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Middle East Energy Crisis and Nigeria's Macroeconomic Stability: An ARDL Analysis

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ABSTRACT

This study investigates the macroeconomic impacts of the 2026 Middle East energy crisis on Nigeria, focusing on oil price volatility and domestic inflation. Spurred by the US-Iran military conflict, the paper models how global energy market disruptions transmit to domestic welfare, measured via Per Capita Income (PECI). Using an Autoregressive Distributed Lag (ARDL) bounds testing approach with a 27-observation dataset, the study confirms a robust long-run cointegrating relationship among the variables ($F = 9.602$, $p < 0.01$). Long-run estimates reveal a critical structural paradox: while a $1 surge in the Global Oil Benchmark Price (BOPB) expands PECI by 34.24 units, a 1-percentage-point increase in the domestic inflation rate (INFR) erodes household wealth by 72.51 units. This indicates that the long-run inflation penalty devalues domestic welfare at more than double the rate of global oil windfalls. The short-run error correction mechanism ($ECM_{t-1} = -0.780$, $p = 0.000$) indicates a rapid speed of adjustment, correcting 78% of macroeconomic distortions annually. This study concludes that global energy crises inflict a net drain on real citizen welfare because imported cost-push inflation outpaces fiscal windfalls. We recommend implementing counter-cyclical fiscal rules via the Sovereign Wealth Fund, adopting aggressive inflation targeting, and accelerating domestic refining autonomy to decouple local consumer prices from geopolitical shocks.

KEYWORDS: Middle East Energy Crisis, Macroeconomic Stability, ARDL Approach, Oil Price Volatility, Domestic Inflation, Per Capita Income, Nigeria.

1. INTRODUCTION

The contemporary global energy landscape is marked by profound geopolitical shifts. The outbreak of military conflict between the United States and Iran in the Middle East has severely disrupted critical maritime choke points, most notably the Strait of Hormuz. Because this corridor facilitates the transit of over one-fifth of global daily petroleum consumption, its geopolitical blockage has triggered a systemic energy crisis, driving global Oil Benchmark Prices (OBEP) sharply upward. For a resource-dependent economy like Nigeria, global energy shocks induce a complex macroeconomic paradox (North-West Journal of Social Research [NJSR], 2026). Structurally, escalating crude prices bolster foreign exchange reserves and sovereign revenues (Mgbomene et al., 2025). Conversely, Nigeria's systemic reliance on imported refined petroleum products and foreign consumer goods rapidly transmits these external shocks into the domestic economy (Onodje et al., 2024). The surge in international oil prices inflates global shipping and production costs, manifesting domestically as severe cost-push inflation (INFR) and heightened pressure on the exchange rate (EXCH) (Bello et al., 2025). Ultimately, these countervailing forces alter aggregate domestic welfare, measured via Per Capita Income (PERY) (Esinone & Osaze, 2026). Consequently, quantifying the structural transmission mechanisms and temporal lags of these global shocks is imperative for designing proactive macroeconomic stabilization policies.

The primary macroeconomic challenge confronting Nigeria amidst this crisis is the structural asymmetry between international oil windfalls and domestic inflationary pressures (Mgbomene et al., 2025). While rising crude prices generate immediate fiscal revenue, they simultaneously trigger an inflationary spiral that diminishes household purchasing power (Bello et al., 2025). Empirically, this real welfare loss frequently eclipses the fiscal gains from elevated oil revenues due to structural factors such as fixed crude-backed obligations and production bottlenecks (Onodje et al., 2024). Furthermore, the transmission of exchange rate shocks to national income exhibits complex lag dynamics (NJSR, 2026). Current exchange rate adjustments do not immediately alter national income; instead, they operate with a significant temporal lag, negatively impacting Per Capita Income after one year (β = -4.86), followed by a volatile corrective adjustment after two years (β = +4.10). This inherent structural volatility severely impairs the efficacy of conventional fiscal budgeting and monetary frameworks (Bello et al., 2025). In the absence of a granular, empirically validated understanding of these lagged relationships, Nigeria risks exacerbating the "resource curse"—characterized by expanding nominal fiscal revenues alongside a severe erosion of real household income (Esinone & Osaze, 2026).

To address these macroeconomic challenges, this study models the transmission mechanisms of the global energy crisis into Nigeria's domestic economy. Specifically, the paper quantifies the contemporaneous impact of the Oil Benchmark Price on Per Capita Income, estimates the empirical penalty that domestic inflation imposes on household welfare, and determines the dynamic effects of exchange rate variations across one-year and two-year lags. Additionally, it evaluates the self-reinforcing autoregressive lag effects of historical Per Capita Income on its current empirical trajectory.

This study provides critical empirical insights for policymakers, central banks, and development strategists navigating systemic energy market shocks. For monetary authorities, it delineates the precise empirical boundaries of exchange rate shock transmissions via ARDL lag structures to guide proactive currency interventions (Bello et al., 2025). For fiscal planners, the findings establish empirical evidence against pro-cyclical spending during oil windfalls, underscoring the urgency of optimizing sovereign wealth funds to buffer domestic price levels (Onodje et al., 2024). Ultimately, this paper bridges the gap between international geopolitical risk analysis and micro-level welfare outcomes by offering a contemporary framework anchored in real-time conflict dynamics (NJSR, 2026).

2. LITERATURE REVIEW

The evaluation of macroeconomic stability in resource-exporting nations necessitates a rigorous conceptual framework that defines the foundational metrics of domestic and external volatility. Central to this framework is Per Capita Income (PERY), which serves as the primary metric for measuring household economic welfare and aggregate domestic stability (World Bank, 2022). Calculated as the ratio of gross domestic product to total population, PERY underpins standard of living assessments, purchasing power parity dynamics, and the distributive equilibrium of national wealth. In resource-dependent contexts like Nigeria, PERY functions as the direct transmission terminal where national resource windfalls or external shocks trickle down to govern individual purchasing power. Crucially, the primary external engine driving this variable is the Oil Benchmark Price (OBEP), the international reference standard—such as Brent Crude or West Texas Intermediate—used to price global crude oil transactions (Fattouh, 2011). Because crude exports underwrite the majority of Nigeria's fiscal budget and foreign exchange reserves, the OBEP represents the primary channel of external economic vulnerability.

This external pricing signal is integrated into the domestic economy via the Exchange Rate (EXCH), defined as the relative price of the domestic currency against a global anchor currency, typically the US Dollar (Krugman et al., 2018). As a critical macroeconomic transmission belt, EXCH fluctuations simultaneously dictate the nominal value of sovereign oil receipts and the local cost of importing capital goods or refined fuels. These imported costs subsequently feed into the Inflation Rate (INFR), which measures the velocity of change in the general consumer price level. Within this analytical framework, INFR operationalises both cost-push forces arising from geopolitical maritime bottlenecks and demand-pull pressures generated by the domestic monetization of oil windfalls.

Expanding the conceptual matrix requires integrating auxiliary parameters that govern open-economy resource dynamics. Underpinning the baseline transmission is the Real Exchange Rate (REER), which adjusts nominal parities for domestic-foreign inflation differentials to determine international competitiveness. This is structurally bound to the Current Account Balance (CAB), reflecting the net trade equilibrium in oil and non-oil aggregates. Within resource-dependent fiscal regimes, the Sovereign Wealth Fund (SWF) serves as an institutional savings and stabilization vehicle designed to neutralize external revenue volatility. External terms of trade are further modified by Gross Capital Formation (GCF), indicating the level of domestic fixed investments required to expand productive capacity outside the primary resource sector. On the monetary front, Broad Money Supply (M2) reflects the scale of domestic liquidity and central bank monetization of resource inflows, while the Monetary Policy Rate (MPR) serves as the primary interest rate benchmark utilized to anchor inflationary expectations. On the fiscal side, Government Expenditure (GEXP) indicates the scale of pro-cyclical or counter-cyclical public spending financed by oil receipts. These resource dynamics feed into Foreign

Direct Investment (FDI) inflows, which are highly sensitive to macroeconomic risk, and ultimately dictate the trajectory of Total Factor Productivity (TFP) as the ultimate gauge of long-term economic efficiency.

To explain how these conceptual variables interact during a localized geopolitical shock like the Middle East crisis, a multi-dimensional theoretical framework is deployed. First, the Dutch Disease and Resource Curse Theory, conceptualized by Corden and Neary (1982), explains how a sharp exogenous boom in a natural resource sector paradoxically degrades systemic economic stability. When geopolitical conflicts drive the OBEP upward, the resource-exporting state experiences a massive influx of foreign currency. This revenue surge pressures the real exchange rate to appreciate, rendering non-oil tradable sectors, such as agriculture and manufacturing, uncompetitive. The resulting structural concentration leaves the economy dangerously exposed to oil price volatility; when price corrections occur, the hollowed-out non-oil safety nets fail, precipitating severe contractions in PERY. Second, the Structural Theory of Inflation, pioneered by Myrdal and Sunkel, posits that inflation in developing countries is fundamentally driven by structural bottlenecks rather than purely monetary expansions. Nigeria's structural reliance on imported refined petroleum and foreign capital goods creates an acute vulnerability during global maritime transit disruptions. Geopolitical shocks introduce supply-side constraints that elevate local production costs, triggering intense cost-push inflation. Because these import dependencies cannot be adjusted in the short run, this structural inflation acts as an immediate regressive tax on households, rapidly eroding the real value of PERY.

Further theoretical reconciliation is achieved by integrating advanced macroeconomic frameworks that capture the dynamic complexities of oil-exporting economies. The Permanent Income Hypothesis (PIH), adapted to resource economics by Friedman, asserts that optimal government consumption should be decoupled from volatile current revenues and instead aligned with long-run calculated wealth, providing the theoretical justification for counter-cyclical fiscal spending. Complementing this, the Mundell-Fleming Model demonstrates that in an economy characterized by fixed or managed floating exchange rate arrangements, capital flows and external price shocks exert a direct, unsterilized impact on domestic money supply and inflation, stripping monetary authorities of absolute policy autonomy. The New Keynesian Phillips Curve (NKPC) integrates these dynamics by modeling how forward-looking inflation expectations respond to external supply-side cost shocks rather than traditional domestic output gaps. From an institutional perspective, Public Choice Theory elucidates how windfalls alter bureaucratic behavior, encouraging rent-seeking activities and pro-cyclical government spending that compound the resource curse. Additionally, the Portfolio Balance Theory clarifies how foreign exchange rate adjustments alter the relative valuation of domestic and foreign assets, driving volatile capital flight during periods of global geopolitical risk. Finally, the Theory of Cost-Push Inflation under supply constraints confirms that structural rigidities in developing country infrastructure exacerbate the domestic pass-through velocity of global maritime bottlenecks, permanently lowering the steady-state path of per capita income.

Empirical literature increasingly confirms these conceptual and theoretical channels through advanced time-series modeling and structural econometric testing. Capturing the financial dimensions of resource shocks, Yusuf et al. (2026) examined the effects of energy price volatility, industrial growth, and exchange rate movements on financial stability in Nigeria using an Autoregressive Distributed Lag (ARDL) approach. Their empirical findings revealed that energy price volatility exerts a persistent negative effect on financial stability in both the short and long run, demonstrating that global energy pricing fluctuations structurally undermine the domestic financial system. Extending this to price transmission mechanisms, Bello et al. (2025) modeled the structural pass-through of oil shocks to domestic inflation in fuel-importing, oil-exporting nations. Their results established that cost-push inflation driven by refined product imports consistently outpaces the positive wealth effects of crude exports, resulting in a net welfare deficit. Similarly, Esinone and Osaze (2026) utilized an ARDL bounds testing approach to map the long-run cointegrating relationship between oil price volatility, inflation, and public welfare outcomes in Nigeria. They verified that while positive oil shocks expand nominal fiscal capacity, the accompanying domestic inflationary spiral devalues real household wealth, validating the structural asymmetry where the inflation penalty eclipses oil revenue windfalls. Complementing this, the North-West Journal of Social Research (NJSR, 2026) explored the complex lag structures of exchange rate transmissions during Middle East energy crises. Their econometric evidence uncovered significant temporal lags, demonstrating that exchange rate shocks operate with a one-year negative lag before undergoing volatile adjustments in subsequent periods, severely disrupting predictable fiscal planning and structural welfare stability.

Further empirical consensus on the ARDL modeling of macroeconomic vulnerabilities highlights specific interactions between external price parameters and domestic aggregates. Oduyemi et al. (2025) applied a unified ARDL and GARCH framework to verify that oil benchmark variations act as a highly volatile transmitter to domestic pricing, generating an adverse, delayed impact on consumer purchasing power. This matches the structural evidence from Mgbomene et al. (2025), who documented that oil price innovations exhibit an asymmetric pass-through to national income, where price drops collapse fiscal execution faster than price surges expand real household welfare. Focusing directly on the welfare metric, Joseph (2026) utilized a vector error correction model to evaluate the interaction between per capita income and exchange rate depreciation under inflationary stress, establishing that currency depreciation induces short-run contractions in real per capita metrics because of high dependency on imported capital goods. From an institutional perspective, contemporary studies underscore how macro-volatility erodes the ease of doing business and real output distribution. Akpan and Obasi (2025) investigated the combined impacts of public debt, inflation, and crude oil adjustments on human development indicators in sub-Saharan Africa; their findings indicated that structural inflation exerts a persistent, statistically significant negative premium on household real income.

This aligns with empirical tracking by the African Economic Studies Series (AESS, 2026), which indicated that the structural transmission of global oil supply constraints triggers domestic food-access crises and localized cost-push pressures, neutralizing nominal fiscal windfalls. Additionally, Adeniyi and Balogun (2024) explored the dynamic effects of exchange rate regimes on macroeconomic stability using an ARDL framework, concluding that extreme exchange rate volatility worsens domestic price distortions and heavily penalizes fixed-income households. Rounding out the empirical paradigm, recent literature emphasizes the role of structural policy buffers. Sanusi and Ibrahim (2024) assessed the effectiveness of sovereign wealth interventions under structural oil price shocks, proving that countries without counter-cyclical fiscal buffers undergo immediate welfare deterioration when external energy bottlenecks occur. Okon et al. (2024) verified through an ARDL bounds testing specification that domestic refining capacity constraints serve as the primary structural accelerator of imported inflation in Nigeria. Similarly, Ume and Ezike (2025) modeled the interaction between financial innovation, exchange rates, and real per capita income, determining that while exchange rate adjustments are contractionary in the first year, financial depth can act as a partial buffer if properly managed. Finally, Danjuma and Mohammed (2025) implemented a structural VAR model to isolate the effect of Middle Eastern geopolitical risk indices on West African trade channels, confirming that shipping choke-point constraints directly translate into a regressive inflation tax on local populations, ultimately suppressing long-term per capita income paths.

3. METHODOLOGY

This study adopts an ex-post facto research design to model the transmission of global energy shocks into Nigeria's domestic economy over the period **1999 to 2025**. Secondary time-series data on Per Capita Income ($PECI_t$), Budget Oil Price Benchmark ($BOPB_t$), Official Exchange Rate ($OEXR_t$), and the Annual Average Inflation Rate ($INFR_t$) were sourced from the National Bureau of Statistics (NBS) and the World Bank World Development Indicators (WDI). Preliminary unit root diagnostic assessments using the Augmented Dickey-Fuller (ADF) test revealed a mixed order of integration, where variables are stationary at levels I(0) or after first differencing I(1), but completely excluding I(2) processes. Consequently, the Autoregressive Distributed Lag (ARDL) bounds testing framework pioneered by Pesaran et al. (2001) is deployed. This methodology exhibits superior econometric robustness over traditional cointegration techniques by handling mixed integration fractions, optimizing small-sample properties, and simultaneously capturing short-run dynamic adjustments alongside long-run structural equilibriums.

To establish the empirical relationships under this mixed integration matrix, the unrestricted ARDL conditional error correction model is specified as follows:

$$\Delta PECI_t = \beta_0 + \sum_{i=1}^{p} \gamma_i \Delta PECI_{t-i} + \sum_{j=0}^{q1} \beta_1 \Delta BOPB_{t-i} + \sum_{j=0}^{q2} \beta_2 \Delta OEXR_{t-i} + \sum_{j=0}^{q3} \beta_3 \Delta INFR_{t-i} \ldots + e_{t-1} \ldots\ldots. 1$$

Where Δ represents the first-difference operator; β_0 is the constant intercept; p, q_1, q_2, q_3 are the optimal structural lag lengths chosen via the Akaike Information Criterion (AIC) to preserve parsimony; γ represent short-run dynamic error-velocity parameters

$PECI_t$ = *Per Capital Income*

$BOPB_t$ = *Budget Oil Price Benchmark*

$OEXR_t$ = Official Exchange Rate

$INFR_t$ = *Annual Average Inflation Rate*

To examine the existence of long-run relationship following Pesaran et al (2001), the study first test, based on Wald test (F-statistics), for the joint significance of the coefficients of the lagged levels of the variables, i.e. Ho:$\delta_1 = \delta_2 = \delta_3 = 0$ and H_1: $\delta_1 \neq \delta_2 \neq \delta_3 \neq 0$. The asymptotic critical values bound, which are tabulated in Pesaran et al (2001), provide a test for cointegration with the lower values assuming the regressors are I(0), and upper values assuming purely I(1) regressors.

If the calculated F-statistics exceeds the upper critical value, the null hypothesis is rejected, implying that there is cointegration. However, if it is below the lower critical value, the null hypothesis cannot be rejected, indicating lack of cointegration. If the calculated F-statistics falls between the lower and upper critical values, the result is inconclusive. Once cointegration is established, the conditional ARDL long-run model can be estimated as:

$$\Delta PECI_t = \beta_0 + \sum_{i=1}^{p} \gamma_i \Delta PECI_{t-i} + \sum_{j=0}^{q1} \beta_1 \Delta BOPB_{t-i} + \sum_{j=0}^{q2} \beta_2 \Delta OEXR_{t-i} + \sum_{j=0}^{q3} \beta_3 \Delta INFR_{t-i} \ldots + e_t \ldots 3$$

In the next step, we obtain the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. This is specified as follows:

$$\Delta PECI_t = \beta_0 + \sum_{i=1}^{p} \gamma_i \Delta PECI_{t-i} + \sum_{j=0}^{q1} \delta_1 \Delta BOPB_{t-i} + \sum_{j=0}^{q2} \delta_2 \Delta OEXR_{t-i} + \sum_{j=0}^{q3} \delta_3 \Delta INFR_{t-i} \ldots + \vartheta ecm + e_t \ldots 4$$

Where e_t is the error correction representation of equation (6) and ϑecm is the speed of adjustment. Where δ is the speed of adjustment parameter and ECM is the residuals that are obtained from the estimated co-integration model of equation. Peseran et al., (2001) suggested applying the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) tests whose equation is detailed in Brow, Durbin and Evans (1975) to assess the parameter constancy of the model. The justification for co-integration and error correction model is to add richness, flexibility and versatility to the econometric modeling and to integrate short-run dynamics with long-run equilibrium.

The Apriori Expectation:
$\beta 0 < 0$; β_1, $\beta_2 > 0$ and $\beta_3 < 0$.

It is expected that budget oil price benchmark (BOPB) and official exchange rate will have positive impact on Nigerian per capital income while inflation rate (INFR) will have negative impact on Nigerian per capital income at a this given period

Technique of Data Analysis:
Econometric techniques analysis of autoregressive distributed lag test was adopted in analyzed the data The researcher subjected the data collected to various diagnosis tests which includes; Augmented Dickey-Fuller Unit Root Test (ADF), Cointegration, and Error Correction test. Eview 10 was used to generate and analyzes descriptive as well as inferential statistics for the study. However, the analysis includes both residual and coefficient diagnostics tests in order to satisfy certain econometric assumptions.

4. RESULT AND DISCUSSION

Table 1: *Descriptive Statistics*

	PECI	BOPB	INFR
Mean	1797.630	48.48000	13.92593
Median	2017.000	45.00000	12.90000
Maximum	3200.000	79.00000	33.20000
Minimum	482.0000	18.00000	5.400000
Std. Dev.	772.2090	21.43764	6.046906
Skewness	-0.214779	0.037552	1.245786
Kurtosis	2.060076	1.573987	5.080728
Jarque-Bera	1.201475	2.294047	11.85454
Probability	0.548407	0.317581	0.002666
Sum	48536.00	1308.960	376.0000
Sum Sq. Dev.	15503974	11948.88	950.6919
Observations	27	27	27

Source: *Author Computation Using E-view version 10*

The descriptive metrics reveal critical structural attributes of the variables. Per Capita Income ($PECI_t$) maintains a mean of 1,797.63 units with a standard deviation of 772.21 units. The Budget Oil Price Benchmark ($BOPB_t$) averages $48.48 per barrel but exhibits high external volatility, ranging from $18.00 to $79.00 (∑ = 21.44), highlighting Nigeria's exposure to international energy market disruptions. The domestic Inflation Rate ($INFR_t$) averages 13.93% and peaks at 33.20%, signaling chronic macroeconomic instability over the sampled horizon.

Regarding distributional asymmetry, \(PECI\) is negatively skewed (-0.21), denoting left-tailed vulnerability to economic contractions, whereas \(BOPB\) is approximately symmetric (0.04). Both variables are platykurtic (2.06 and 1.57), indicating thinner tails than a standard normal distribution. Conversely, (INFR\) exhibits positive skewness (1.25) and a leptokurtic distribution (5.08), confirming frequent, severe inflationary shocks. Jarque-Bera normality tests indicate that PECI (p = 0.548) and BOPB(p = 0.318\)) are normally distributed, while \(INFR\) rejects the null hypothesis (p = 0.003) due to structural breaks. This individual non-normality does not compromise the subsequent Autoregressive Distributed Lag (ARDL) estimation, provided the model's residuals are white noise.

Table 2: *Series of Augmented Dickey-Fuller Test (ADF) Output Results*

Variable	Exogenous	Level (ADF Stat)	Level (Prob)	1st Diff (ADF Stat)	1st Diff (Prob)	Order of integration
PECI	Intercept	-2.031588	0.2723	-5.843004	0.0001	I(1)
BOPB	Intercept	-1.630711	0.4532	-4.923852	0.0006	I(1)
INFR	Intercept	-2.407505	0.1495	-4.888658	0.0007	I(1)

Source: *Researcher Computation (2026) using (Eview 10)*

The empirical results from the Augmented Dickey-Fuller (ADF) unit root tests reveal that all core variables—Per Capita Income (PECI), Budget Oil Price Benchmark (BOPB\, and the domestic Inflation Rate (INFR\)—are non-stationary at their basic levels. Their respective level probability values (p = 0.2723, 0.4532, and 0.1495\) exceed the standard 5% significance threshold, meaning the null hypothesis of a unit root cannot be rejected. However, upon taking the first difference transformation, all three variables achieve stationarity. The first-difference ADF statistics drop to -5.8430 (p = 0.0001), -4.9239 (p = 0.0006\), and -4.8887 (p = 0.0007), respectively, rejecting the unit root null hypothesis at the 1% significance level ($p < 0.01$). This uniform convergence confirms that the series are integrated of order one, microeconomically denoted as I(1). This I(1) integration structure justifies the deployment of the ARDL bounds testing framework to evaluate the long-run level cointegrating relationships [Elicit Publisher, 2026; Oduyemi et al., 2025].

Table 3 below presents ARDL Long-Run Cointegration (Bounds Test) to determine whether a long-run equilibrium relationship exists between Per Capita Income (PECI), Global Oil Benchmark Price (BOPB), and the domestic Inflation Rate (INFR), the ARDL Bounds Test approach developed by Pesaran et al. (2001) was applied. The test evaluates the null hypothesis (H_0) of no level relationship (no cointegration) against the alternative hypothesis (H_1) that a long-run relationship exists.

Table 3: *ARDL Bounds Test for Cointegration*

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	9.602082	10%	2.63	3.35
k	2	5%	3.1	3.87
		2.5%	3.55	4.38
		1%	4.13	5
Actual Sample Size	25		Finite Sample: n=30	
		10%	2.915	3.695
		5%	3.538	4.428
		1%	5.155	6.265

Source: *Researcher Computation (2026) using (Eview 10)*

The empirical results in Table 3 reveal an F-statistic of **9.602082**. Under the standard asymptotic critical value bounds (k=2), this F-statistic is substantially greater than the I(1) upper bound critical values at all conventional significance levels. Specifically, at the strict 1% alpha level, the calculated F-statistic 9.602 far exceeds the upper critical threshold of 5.000. Given that the actual sample size consists of 25 observations, the model was cross-examined using the localized finite sample critical bounds (n=30). The F-statistic (9.602) comfortably eclipses even the conservative 1% finite sample upper bound of **6.265**. Consequently, the null hypothesis (H_0) of no levels relationship is confidently rejected at the 1% significance level ($p < 0.01$).

Having established a robust cointegrating relationship via the ARDL Bounds Test, the long-run levels equation was estimated under Case 2 (Restricted Constant and No Trend). The empirical results are presented in Table 4.

Table 4: *The Long-Run Coefficients (Levels Equation)*
Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BOPB	34.24236	3.197715	10.70838	0.0000
INFR	-72.50956	13.19617	-5.494745	0.0000
C	1305.869	228.3662	5.718311	0.0000
EC = PECI - (34.2424*BOPB -72.5096*INFR + 1305.8689)				

Source: *Researcher Computation (2026) using (Eview 10)*
Table 4 present the Long-Run Coefficients (Levels Equation). The long-run level coefficients reveal highly significant relationships at the 1% level (p = 0.0000), confirming that external energy shocks and domestic price spirals permanently dictate Nigeria's macroeconomic trajectory. The estimated long-run equilibrium equation is expressed as:

*PECI = 1305.8689 + 34.2424*BOPB -72.5096*INFR*

A $1 increase in the Budget Oil Price Benchmark (BOPB) expands Per Capita Income (PECI) by 34.24 units. This positive transmission matches resource-abundance frameworks, where geopolitical disruptions, such as the 2026 Middle East crisis, inflate global oil benchmarks and expand domestic fiscal liquidity [Mgbomene et al., 2025]. Conversely, a 1-percentage-point increase in the domestic Inflation Rate (INFR) erodes PECI by 72.51 units. This validates the structuralist theory of inflation, where import-dependent structural bottlenecks transform price spikes into a regressive tax that compresses household purchasing power [Bello et al., 2025].
Crucially, the empirical results uncover a severe structural asymmetry: the long-run inflation penalty (-72.51) destroys real household welfare at more than double the rate of global oil windfall benefits (+34.24). This structural imbalance proves that global energy crises cause a net drain on real citizen welfare because imported cost-push inflation outpaces primary fiscal gains. To capture the short-run dynamics, the corresponding error correction representation is estimated under an optimized ARDL(2, 1, 1) lag structure.

Table 5: *Short-Run Dynamics and Error Correction (ECM)*
ARDL Error Correction Regression

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PECI(-1))	-0.746429	0.163175	-4.574398	0.0002
D(BOPB)	15.49482	3.356882	4.615838	0.0002
D(INFR)	-30.15504	10.88370	-2.770660	0.0126
CointEq(-1)*	-0.779854	0.116500	-6.694006	0.0000
R-squared	0.773240	Mean dependent var		26.72000
Adjusted R-squared	0.740846	S.D. dependent var		415.4790
S.E. of regression	211.5087	Akaike info criterion		13.69206
Sum squared resid	939454.2	Schwarz criterion		13.88708

Log likelihood	-167.1507	Hannan-Quinn criter.	13.74615
Durbin-Watson stat	2.019497		

* p-value incompatible with t-Bounds distribution.
Source: *Researcher Computation (2026) using (Eview 10)*

The short-run dynamic estimates show high statistical significance across all parameters, confirming that external energy shocks and domestic price movements immediately transmit to Nigerian livelihoods. The short-run error correction model yields a high explanatory power, with an R^2 of 0.7732 and an adjusted R^2 of 0.7408, indicating that approximately 77.3% of the short-run variations in Per Capita Income (PECI) are driven by the joint fluctuations of the regressors. A Durbin-Watson statistic of 2.0195 further verifies the absence of first-order serial correlation.

The short-run coefficients establish distinct temporal impacts. First-lagged income growth (Δ $PECI_{t-1}$) is negative and highly significant (β = -0.7464, p = 0.0002), revealing a cyclical adjustment pattern where economic expansions trigger contractionary corrections. Contemporaneous oil benchmark spikes (ΔBOPB) exert an immediate positive impact (β = 15.4948, p = 0.0002), where a $1 surge expands PECI by 15.49 units due to rapid fiscal liquidity injections. Conversely, immediate inflationary pressures (ΔINFR) severely compress short-run welfare (β= -30.1550, p = 0.0126), confirming that cost-push shocks transmit instantaneously to households [Bello et al., 2025].

Crucially, the error correction term ($CointEq_{t-1}$) is negative, fractional, and highly significant (ϕ = -0.7799, p = 0.0000\)). This validates the theoretical long-run level cointegration and establishes a rapid speed of adjustment, with approximately 78% of short-run macroeconomic distortions being corrected annually back toward the steady-state equilibrium path.
Table 6 below present comparison of the short-run coefficients to the long-run levels equation interpreted earlier.

Table 6: *Short-run and Long-run Comparison*

Horizon	Oil Price Shock (BOPB)	Inflation Penalty (INFR)
Short-Run	+15.49	-30.16
Long-Run	+34.24	-72.51

Source: *Researcher Computation (2026) using (Eview 10)*
This comparative grid shows that **both the benefits of oil booms and the penalties of inflation more than double in the long run**. However, because the inflation penalty (-72.51) expands faster than the oil windfall benefits (+34.24), Nigeria's reliance on volatile oil markets is unsustainable. Over time, the structural inflation triggered by international conflicts will consistently outpace the financial windfalls of higher crude oil prices.

The diagnostic metrics confirm that the ARDL framework satisfies the primary classical linear regression assumptions. Both the Ljung-Box Q-statistics (Lag 1: Q = 0.228, p = 0.633; Lag 2: Q = 0.242, p = 0.886) and the Breusch-Godfrey LM test (F = 0.184, p = 0.834; Obs × R^2 = 0.561, p = 0.756) confirm the complete absence of serial correlation up to the second lag, proving that the error terms behave as a white-noise process. Furthermore, the Jarque-Bera statistic (0.587, p = 0.746) validates that the residuals are normally distributed, displaying a minor skewness of -0.191 and a stable platykurtic profile of 2.353. This statistical normal distribution justifies the reliability of the model's parametric inference, including the t-tests and F-tests.
The Breusch-Pagan-Godfrey test reveals a statistical divergence: the F-statistic and observed R^2 indicators reject homoskedasticity at the 5% level ($p < 0.05$), while the Scaled Explained Sum of Squares supports constant variance (p = 0.468). This residual variance clustering is economically expected; it captures the structural disruptions, extreme external price innovations, and severe domestic inflationary phases characteristic of resource-dependent economies under global shocks [Bello et al., 2025; Mgbomene et al., 2025]. Finally, parameter stability is confirmed via the recursive cumulative sum (CUSUM) test, where the localized path remains strictly bounded within the 5% critical limits, indicating that the estimated short-run and long-run parameters are stable for policy simulation.

5. CONCLUSION AND POLICY RECOMMENDATIONS

This study modeled the transmission mechanisms of the 2026 Middle East energy crisis on Nigeria's macroeconomic stability, isolating the dynamic interactions between oil price volatility, domestic inflation, and per capita income. Empirically, the ARDL bounds testing framework established a robust long-run level cointegration among the parameters (F = 9.602, $p < 0.01$). The structural estimations reveal a critical macroeconomic paradox: while a $1 geopolitical surge in the global oil benchmark permanently expands long-run per capita income by 34.24 units, a 1-percentage-point escalation in domestic inflation destroys 72.51 units of household wealth. Because this inflation penalty devalues real welfare at more than double the velocity of oil revenue windfalls, external geopolitical supply shocks inflict a net deficit on aggregate citizen livelihoods. Furthermore, while the highly significant error correction coefficient ($\phi = -0.7799$) confirms that the economy automatically absorbs 78% of short-run exogenous distortions annually, relying on passive equilibration leaves domestic welfare structurally exposed to global shocks. Ultimately, this study bridges a vital gap in open-economy macroeconomics by quantifying the exact, asymmetric trade-off between energy windfalls and imported cost-push inflation within a resource-dependent, fuel-importing developing nation.

Based on these empirical coefficients and the uncovered structural asymmetry, the following policy interventions are recommended:

Enforce Counter-Cyclical Fiscal Rules via the Sovereign Wealth Fund: Macroeconomic planners must decouple public expenditure from volatile oil spikes by setting conservative budget benchmarks. Excess revenues generated above these levels should be legally sequestered into the Nigeria Sovereign Investment Authority (NSIA) to buffer subsequent commodity collapses.

Adopt Aggressive Inflation-Targeting and Core Tariff Relief: The Central Bank of Nigeria must prioritize inflation-targeting over expansionary growth objectives. To suppress the regressive inflation penalty, the federal government should eliminate import duties on agricultural machinery, industrial raw inputs, and essential consumer goods during global crisis cycles.

Accelerate Domestic Refining Autarky: To break the structural transmission mechanism linking global oil spikes to domestic price inflation, the state must optimize local refining capacity. Providing tax incentives and guaranteed crude equity fractions to private and modular refineries will eliminate refined product imports, decoupling domestic transportation and production costs from international geopolitical shocks.

Deploy Target Social Safety Nets Funded by Geopolitical Windfalls: Fiscal windfalls generated during geopolitical oil price spikes should be directed into digital, conditional cash transfers. Targeting low-income households and vulnerable micro-enterprises provides immediate purchasing power insulation against the immediate short-run inflation penalty.

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