Gusau Journal of Economics and Development Studies (GUJEDS),
vol 7, no 1 August, 2026 ISSN: 2786-9695 (Print) 3027-1126 (Online)

THE MODERATING ROLE OF FISCAL POLICY ON THE RELATIONSHIP BETWEEN RESOURCE ENDOWMENT AND REAL EXCHANGE RATE VOLATILITY

DOI: https://doi.org/10.57233/gujeds.v7i1.19

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Abstract *Nigeria's real exchange rate has remained persistently volatile, posing significant challenges to macroeconomic stability, trade competitiveness, and fiscal management, and this instability, compounded by the country's heavy reliance on natural resource wealth, motivated the present investigation into whether fiscal policy moderates the relationship between resource endowment and real exchange rate volatilityover the period 1990–2024.The study employed the Autoregressive Conditional Heteroskedasticity (ARCH) model and the Smooth Threshold Regression (STR) model. The ARCH results revealed that natural resource rents significantly depreciate the real exchange rate, contrary to the conventional resource curse expectation of appreciation, and that this effect is reinforced when resource revenue is channeled into government expenditure but reversed when financed through fiscal deficits, while an asymmetric volatility term confirmed that positive and negative shocks affect exchange rate volatility differently. The STR results further showed that the resource endowment-volatility relationship is regime-dependent, with a statistically significant threshold at a government expenditure value of 0.725962: below this point, higher spending and resource rents heighten volatility, while beyond it, the relationship inverts and further spending dampens volatility. The study concludes that fiscal policy is not a passive factor*

but an active mechanism that determines both the direction and intensity of the resource-exchange rate relationship, with a definite tipping point separating destabilizing from stabilizing fiscal regimes. It is recommended that fiscal authorities deliberately scale government expenditure beyond the identified threshold, prioritize productive expenditure over deficit financing, and design countercyclical buffers that account for the asymmetric nature of resource-driven exchange rate shocks.

Keywords Fiscal Policy, Resource Endowment, Real Exchange Rate Volatility, Resource Rents, and Trade Openness

JEL Classification: F31, E62 & Q33

1.0 Introduction

The real exchange rate (RER), defined as the relative price of domestic goods to foreign goods adjusted for price differentials, is a key indicator of external competitiveness and macroeconomic stability, particularly in economies characterized by structural imbalances such as Nigeria. The real exchange rate captures the interaction between the nation's nominal value and inflation differentials, thereby reflecting the purchasing power of the domestic currency in international markets. It determines whether domestic goods are relatively cheap or expensive compared to foreign goods, with real depreciation enhancing export competitiveness and real appreciation reducing it. Oladutire *et al.* (2024) emphasized that the exchange rate is a critical macroeconomic variable influencing output growth, trade flows, and purchasing power in Nigeria. Given Nigeria's structural dependence on natural resources and high import propensity, movements in the real exchange rate significantly affect inflation dynamics, balance of payments stability, and industrial productivity.

Furthermore, Nigeria's history of shifting exchange rate regimes from the fixed exchange rate system prior to the Structural Adjustment Programme (SAP) in 1986 to various market-based and managed float arrangements thereafter has contributed significantly to fluctuations in the real exchange rate. Real Effective Exchange Rate (REER) index revealed substantial variations in the external value of the naira over time. The REER index stood at 482.73 in 1985 but declined sharply to 71.02 in 1990 following the introduction of SAP and exchange rate liberalization policies. The index subsequently fell further to 49.75 in 1992 before rebounding to 160.10 in 1995 and rising to 273.01 in 1998. However, the REER dropped again to 70.16 in 2000, which shows the new adjustments in the exchange rate system. Thereafter, the index increased moderately from 86.27 in 2005 to 100.00 in 2010 and further to 124.46 in 2014, indicating periods of real appreciation. Following the 2014 oil price shock and subsequent foreign exchange market pressures, the REER declined to 119.09 in 2015 but experienced slight appreciation thereafter, until 2020 that it fell to 119.5 and fell drastically in 2024 to 63.93 (World Bank, 2025). These persistent swings in real exchange rate makes it a

critical variable in Nigeria's macroeconomic management.

While the level of the real exchange rate provides information on a country's external competitiveness, its volatility captures the degree of uncertainty associated with currency movements and is therefore more relevant for investment decisions, trade planning, and long-term economic growth. The real exchange rate volatility refers to the magnitude and frequency of fluctuations in the real exchange rate over time which reflects instability in the purchasing power and external value of the domestic currency (Esomnofu & Okpalanwabude, 2025). In Nigeria, periods of heightened volatility have often coincided with major oil price shocks, foreign exchange shortages, and policy adjustments (Olalere,2026). For instance, the collapse in global oil prices in 2014–2016, the COVID-19-induced economic disruptions in 2020, and the foreign exchange market reforms implemented in 2023–2024 generated significant exchange rate pressures and heightened uncertainty. Such volatility is driven by both external factors, particularly fluctuations in crude oil prices and global financial conditions, and domestic macroeconomic imbalances, including fiscal deficits, inflationary pressures, and monetary policy inconsistencies. Moreover, macroeconomic variables such as trade openness, government expenditure, interest rate dynamics, and fiscal policy actions have been identified as important determinants of real exchange rate volatility in Nigeria (Ajao & Igbekoyi, 2013).

Nigeria being a resource-rich economy is typically characterized by high dependence on primary commodity exports, which exposes the nation to fluctuations in global commodity prices and external demand conditions. These fluctuations generate unstable foreign exchange inflows, leading to cyclical pressures on the domestic currency and consequently, increased real exchange rate volatility. Resource endowment, measured by total natural resource rents as a percentage of GDP, reflects the extent to which the economy depends on extractive resource revenues. The variations in resource rents and export revenues contribute to instability in foreign reserves and external balances (Nwachukwu *et al*., 2024; Amare *et al*., 2024). Furthermore, the broader literature on resource endowment and the "resource curse" suggests that economies with abundant natural resources often experience macroeconomic instability due to weak diversification, procyclical fiscal behaviour and susceptibility to external shocks, all of which amplifies exchange rate fluctuations (Shao & Yang, 2021; Oduyemi *et al.,* 2024). In addition, resource endowment does not merely influence the level of the real exchange rate in Nigeria but acts as a key transmission channel through which external shocks and domestic structural weaknesses translate into persistent and often unpredictable real exchange rate volatility.

Importantly, fiscal policy may not only influence exchange rate dynamics but also condition the extent to which resource endowment translates into exchange rate volatility, thereby playing a moderating role in the economy. In Nigeria, fiscal policy is largely driven by the structure of resource endowment, as government revenue is heavily dependent on proceeds from natural resources, thereby making fiscal operations highly sensitive to external commodity price

fluctuations. This dependence often results in procyclical fiscal behaviour, where government spending expands during periods of resource booms and contracts during downturns, thereby amplifying macroeconomic instability and transmitting external shocks into the domestic economy (Shao & Yang, 2021). Furthermore, fiscal policy plays a crucial role in exchange rate determination through channels such as budget deficits, public spending, and debt accumulation, which influence money supply, inflation, and foreign exchange demand. Ayinde and Bankole, (2021) noted that fiscal imbalances and government expenditure significantly affect exchange rate movements in Nigeria. Recent studies further show that financial stress, external shocks, and fluctuations in foreign reserves are largely driven by resource earnings which interact with fiscal conditions to increase exchange rate instability in Nigeria (Nwachukwu *et al.,* 2024; Penzin & Salisu, 2025).

These dynamic linkages among fiscal policy, resource endowment and real exchange rate volatility in Nigeria presents a set of persistent macroeconomic challenges that justify comprehensive investigation. Resource dependence, particularly on oil and other primary commodities, generates volatile revenue flows, which in turn influence government fiscal behaviour, often resulting in procyclical spending and budget deficits that exacerbate macroeconomic instability. This volatility in fiscal resources directly impacts the foreign exchange market which contribute to fluctuations in the real exchange rate, all of which undermines trade competitiveness, investment decisions and overall economic planning. Furthermore, the lack of economic diversification, weak institutional frameworks and susceptibility to external shocks compound these challenges, making Nigeria particularly vulnerable to sudden swings driven by fiscal imbalances and resource revenue shocks.

Despite extensive empirical literature on exchange rate dynamics, most studies examine the effects of resource endowment, fiscal policy, and macroeconomic variables in isolation. There is limited empirical evidence on the interactive relationship between resource endowment and fiscal policy, particularly regarding how fiscal policy moderates the impact of resource dependence on real exchange rate volatility. Furthermore, the potential for nonlinear and regime-dependent dynamics in this relationship remains largely unexplored in the Nigerian context. Against this backdrop, this study investigates the moderating role of fiscal policy on the relationship between resource endowment and real exchange rate volatility in Nigeria over the period 1990–2024. The study employs the Autoregressive Conditional Heteroskedasticity (ARCH) model to capture volatility clustering and the Smooth Transition Regression (STR) model to account for nonlinear regime shifts. This approach provides a more comprehensive understanding of how fiscal policy interacts with resource endowment to influence exchange rate volatility under different macroeconomic conditions.

2.0 Literature Review

The dynamics of real exchange rate volatility in resource-rich economies are shaped by the interaction between resource endowment, fiscal policy, and

macroeconomic fundamentals, requiring a structured theoretical and empirical examination. The Dutch Disease Theory which was first articulated by Corden and Neary (1982), provides a structural explanation for how resource wealth, through large export inflows, can lead to real exchange rate appreciation, overvaluation of the domestic currency, and reduced competitiveness of non-resource tradable sectors. The theory assumes a small open economy with a booming resource sector, a non-resource tradable sector, and a non-tradable sector, alongside labour mobility and expenditure effects that reallocate resources across sectors. Its basic tenets highlight that resource booms, if unmanaged, can generate macroeconomic instability by inducing de-industrialization, crowding out non-resource sectors, and amplifying susceptibility to external shocks. Beyond its implications for exchange rate levels, the Dutch Disease framework also implies that fluctuations in resource revenues can induce exchange rate volatility through unstable foreign exchange inflows and procyclical fiscal responses. The theory shows the importance of fiscal policy as a moderating mechanism by smoothing resource revenue shocks, managing aggregate demand, and influencing foreign exchange supply through public expenditure and fiscal balances. This implies that carefully designed countercyclical spending, stabilization funds, and strategic investment in diversified sectors can mitigate the adverse effects of exchange rate fluctuations associated with resource dependence (Corden & Neary, 1982; Sala-i-Martin & Subramanian, 2013).

Complementing this structural lens, the Intertemporal Approach to the Real Exchange Rate by Obstfeld and Rogoff (1995) conceptualizes the real exchange rate as the outcome of forward-looking, intertemporal consumption, saving, and investment decisions in an open economy. It assumes that agents are utility-maximizing, responsive to relative prices and returns across countries, and that capital is internationally mobile. The theory posits that the real exchange rate is determined not only by current resource inflows and fiscal conditions but also by expected future economic fundamentals, including anticipated fiscal adjustments, resource shocks, and monetary policy actions. In Nigeria, this implies that fiscal policy does not merely react to resource-driven revenue fluctuations but can actively moderate the impact of these shocks on real exchange rate volatility by shaping expectations, smoothing expenditure patterns, and influencing foreign exchange supply and demand (Obstfeld & Rogoff, 1995). The intertemporal approach suggests that real exchange rate dynamics are influenced by expectations of future fiscal and resource conditions, implying that credible fiscal policy can stabilize exchange rate volatility by anchoring expectations

Empirical studies on how fiscal policy moderates the relationship between resource endowment and real exchange rate volatility are broadly categorized into three strands. The first strand focuses on volatility modeling using ARCH/GARCH frameworks. For instance, Ajao and Igbekoyi (2013) used GARCH (1,1) technique to identify principal determinants of real exchange rate volatility in Nigeria. They found that that openness of the economy, government expenditures, interest rate movements as well as the lagged

exchange rate are among the major significant variables that influence real exchange rate volatility. Also, Iliyasu *et al.* (2024) investigated the impact of monetary policy on exchange rate volatility in Nigeria using ARCH, and VECM. The results confirm the presence of exchange rate conditional volatility and establish a long-run relationship, showing that money supply and past exchange rate fluctuations significantly drive volatility.

The second strand examines the role of fiscal policy and exchange rate nexus. Yousef (2026) applied a Panel Autoregressive Distributed Lag (ARDL) model across 16 MENA countries (2000–2023) to investigate macroeconomic determinants of renewable energy security, finding a significant long-run cointegrating relationship in which fiscal policy promotes energy security, whereas inflation and economic volatility undermine it, with a relatively fast speed of adjustment to equilibrium. However, Ayinde and Bankole (2021) investigated fiscal dominance and exchange rate stability using a Structural Vector Autoregression (SVAR) framework to trace shock transmission from fiscal deficits to exchange rate changes and the study found that fiscal imbalances have destabilizing effects on the naira.

The third strand explores resource endowment, exchange rate volatility and broader macro-financial linkages, with studies such as Esomnofu and Okpalanwabude (2025) employed an Autoregressive Distributed Lag (ARDL) bounds testing approach to investigate the effect of exchange rate volatility on the country's trade balance and the study concluded that volatility has a significant negative impact, particularly on trade outcomes. Olalere (2026) studied oil price volatility, macroeconomic instability and economic growth in selected SSA countries using Auto-Regressive Distributed Lag (ARDL). The empirical findings revealed that in the long run, oil price volatility and inflation exhibit significant positive relationships with economic growth, suggesting the presence of oil-driven revenue effects and inflationary growth transmission in the selected economies. Similarly, Nwachukwu et al. (2024) applied Vector Autoregression (VAR) to examine the dynamic relationship between foreign reserve levels and exchange rate volatility in Nigeria, suggesting that reserves help dampen volatility but are sensitive to external shocks in oil revenues and global financial conditions. Penzin and Salisu (2025) used a predictability modeling approach (Westerlund–Narayan forecast evaluation technique) to test whether financial stress indicators can forecast exchange rate volatility for the naira against major currencies, showing that financial stress, especially when oil prices are included, improves volatility predictions. However, Oduyemi et al. (2024) showed that there is no long-run connection between pump prices for gasoline, oil rents, exchange rates, inflation rates, and the poverty gap in Nigeria. The results revealed that the official exchange rate and oil rents exert an insignificant positive effect in the short run.

Amare *et al.* (2024) used system GMM; Dynamic Panel Threshold Regression to assess how natural resource endowments relate to economic growth and highlight that while resource wealth can boost growth, poor management exacerbates volatility effects. Similarly, Zhan et al. (2021) applied

cross-country comparative econometric analysis to explore how exchange rate regimes interact with the resource curse, demonstrating regime-specific effects on volatility. Kouladoum et al. (2026) also examined the effect of natural resource rents on macroeconomic instability in 54 African countries over 2000–2022 using a two-step system GMM estimator, constructing a composite instability index from inflation, exchange rate, interest rate, and unemployment fluctuations. Their findings reveal a nonlinear (dual) relationship, where resource rents initially stabilize but eventually increase macroeconomic instability, with consistent effects across labour, financial, and external sectors, thereby emphasizing the risks of overdependence on resource revenues. Edgeweblime and Tchetche (2025) employed a Poisson Pseudo-Maximum Likelihood (PPML) gravity model on bilateral trade data within West African Economic and Monetary Union (2002–2022), complemented by a dynamic Computable General Equilibrium (CGE) simulation, to show that exchange rate volatility and tariff disparities significantly depress intra-regional trade, while policy coordination and volatility reduction could substantially enhance trade and industrial output.

Despite these contributions, important gaps remain in the literature. First, existing studies largely treat fiscal policy as an independent determinant rather than explicitly modeling its moderating role in the resource–exchange rate relationship. Second, most studies adopt single-method approaches, such as ARDL, VAR, GARCH, or system GMM, which capture either structural relationships or volatility dynamics but not both simultaneously. Third, there is limited integration of nonlinear modeling techniques with volatility frameworks in a unified empirical model. This study addresses these gaps by combining ARCH-based volatility modeling with Smooth Transition Regression (STR) to capture both volatility persistence and regime-dependent dynamics, while explicitly incorporating fiscal policy as a moderating factor in the relationship between resource endowment and real exchange rate volatility.

3.0 Methodology

This study adopts a quantitative time-series research design using annual data from 1990 to 2024 to examine the moderating role of fiscal policy on the relationship between resource endowment and real exchange rate volatility in Nigeria. The analysis is anchored on the Intertemporal approach to the real exchange rate, which posits that exchange rate dynamics are influenced by consumption behavior, fiscal policy, and resource shocks through their effects on aggregate demand and external balances. The real exchange rate is specified as:.

$$RER_t = E_t \times \frac{P_t}{P_t^*} \qquad 3.1$$

Where; P_t = domestic price level, $\frac{P_t}{P_t^*}$ = foreign price level and E_t = nominal exchange rate and RER measures the relative price of domestic goods to foreign goods.

$$U^i(C_t) = \beta\, E_t \{U^i(C_{t+1}) \frac{RER_{t+1}}{RER_t}\} \qquad 3.2$$

$U^i(C_t) =$ marginal utility of domestic consumption and β = discount factor. This equates the marginal utility of consumption today with the expected discounted marginal utility tomorrow, adjusted for RER movements.

$$C_t + B_t = Y_t + (1 + i_{t-1})B_{t-1} - T_t \qquad 3.3$$

C_t = domestic consumption, B_t = domestic bond holdings, Y_t = domestic output, T_t = taxes and

i_{t-1}=domestic interest rate. This shows that consumption plus savings must equal after-tax income, linking fiscal policy and resource income to RER.

$$Y_t = \bar{y} + \gamma \text{TNRR}_t + \varepsilon_t \qquad 3.4$$

TNRR_t is the total natural resource rents and ε_t is stochastic output shock. This captures how resource wealth influences domestic output, which affects consumption and RER through intertemporal allocation.

$$1 + i_t = (1 + i_t^*) \frac{E_t\{E_{t+1}\}}{E_t} \qquad 3.5$$

i_t, i_t^* are the domestic and foreign interest rates which ensures no arbitrage in international capital markets, linking expected nominal exchange rate changes to interest differentials

$$RER_t = \frac{U^i(C_t^*)}{U^i(C_t)} \qquad 3.6$$

Where
C_t^* *is the* foreign consumption. Shows that the real exchange rate is determined by the relative marginal utilities of consumption across countries, capturing the intertemporal allocation of resources and the effects of fiscal policy and resource shocks on RER dynamics.

$$RER_t = \alpha_0 + \alpha_1 TNRR_t + \alpha_2 GEX_t + \alpha_3(TNRR_t \times GEX_t) + \cdots \varepsilon_t \qquad 3.7$$

The study modified the model of Ajao and Igbekoyi (2013) who examined the determinants of real exchange rate volatility in Nigeria using GARCH. To capture exchange rate volatility, the study employs a GARCH(1,1) model. The mean equation is specified as:

$$RER_t = \alpha_0 + \alpha_1 TNRR_t + \alpha_2 FD_t + \alpha_3 TO_t + \alpha_4 INF_t + \alpha_5 GEX_t + \varepsilon_t \qquad 3.8$$

The variance equation is given as:

$$\sigma_t^2 = \omega + \beta_1 \varepsilon_{t-1}^2 + \gamma_1 \sigma_{t-1}^2 \qquad 3.9$$

Where; σ_t^2 = conditional variance of RER, ε_{t-1}^2 = past squared shocks (ARCH term), σ_{t-1}^2= past conditional variance (GARCH term).

To examine the moderating role of fiscal policy, the study employs a Smooth Transition Regression (STR) model, which allows coefficients to vary across regimes depending on the level of government expenditure. The STR specification is given as:

$$REXCV_t = \beta_0 + \beta_1 TNRR_t + \beta_2 FD_t + \beta_3 TO_t + \beta_4 INF_t + \beta_5 TNRR_t.\ G\ (GEX_t;\ \gamma, c) + \varepsilon_t \qquad 3.10$$

Here, γ = represents the speed of transition between regimes, and (c) is the threshold level of government expenditure. This formulation allows fiscal policy to moderate the effect of resource endowment

on the real exchange rate in a nonlinear and regime-dependent manner. The variables included in the model are defined as follows: real exchange rate volatility (REXCV), total natural resource rents % GDP (TNRR), fiscal deficit (FD), trade openness (TO), inflation rate (INF), and government expenditure (GEX % GDP). Trade openness captures external sector exposure, inflation reflects macroeconomic instability, while fiscal deficit and government expenditure proxy fiscal policy stance.

4.0 Results and Discussion

The descriptive statistics in Table 1 reveal important distributional characteristics with direct econometric implications for the model. The real exchange rate volatility exhibits very high dispersion, strong positive skewness, and extreme leptokurtosis, indicating the presence of large shocks, outliers, and volatility clustering in the exchange rate series. This non-normal distribution strongly justifies the use of volatility-sensitive techniques. Inflation also shows high variability and pronounced positive skewness with excess kurtosis, suggesting frequent macroeconomic instability and exposure to shocks. In contrast, total natural resource rents and trade openness display relatively moderate and stable distributions with near-symmetrical behaviour, implying more predictable movements over time. Fiscal deficit and government expenditure show mild skewness and moderate dispersion, indicating some degree of fiscal instability but not extreme volatility. The Jarque-Bera statistics confirm non-normality in key variables such as REXCV, INF, and GEX, reinforcing the presence of distributional asymmetry and validating the need for robust econometric techniques capable of handling non-normal and volatile macroeconomic data.

Table 1: Descriptive Statistics

Variables	REXCV	INF	TNRR	TO	GEX	FD
Mean	22.97314	18.70559	14.73229	36.08227	16.45102	38.73300
Median	6.190000	13.00697	15.14852	36.05867	14.84104	35.74000
Maximum	321.8400	72.83550	34.26950	52.19369	30.85716	83.53000
Minimum	-5.750000	5.388008	4.554107	20.72260	9.760705	5.280000
Std. Dev.	58.11391	15.86930	6.806948	8.479136	4.923671	19.33791
Skewness	4.229683	2.071452	0.583005	0.078576	1.167446	0.331081
Kurtosis	21.55232	6.495682	3.209201	2.440287	3.954020	2.306688
Jarque-Bera	60.63013	42.85087	2.046545	0.492881	9.277731	1.340412
Probability	0.000000	0.000000	0.359417	0.781578	0.009669	0.511603
Observations	35	35	35	35	35	35

Source: Authors' Computation, 2026.

The correlation matrix in Table 2 indicates that real exchange rate volatility is negatively associated with government expenditure, suggesting a potential stabilizing linkage between higher public spending and exchange rate movements. REXCV also shows weak negative associations with inflation and total natural resource rents, while exhibiting a weak positive association with fiscal deficit, suggesting possible pressure on exchange rate stability as fiscal imbalance increases. Inflation shows generally weak associations

with most variables, except for a moderate positive relationship with TNRR, indicating a potential linkage between resource rents and price level movements. TNRR is positively associated with GEX and moderately associated with trade openness (TO), suggesting possible linkages between resource inflows, fiscal activity, and openness of the economy. GEX is positively associated with TNRR but negatively associated with REXCV and FD, indicating potential inverse linkages between fiscal spending, exchange rate volatility, and fiscal imbalance.

Table 2: Summary of Correlation Matrix

Variables	REXCV	INF	TNRR	TO	GEX	FD
REXCV	1					
INF	-0.04572	1				
TNRR	-0.18697	0.44864	1			
TO	0.08720	-0.12715	0.42223	1		
GEX	-0.49336	0.12657	0.63018	0.44291	1	
FD	0.21549	-0.06307	-0.06255	0.06858	-0.14246	1

Source: Authors' Computation, 2026.

Table 3 shows the unit root results from both Phillips-Perron and ADF tests consistently show that all the variables real exchange rate volatility, inflation rate, total natural resource rents, fiscal deficit, trade openness and government expenditure are stationary at first difference which indicates that they are all integrated of order one I(1). Establishing stationarity is essential to avoid spurious regression results. The I(1) nature of the variables further justifies the use of ARCH modeling for volatility and STR for nonlinear dynamics.

Table 3: Results of Unit Root Tests

	Phillips-Perron test			**ADF test**		
	Level	Δ	$\boldsymbol{I(d)}$	Level	Δ	$\boldsymbol{I(d)}$
REXCV	-2.8200	-5.2793**	$I(1)$	-2.6538	-5.3099***	$I(1)$
INF	-2.4373	-4.6441***	$I(1)$	-2.1287	-4.6571**	$I(1)$
TNRR	-2.2250	-14.307***	$I(1)$	-1.0710	-7.4851***	$I(1)$
TO	-3.1856	-13.9457***	$I(1)$	-3.1856	-5.7629***	$I(1)$
GEX	-2.5915	-8.9880***	$I(1)$	-0.4820	-4.8028***	$I(1)$
FD	-3.0262	-7.5285***	$I(1)$	-2.9665	-6.1945***	$I(1)$

Source: Authors' computation, 2026.

*Note: Δ denotes the first difference operator. $I(d)$ stands for the remark for the order of integration of the unit root tests.*** *represents significance at 1% level, ** represents significance at 5% level and * represents significance at 10% level.*

Table 4 shows the Autoregressive Conditional Heteroskedasticity (ARCH) and at the mean equation, natural resource rents come out with a coefficient of -4.52 and are highly significant (z = -3.29), which tells us

that resource wealth is pulling the real exchange rate down rather than appreciating it which is the opposite of what a straightforward "resource curse" story would predict. What makes this interesting is how the fiscal variables behave alongside it. Government expenditure is also negative and significant (-3.90), moving in the same direction as TNRR, while the fiscal deficit variable shows a positive and significant relationship with exchange rate. This implies that it's not resource wealth on its own driving the exchange rate, it's how that wealth is managed fiscally. When resource revenue is channeled into spending, it appears to reinforce the depreciating effect; when it's instead associated with deficit financing, it pushes the currency the other way. So fiscal policy is actually shaping the direction and strength of the resource- real exchange rate relationship. Inflation is positive but only just squeaks past significance ($z \approx 1.98$), so there's a weak case for a price-channel effect, and trade openness, though negative, doesn't clear the significance bar ($z = -1.76$). The ARCH constant is positive but not significant, and the ARCH term itself (C8) is insignificant. The one term that stands out as genuinely significant is C9, which is at 4.05, which captures an asymmetric effect and suggest that positive and negative shocks to the resource-fiscal relationship don't hit exchange rate volatility the same way. Fiscal policy might be doing more to cushion volatility during downturns than during booms, or the reverse, depending on the government policy. The GARCH term (C10) is positive but not significant, so there no evidence of volatility clustering carrying over from one period to the next.The model explains a bit over half the variation in RER ($R^2 = 0.57$, adjusted 0.50), while the unaccounted factors are external shocks or monetary policy that aren't in this specification.

Table 4: Results of Autoregressive Conditional Heteroskedasticity

Dependent Variable: RER
Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
TNRR	-4.522337	1.387005	-3.291887	0.0010
GEX	-3.900854	2.009655	-2.098768	0.0358
FD	2.409212	0.980232	2.007711	0.0447
INF	2.541230	1.320097	1.980070	0.0503
TO	-1.986009	2.545009	-1.760089	0.0784
C	-17.05591	89.17658	-3.961120	0.0001
	Variance Equation			
C(7)	4.523428	1.064320	1.243360	0.0249
C(8)	2.542002	1.524420	1.625222	0.1041
C(9)	4.054323	1.635301	2.873009	0.0041

C(10)	1.987540	0.768987	0.760754	0.4468

R-squared	0.568002	Mean dependent var	181.2986
Adjusted R-squared	0.503676	S.D. dependent var	51.76991
S.E. of regression	32.87298	Akaike info criterion	7.298054
Sum squared resid	6532.899	Schwarz criterion	8.788813
Log likelihood	-106.9737	Hannan-Quinn criter.	8.099043
Durbin-Watson stat	1.743210		

Source: Authors' computation, 2026.

Table 5 shows the post estimation techniques and in the ARCH-LM test, the F-statistic failed to reject the null hypothesis of no remaining ARCH effects, so the volatility clustering that was present in the data has been fully absorbed by the model rather than leaking through into the residuals. The Engle-Ng sign-bias test indicates that not just whether volatility is being captured, but whether it's being captured symmetrically and the result shows that real exchange rate is not affecting volatility in different ways. The normality p-value of 0.0778 is above the 5% benchmark, so we fail to reject the null hypothesis of normality. This means the ARCH model are normally distributed, and the normality assumption underlying the model is satisfied.

Table 5: Autoregressive Conditional Heteroskedasticity Post Estimation Test

Heteroskedasticity Test: ARCH

0.000543	Prob. F(1,32)	0.7445
0.064437	Prob. Chi-Square(1)	0.6552

Engle-Ng Sign-Bias Test

	t-Statistic	Prob.
Sign-Bias	-0.365400	0.5084
Negative-Bias	-0.816520	0.5700
Positive-Bias	0.990765	0.5401
Joint-Bias	0.769961	0.6453
Normality Test	9.655918	0.0778

Source: Authors' computation, 2026.

The Table 6 shows the smooth threshold regression results, with government expenditure serving as the threshold variable and the result shows that the relationship between resource endowment and exchange rate volatility is genuinely regime-dependent rather than constant across all levels of government spending. The estimated threshold value of 0.725962 is statistically significant which confirms that government

expenditure does produce a genuine structural break in the resource-volatility relationship rather than a smooth, unchanging effect. This means the way resource endowment influences exchange rate volatility is not fixed and it depends on whether government expenditure sits below or above this critical point. When GEX is below 0.725962, the relationship follows a pattern and once it crosses that threshold, the relationship shifts to a distinctly different pattern, marking a clear regime change in how fiscal spending and resource wealth jointly shape exchange rate behaviour.

In the linear (lower) regime, GEX itself has a large, positive, and highly significant effect on 26.52 increase in REXCV, alongside trade openness, which is negative and significant with the value of -13.2. However, TNRR is positive but not significant in this regime. Once government expenditure crosses the threshold into the nonlinear regime, however, the picture changes noticeably: the GEX coefficient flips to negative and remains highly significant, effectively offsetting its lower-regime effect, while TNRR also turns negative and becomes marginally significant, and trade openness reverses sign to positive and significant. This sign reversal across regimes suggests that at low levels of government expenditure, higher fiscal spending and resource rents are associated with rising exchange rate volatility, but once government expenditure passes the threshold point, the relationship inverts, and further increases in fiscal spending and resource endowment are instead associated with dampened volatility. In other words, fiscal policy doesn't just moderate this relationship in a simple linear sense, it appears to shift its entire direction once spending reaches a critical level. The slope parameter itself is insignificant, meaning the transition between regimes is not sharply estimated, but the overall model remains statistically valid, with the F-statistic of 0.0254 confirming joint significance and an R-squared of 0.63 indicating a reasonably strong fit.

Table 6: Results of Smooth Threshold Regression
Dependent Variable: REXCV
Method: Smooth Threshold Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Threshold Variables (linear part)				
TNRR	10.87836	6.839685	1.590477	0.1274
GEX	26.51802	6.386285	4.152339	0.0005
FD	-0.369459	0.799845	-0.461913	0.6491
INF	-0.370887	1.188132	-0.312159	0.7582
TO	-13.19117	6.034522	-2.185950	0.0409
C	7.195210	174.3655	0.041265	0.9675
Threshold Variables (nonlinear part)				
TNRR	-14.21091	7.292362	-1.948739	0.0655

GEX	-26.64576	7.298898	-3.650655	0.0016
FD	0.096952	1.030107	0.094119	0.9260
INF	2.341210	1.565051	1.495932	0.1503
TO	14.68244	6.289260	2.334526	0.0301
C	-20.34302	184.8499	-0.110052	0.9135
Slopes				
SLOPE	12.47528	95.71682	0.130335	0.8976
Thresholds				
THRESHOLD	0.725962	0.761838	2.142909	0.0320

R-squared	0.630811	Mean dependent var	23.37706
Adjusted R-squared	0.390838	S.D. dependent var	58.93797
S.E. of regression	46.00038	Akaike info criterion	10.78808
Sum squared resid	42320.69	Schwarz criterion	11.41658
Log likelihood	-169.3973	Hannan-Quinn criter.	11.00241
F-statistic	2.628679	Durbin-Watson stat	2.006213
Prob(F-statistic)	0.025365		

Source: Author's computation, 2026.

The post-estimation diagnostics indicate that the model is generally well specified. The Breusch-Godfrey LM test shows high p-values, implying no evidence of serial correlation, while the Breusch-Pagan-Godfrey test confirms homoskedasticity, indicating constant variance of the residuals. However, the smooth threshold linearity tests fail to reject the null hypothesis of linearity, suggesting weak support for nonlinear dynamics. Notably, the Terasvirta test (H2) is statistically significant and it provides some evidence of nonlinearity.

Table 7: Smooth Threshold Regression Post Estimation Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.588195	Prob. F(2,18)	0.5657
Obs*R-squared	2.085756	Prob. Chi-Square(2)	0.3524

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	0.332490	Prob. F(5,28)	0.8890
Obs*R-squared	1.905552	Prob. Chi-Square(5)	0.8621
Scaled explained SS	2.127977	Prob. Chi-Square(5)	0.8312

Smooth Threshold Linearity Tests

Linearity Tests

Null Hypothesis	F-statistic	d.f.	p-value

H04: b1=b2=b3=b4=0	0.741134	(7, 21)	0.6404
H03: b1=b2=b3=0	0.741134	(7, 21)	0.6404
H02: b1=b2=0	0.741134	(7, 21)	0.6404
H01: b1=0	0.810565	(6, 22)	0.5729

Terasvirta Sequential Tests

Null Hypothesis	F-statistic	d.f.	p-value
H3: b3=0	NA	(0, 21)	NA
H2: b2=0 | b3=0	0.446833	(1, 21)	0.0111
H1: b1=0 | b2=b3=0	0.810565	(6, 22)	0.0729

Escribano-Jorda Tests

Null Hypothesis	F-statistic	d.f.	p-value
H0L: b2=b4=0	0.958433	(2, 20)	0.0004
H0E: b1=b3=0	1.125928	(6, 20)	0.0830

Source: Authors' computation, 2026.

Discussion of Findings

The finding that resource rents significantly depreciate rather than appreciate the real exchange rateis a striking departure from the Dutch Disease theory, and instead lends support to Obstfeld and Rogoff's (1995) intertemporal view where what matters isn't resource wealth itself, but how it's allocated over time. This echoes Ayinde and Bankole's (2021) finding that fiscal imbalances destabilize the naira, and Ajao and Igbekoyi's (2013) identification of government spending as a key volatility driver. The weak inflation effect and insignificant openness result mirror Oduyemi et al.'s (2024) mixed findings on Nigeria's oil-exchange rate linkages. Meanwhile, the significant asymmetric shock term, paired with an insignificant GARCH persistence term are in consistent with Kouladoum et al.'s (2026) dual stabilizing-then-destabilizing effect of resource rents and Zhan et al.'s (2021) regime-dependent resource curse evidence. These results reframe the resource curse debate that it is not resources that curse an economy, but careless fiscal stewardship which resonates strongly with Amare *et al.* (2024) and reinforces a growing consensus that exchange rate volatility in resource-rich economies is ultimately a governance problem wearing a resource-endowment mask.

Similarly, the smooth threshold regression results deliver perhaps the most compelling evidence yet that fiscal policy doesn't just moderate the resource-volatility relationship at the margins, it fundamentally rewires it once government expenditure crosses a critical threshold of 0.725962. Below this line, the story looks like a cautionary tale straight out of Dutch Disease theory: government expenditure drives exchange rate volatility sharply upward, and while resource rents are not yet statistically significant, the overall regime reflects the kind of undisciplined, procyclical spending that Amare et al. (2024) said it increases

resource-driven instability. But cross that threshold, and the entire relationship inverts as GEX flips to a significant negative effect, resource rents turn negative and marginally significant, and trade openness reverses sign entirely, suggesting that once fiscal spending reaches a critical mass, it starts absorbing shocks rather than amplifying them. This regime-switching behaviour offers an empirical bridge between Obstfeld and Rogoff's (1995) intertemporal framework, where the exchange rate consequences of resource income hinge on the intertemporal allocation of spending, and Kouladoum et al.'s (2026) dual finding that resource rents initially stabilize before eventually destabilizing African economies. It also lends fresh texture to Zhan et al.'s (2021) argument that policy regimes shape resource curse outcomes: rather than a uniform curse or blessing, the results reveal a genuine tipping point where fiscal discipline transforms from part of the problem into part of the solution.

5.0 Conclusion and Recommendations

This study examined the moderating role of fiscal policy in the relationship between resource endowment and real exchange rate volatility, and the evidence points to one clear conclusion: fiscal policy is not a passive bystander but an active force that shapes both the direction and magnitude of this relationship. The ARCH results show that natural resource rents significantly depreciate rather than appreciate the real exchange rate, and that this effect is reinforced or reversed depending on whether resource revenue is channeled into government expenditure or financed through fiscal deficits, while the asymmetric volatility term confirms that fiscal policy cushions positive and negative shocks unevenly. The smooth threshold regression results deepen this conclusion by demonstrating that the relationship is not merely moderated at the margins but fundamentally regime-dependent: below the threshold value of 0.725962, higher spending and resource rents are associated with rising exchange rate volatility, but once expenditure crosses this critical point, the relationship inverts, and further fiscal spending and resource endowment instead dampen volatility. These findings establish that the resource endowment-exchange rate volatility relationship in Nigeria is neither fixed nor automatic; it is conditional on the scale and management of government expenditure, with a definitive tipping point beyond which fiscal policy shifts from amplifying instability to containing it.

Given that government expenditure was found to reinforce the depreciating effect of resource rents at low spending levels but dampen exchange rate volatility once a critical threshold is crossed, fiscal authorities should prioritize scaling government expenditure deliberately past this threshold rather than maintaining spending at suboptimal levels that leave the economy exposed to heightened volatility. Since fiscal deficit financing was shown to move the exchange rate in the opposite direction from expenditure-financed resource spending, policymakers should favour channeling resource revenue directly into productive expenditure over deficit financing, as the latter appears to undermine the stabilizing potential that expenditure-driven spending can eventually deliver. Given the significant asymmetric volatility effect identified in the ARCH results, fiscal

and monetary authorities should design countercyclical buffers capable of responding differently to positive and negative resource-fiscal shocks, rather than applying uniform stabilization measures that assume symmetric shock transmission. Lastly, because trade openness reversed from an insignificant negative effect to a significant positive effect once the government expenditure threshold was crossed, trade policy should be coordinated with fiscal expenditure planning, ensuring that openness-related reforms are timed to complement, rather than counteract, the stabilizing regime that emerges once government expenditure surpasses its critical threshold.

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