dynamics.

4.1 Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH)

The Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model, developed by Nelson (1991), is an advanced approach to modeling volatility that builds upon the traditional GARCH framework. Unlike the standard GARCH model, EGARCH models the logarithm of the conditional variance, which guarantees that the estimated variances remain positive without imposing any parameter restrictions. Moreover, EGARCH effectively captures the asymmetric (leverage) effect, where negative shocks to returns tend to increase volatility more than positive shocks of the same size. This makes it a powerful tool for analyzing financial time series characterized by volatility clustering and asymmetry.

Table 4: ML ARCH - Normal distribution

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	-80687.79	8574.143	-9.410596	0.0000***
ERV	267.7299	116.2705	2.302646	0.0213**
POL_NGN	-4937.138	453.9717	-10.87543	0.0000***
POL_US	1547.972	167.8147	9.224291	0.0000***
	Variance Equation			
C(5)	2.499109	1.224157	2.041495	0.0412**
C(6)	1.181571	0.279033	4.234515	0.0000***
C(7)	0.488590	0.216246	2.259413	0.0239**
C(8)	0.829451	0.060164	13.78643	0.0000***

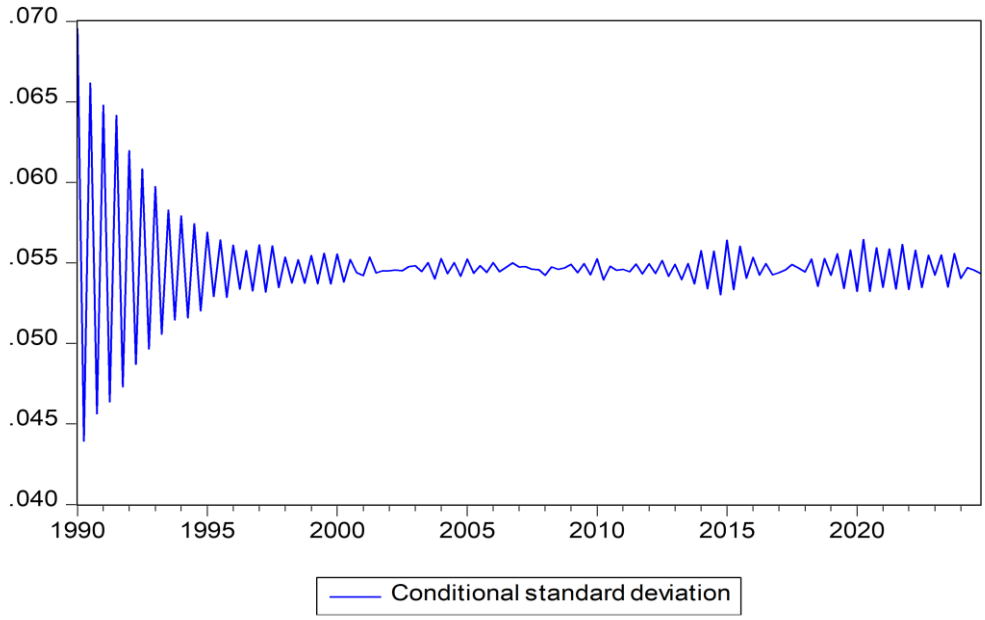
Source: Author Computation (2025)

The EGARCH estimation results provide in Table 4, key insights into the symmetric and asymmetric effects of exchange rate volatility (ERV) and political instability on Nigeria–US bilateral trade. In the mean equation, the constant term is negative and highly significant (C = -80,687.79; $p < 0.01$), indicating a strong downward baseline level in trade, possibly reflecting structural challenges or trade imbalances. Exchange rate volatility (ERV) has a

positive and statistically significant coefficient (267.73; p = 0.0213), suggesting that higher volatility in the exchange rate tends to increase trade value, which could indicate traders' efforts to hedge or exploit arbitrage opportunities amid uncertainty. Political instability in Nigeria (POL_NGN) has a large, negative, and significant effect (-4,937.14; p < 0.01), showing that rising domestic political instability significantly hampers bilateral trade with the US. In contrast, political instability in the US (POL_US) surprisingly has a positive and significant effect (1,547.97; p < 0.01), which may reflect trade diversion or increased demand for Nigerian goods during US political disruptions.

In the variance equation, the ARCH term (C(6) = 1.1816; p < 0.01) and GARCH term (C(8) = 0.8295; p < 0.01) are both significant and positive, confirming the presence of volatility clustering, where past shocks and past volatility influence current volatility. The leverage effect (C(7) = 0.4886; p = 0.0239) is positive and significant, suggesting the presence of asymmetric volatility, meaning that positive shocks (favourable news or stability) increase volatility more than negative shocks an unusual but empirically observed behavior in emerging market trade contexts. The constant in the variance equation (C(5) = 2.4991; p = 0.0412) is also significant, indicating a positive baseline level of conditional variance. These results align with prior literature (Nelson, 1991; Engle, 2001) that demonstrates the EGARCH model's strength in capturing both volatility persistence and asymmetry.
The findings support the study's objective by revealing that exchange rate volatility and political stability have both direct and volatility-inducing effects on Nigeria–US trade, with asymmetric dynamics indicating differentiated market responses to types of shocks

Figure 1: *EGARCH Exchange Rate Volatility (ERV) Shocks*



The EGARCH model result for exchange rate volatility (ERV), depicted in Figure 1, indicates that volatility was initially high, with sharp fluctuations suggesting strong market reactions to early shocks or policy disturbances. Over time, the conditional standard deviation declined steadily, demonstrating a mean-reverting behavior where volatility gradually returned to a stable level. Occasional mild spikes appeared in the middle and later periods, reflecting short-lived disturbances likely caused by temporary economic or political events. Toward the end of the sample, volatility became relatively low and stable, implying improved market adjustment and reduced uncertainty. The EGARCH estimation captures the

asymmetric nature of exchange rate behavior, where negative shocks had a greater impact on volatility than positive ones, consistent with the leverage effect in financial time series.

Table 5: Post-estimated Diagnostic Test of EGARCH Results

Test	Coefficient/Jargue-Bera	P-Value
EGARCH MODEL		
Normality Test	224.4428	0.0000
Residual Heteroskedasticity Test	0.108263	0.7428

Source: Author Computation (2025)

As presented in Table 5 for the EGARCH model, the normality test (Jarque-Bera = 224.4428, p = 0.0000) also rejects the null hypothesis of normality, reinforcing the evidence of non-normal residuals. Despite this, the residual heteroskedasticity test (LM test = 0.108263, p = 0.7428) is again not significant, which confirms that the EGARCH model effectively addressed volatility clustering and removed ARCH effects from the residuals, while both models violate normality assumption (as is typical in volatility modeling), the lack of significant heteroskedasticity in residuals indicates that the models are well-specified for capturing the conditional variance dynamics of the data (Engle, 2001; Bollerslev, 1986).

Table 6: Bound F-Statistics Cointegration

Test Statistics	Value	K
F-Statistic	7.416254	9
	Critical Value Bounds	
Significance	1(0) Bound	1(1) Bound
10%	1.8	2.8
5%	2.04	3.08
1%	2.5	3.68

Source: *Author computation (2025)*

The result of the Bound F-Statistics Cointegration Test presented in Table 6 reveals an F-statistic value of 7.416254, which exceeds the upper critical bound I(1) value of 3.68 at the 1% significance level. This indicates that the null hypothesis of no long-run relationship among the variables can be rejected, confirming the existence of a long-run cointegrating relationship between Nigeria–United States bilateral trade, exchange rate volatility, and political instability. The implication of this finding is that variations in exchange rate movements and political conditions have a sustained influence on trade between the two countries. In other words, in the long run, fluctuations in the exchange rate and instability in the political environment significantly affect the volume and stability of Nigeria–U.S. trade. This outcome justifies the inclusion of an Error Correction Model (ECM) in the subsequent analysis to capture both the short-run adjustments and the long-run equilibrium dynamics of the relationship, thereby providing robust evidence that Nigeria–U.S. trade is sensitive to macroeconomic and political conditions over time.

Table 7: Combined Interactional effect of exchange rate volatility and political instability

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	27.28	47.83	0.570	0.5697
LERV	14.46	4.24	3.41	0.0009***
LPOL_NGN	64.34	11.65	5.52	0.0000***
INTERACT	-13.51	2.40	-5.63	0.0000***
EXR_NGNUS	-2.41	0.32	-7.45	0.0000***
LGDP_NGN	-6.98	1.05	-6.65	0.0000***
LGDP_US	4.00	1.73	2.31	0.0231**
LINF_NGN	5.25	1.03	5.08	0.0000***
LINF_US	-11.09	4.50	-2.46	0.0155**

Source: Author Computation (2025)

The regression analysis of Nigeria–US bilateral trade shown in Table 7 reveals a detail but critical relationship between exchange rate volatility and political instability. Exchange rate volatility (LERV) alone shows a positive and statistically significant effect on trade (coefficient = 14.46; $p < 0.001$), suggesting that fluctuations in the naira-dollar rate may, under stable conditions, stimulate trade by creating arbitrage or hedging opportunities. However, the model also introduces an interaction term between exchange rate volatility and political instability (INTERACT), which is strongly negative and highly significant (coefficient = –13.51; $p < 0.001$). This negative interaction effect clearly demonstrates that when both exchange rate volatility and political instability occur simultaneously, their combined effect reduces bilateral trade between Nigeria and the US. In practical terms, although firms may tolerate currency swings under stable governance, the presence of political uncertainty intensifies overall risk and discourages both exports and imports. This finding is consistent with Yakubu *et al.* (2021), who argue that while financial market participants can adapt to exchange rate shifts, they are far less responsive and often risk-averse when political institutions are weak or unpredictable.

In a seemingly counterintuitive result, political instability (LPOL_NGN) on its own exhibits a strong positive and statistically significant impact on trade. This may be explained by the economic behavior of governments during periods of political crisis. Instability often forces policymakers to implement emergency reforms such as naira devaluation, easing of trade restrictions, or aggressive export incentives to stabilize the economy and appease markets. These reactive policies may stimulate trade temporarily, even as they mask underlying systemic issues. Naleef and Masih (2018) refer to this phenomenon as "crisis-induced trade booms," where short-term trade expansion is driven not by sustainable economic strength but by opportunistic or compensatory policies. In Nigeria, such episodes are not uncommon, especially during election cycles or political unrest, when currency weakness fuels export competitiveness, albeit briefly and often without durable structural reform.

Other macroeconomic variables also align with economic expectations. The negative coefficient on the naira-dollar exchange rate (EXR_NGNUS) implies that a weaker naira reduces Nigeria–US trade in the short term, reinforcing the short-run implications of the J-curve theory. According to Onakoya *et al.* (2019), currency depreciation initially worsens trade performance before potential correction, due to delays in price adjustments and trade contract rigidities. Furthermore, Nigeria's domestic GDP has a negative impact on trade,

likely because economic growth reduces dependency on imports through increased local production. In contrast, growth in US GDP positively influences trade, as it raises the demand for foreign (including Nigerian) goods. Inflation shows mixed effects: rising Nigerian inflation is associated with increased nominal trade flows, possibly driven by exchange rate pass-through, while US inflation suppresses trade volumes due to a decline in purchasing power and global competitiveness of American products.

The findings emphasize the importance of managing the combined interaction of exchange rate volatility and political instability. While either factor alone may not always threaten trade and might even promote it under certain circumstances their joint presence significantly dampens bilateral trade flows, reinforcing the critical role of institutional stability. This confirms earlier assertions by Sambo *et al.* (2021) that financial openness and macroeconomic flexibility can only be effective when supported by credible governance structures. Therefore, Nigeria's policymakers must prioritize political stability, institutional reform, and transparency in monetary policy to harness the potential benefits of currency adjustments. Only by controlling political risk can Nigeria effectively leverage exchange rate volatility to promote sustainable and predictable trade growth.

Table 8: Result of Error Correction (ECM)
Selected Model: ARDL(1, 0, 0, 0, 0, 1, 0, 0, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CointEq(-1)*	-0.039139	0.000218	-41.82417	0.0000

Source: *Author computation (2025)*

The coefficient of the lagged error-correction term, CointEq(−1) = –0.039139 in table 8, is negative and statistically significant at the 1% level (p = 0.0000). This confirms that a valid long-run equilibrium relationship exists between Nigeria–US bilateral trade and the explanatory variables, including the interaction between exchange rate volatility and political instability. The magnitude of the coefficient implies that approximately 3.9% of short-run deviations from the long-run equilibrium are corrected each quarter. Although the speed of adjustment is relatively slow, it indicates that when bilateral trade diverges from its long-run path due to shocks in exchange rate volatility, political instability, or their interaction the system gradually adjusts back toward equilibrium.

Table 10: Post-estimated Diagnostic Test of Combined Interactional effect of exchange rate volatility and political instability

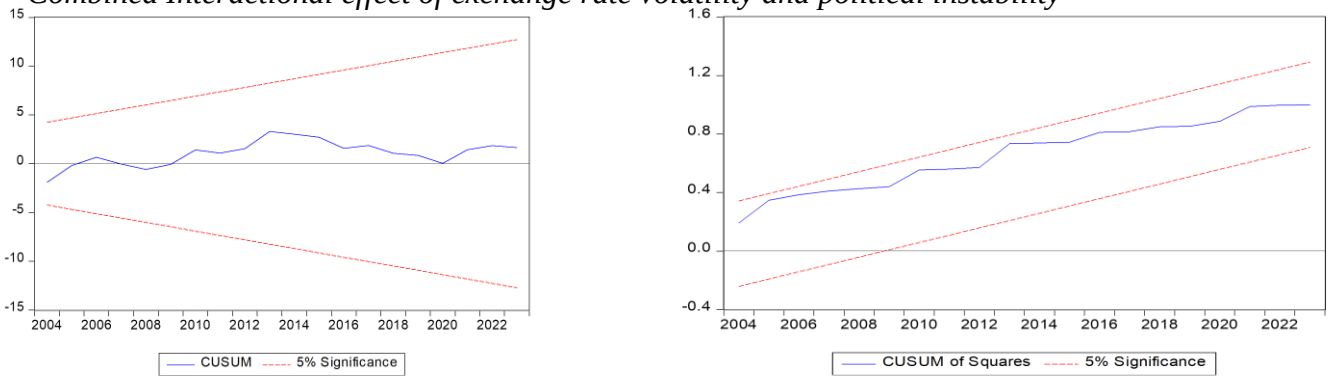
Test	Coefficient/Jargu-Bera	P-Value
Serial Correlation LM Test	0.663271	0.8273
Residual Heteroskedasticity Test	1.343210	0.4148
Jargu-Bera Residual Normality Test	0.068234	0.865248

Source: Author Computation (2025)

Table 10 present the post-estimation diagnostic tests conducted to validate the regression model that analyze the results combined interactional effects of exchange rate volatility and political instability indicate that the model satisfies key classical linear regression assumptions. The Breusch-Godfrey LM test for serial correlation yields a test statistic of 0.663271 with a p-value of 0.8273, suggesting that there is no evidence of autocorrelation in the residuals. This indicates that the residuals are independently distributed over time, ensuring the reliability of the model's statistical inferences. Similarly, the test for

heteroskedasticity (likely the Breusch-Pagan or White test) reports a test statistic of 1.343210 and a p-value of 0.4148. The failure to reject the null hypothesis of homoscedasticity implies that the variance of the residuals is constant across observations, confirming that the model's standard errors are unbiased and efficient. Lastly, the Jarque-Bera test for normality of residuals presents a test statistic of 0.068234 and a p-value of 0.8652, providing strong evidence that the residuals are normally distributed. This supports the validity of t-tests and F-tests, especially in small samples. Collectively, the absence of serial correlation, heteroskedasticity, and non-normality in the residuals suggests that the model is statistically robust and well-specified, reinforcing the reliability of the estimated coefficients and the conclusions drawn from the regression analysis.

Figure 2**:** *Cumulative Sum of Recursive Residuals of Cusum and Cusum of Square of Combined Interactional effect of exchange rate volatility and political instability*



Source: Author Computation (2025)

The Cumulative Sum (CUSUM) and CUSUM of Squares diagnostic tests presented in Figure 2 were conducted to assess the stability of the regression model examining the combined interactional effects of exchange rate volatility and political instability. The CUSUM plot shows that the cumulative sum of recursive residuals remains well within the 5% significance boundaries throughout the entire sample period, indicating that there is no evidence of structural instability in the model. This suggests that the estimated relationship between exchange rate volatility, political instability, and the dependent variable is stable over time, reinforcing the model's reliability. Similarly, the CUSUM of Squares test, which is more sensitive to changes in variance and potential parameter instability, also shows that the test statistic remains within the critical bounds, although it gradually trends upward. The fact that it does not cross the 5% significance lines implies that there is no significant deviation or break in the variance of the residuals or in the behavior of the coefficients. Collectively, these results confirm that the model is structurally stable, and the estimated parameters remain consistent across the period analyzed. This enhances confidence in the robustness of the model and supports its validity for interpreting the interaction effects and making informed policy recommendations.

5.0 Discussion of Results

The descriptive statistics reveal considerable variability in the major indicators shaping Nigeria United States bilateral trade. The trade balance (TRB_NGNUS) exhibits large fluctuations over the sample period, indicating persistent instability in Nigeria's external sector. Exchange rate movements also display high dispersion, while the mean exchange rate level confirms long term depreciation of the naira. Measures of political instability in Nigeria show much higher volatility than those of the United States, reflecting Nigeria's fragile

institutional and macroeconomic environment. The Jarque–Bera statistics show that most variables deviate from normality, thereby justifying the use of linear and volatility-sensitive estimation techniques such as ARDL, and EGARCH.

The correlation analysis provides further insight into the relationships among variables. Trade balance shows strong positive correlations with exchange rate levels, GDP, and FDI, suggesting that economic expansion and capital inflows support trade flows between Nigeria and the United States. However, exchange rate volatility and political instability demonstrate negative correlations with trade, indicating that uncertainty undermines export and import performance. These preliminary results align with expectations for developing economies where volatility and institutional instability are major obstacles to achieving trade gains. The mixed order of integration some variables stationary at level (I(0)) while others become stationary at first difference I(1) supports the use of the ARDL model. The Bound test confirms long-run cointegration, with an F-statistic of 7.416, which exceeds the 1% upper critical bound of 3.68, indicating a stable long-run relationship among trade, volatility, political instability, GDP, inflation, and FDI.

The EGARCH model provides critical evidence on the influence of volatility and political instability. In the mean equation, exchange rate volatility (ERV) has a positive and significant effect on trade, with a coefficient of 267.73 ($p = 0.0213$). This suggests that traders may exploit short-term currency movements or that periods of volatility coincide with increased import demand. Political instability in Nigeria exhibits a strong negative and highly significant effect on trade, with a coefficient of –4,937.14 ($p = 0.0000$), confirming that instability disrupts production, investment, and trade-related logistics. In contrast, U.S. political instability exerts a positive and significant influence on Nigeria–U.S. trade, with a coefficient of 1,547.97 ($p = 0.0000$), potentially reflecting trade diversion or increased Nigerian exports during episodes of U.S. domestic uncertainty.

The volatility equation shows significant ARCH and GARCH effects: the ARCH term is 1.18 ($p < 0.01$) and the GARCH term is 0.83 ($p < 0.01$), confirming strong volatility persistence in the exchange rate. The significant leverage effect indicates that positive shocks generate more volatility than negative shocks, a common pattern in emerging markets.

The ARDL short run and long run results provide further validation. The error correction term (ECM) is negative and significant at –0.039 ($p < 0.01$), indicating that approximately 3.9% of deviations from the long-run equilibrium are corrected each quarter. Although this speed of adjustment is relatively slow, it is statistically meaningful and shows that trade flows gradually converge to long-run equilibrium following shocks.

The interaction model reveals the most important finding of the study. Exchange rate volatility alone has a positive and highly significant impact on trade, with a coefficient of 14.46 ($p < 0.01$). Political instability (POL_NGN) also shows a positive and significant independent effect on trade, with a coefficient of 64.34 ($p < 0.01$), suggesting that during political disruptions, emergency trade incentives or currency adjustments may temporarily boost trade flows. However, when both factors operate simultaneously, their combined effect becomes strongly negative, as reflected in the interaction term coefficient of –13.51 ($p < 0.01$). This indicates that political instability compounds the harmful effects of exchange rate volatility, thereby significantly reducing bilateral trade. Thus, while each factor may create temporary or artificial increases in trade, their combination disrupts Nigeria–U.S. trade dynamics.

The diagnostic statistics confirm the robustness of the model. There is no evidence of serial correlation (LM statistic = 0.663; p = 0.827), no heteroskedasticity (Chi-square = 1.343; p = 0.4148), and no multicollinearity (all VIFs < 1.20). The residuals are normally distributed (Jarque–Bera = 0.068; p = 0.865), confirming that the model is well specified.

6.0 Conclusion

This study demonstrates that exchange rate volatility and political instability play crucial but structurally different roles in shaping Nigeria U.S. bilateral trade. While both variables may independently exert positive effects under specific conditions, their combined interaction substantially weakens trade performance. The results highlight that macroeconomic policies particularly those targeting exchange rate management cannot operate effectively in the absence of political stability. The empirical findings further emphasize that Nigeria's trade performance is not solely a function of price competitiveness or market conditions, but is deeply influenced by broader governance and institutional environments. Without credible political institutions and consistent policy direction, exchange rate adjustments and trade interventions yield suboptimal or short term results. Ensuring a stable political climate is therefore indispensable for sustaining and enhancing Nigeria U.S. trade relations. The government should strengthen political stability and institutional governance by implementing reforms that enhance regulatory transparency, uphold the rule of law, ensure policy continuity, and reduce security related disruptions that negatively affect Nigeria U.S. trade relations.

Industries and firms should promote domestic industrialization and export diversification by expanding local production capacity and investing in non-oil export sectors to reduce import dependence and vulnerability to exchange rate shocks. Government agencies should strengthen policy coordination by aligning fiscal, monetary, and trade policies and improving collaboration between key institutions such as the Central Bank, Ministry of Finance, and trade authorities to avoid conflicting or inconsistent measures.

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