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Oil Price Volatility, Economic Growth and Financial Stability in Nigeria: A Time-Series Analysis

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Abstract

This study examined how oil price volatility affects economic growth and financial stability in Nigeria, using annual secondary data for 2000–2025. Oil price volatility (OPV) is measured as annual percentage volatility of crude oil prices, growth as real GDP growth, and financial stability by a composite index (FSI), with the non-performing loan ratio, credit, external reserves, the monetary policy rate and the fiscal balance as supporting indicators and controls. The analysis combines unit-root tests, ARDL bounds testing, first-difference models, Toda–Yamamoto Granger causality, a vector autoregression (VAR) with impulse responses and variance decompositions, and structural-break and robustness tests. Oil price volatility has a strong and robust short-run negative association with financial stability. A 10-percentage-point rise in volatility lowers the FSI by about 0.024 points in the same year, roughly 0.4 of its standard deviation, and the result holds across six alternative specifications. No long-run relationship with the FSI exists (bounds F = 1.73, below the lower critical value), and impulse responses show the effect fading within three years. The effect on growth is weaker: the baseline short-run coefficient is −0.176 (p = 0.047), but the long-run effect is insignificant and the short-run effect loses significance once crisis years or credit and reserves controls are added. No lagged Granger causality is detected among oil volatility, growth and financial stability, which points to same-year transmission in annual data. Volatility is unrelated to non-performing loans, while the fiscal balance is a stronger and more consistent driver of both financial stability and non-performing loans. The paper recommends rule-based fiscal buffers, oil-volatility scenarios in bank stress tests with countercyclical capital and liquidity buffers, coordinated fiscal and monetary policy, and sustained economic diversification

Keywords: *Oil price volatility; economic growth; financial stability; ARDL bounds test; VAR; Nigeria.*

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Introduction

Nigeria's public finances and external accounts depend heavily on crude oil, so swings in global prices pass quickly into government revenue, foreign-exchange supply and bank balance sheets. The World Bank (2023) and the IMF (2023) both describe oil receipts as a primary driver of fiscal capacity, reserves and macroeconomic stability. Volatility has risen in recent decades because of geopolitical conflict, demand uncertainty, the 2014–2016 price collapse and the 2020 pandemic shock.

Evidence on the growth channel is consistent. Udoh et al. (2023) and Mgbomene et al. (2022) find that oil price instability depresses output by distorting fiscal planning and reducing productive investment. Evidence on the financial channel runs through exchange rates, liquidity and credit risk: the CBN (2023) links oil price declines to higher non-performing loans and tighter liquidity, while Lawal, Somoye and Babajide (2018) and Adekoya and Oliyide (2021) document strong effects on stock-market returns and financial stress.

In an ideal economic setting, an oil-exporting country such as Nigeria would be able to leverage oil revenues to promote stable and sustainable economic growth, while simultaneously maintaining financial system resilience. Oil price movements would be effectively absorbed through strong fiscal buffers, diversified revenue sources, and robust monetary and financial institutions. Economic growth would be less sensitive to external oil price shocks, and financial markets and banking institutions would remain stable even during periods of global oil price volatility. In such a scenario, macroeconomic policies would be well-coordinated, enabling oil revenue windfalls to support long-term development without destabilizing the financial system.

Contrary to this ideal, Nigeria continues to experience persistent vulnerability to oil price volatility, which significantly disrupts economic growth and undermines financial stability. The heavy dependence on crude oil revenues exposes the economy to external shocks, resulting in unstable growth patterns, exchange rate volatility, inflationary pressures, and fiscal imbalances. Oil price fluctuations affect government revenue and foreign exchange availability, which in turn influence banking sector liquidity, credit conditions, and financial market performance. Despite numerous studies on oil price volatility and economic growth, empirical evidence remains fragmented, with limited research jointly examining oil price volatility, economic growth, and financial stability within a single analytical framework for Nigeria. This lack of integrated empirical insight constrains effective policy formulation aimed at reducing macro-financial vulnerability.

If the challenges posed by oil price volatility are not adequately addressed, Nigeria risks experiencing continued economic instability and weakened financial system resilience. Persistent exposure to oil price shocks may lead to recurring growth slowdowns, heightened financial market volatility, and increased banking sector fragility. Over time, unresolved oil-induced instability could discourage domestic and foreign investment, exacerbate fiscal deficits, and erode public confidence in economic institutions. Ultimately, the failure to understand and manage the interconnected effects of oil price volatility on economic growth and financial stability may hinder Nigeria’s ability to achieve sustainable development and long-term macroeconomic stability.

Objectives of the Study

The specific objectives of the study are to:

i. To estimate the short-run and long-run effects of oil price volatility on economic growth in Nigeria.
ii. To estimate the short-run and long-run effects of oil price volatility on financial stability in Nigeria.
iii. To determine the direction of causality among oil price volatility, economic growth and financial stability.
iv. To examine the dynamic interaction and shock propagation among oil price volatility, economic growth and financial stability.
v. To test whether these relationships changed structurally during the 2014–2016 oil price collapse and the 2020 shock.

Research questions

The study provided answers to the following research questions.

i. What are the short-run and long-run effects of oil price volatility on Nigeria's economic growth?
ii. How does oil price volatility affect Nigeria's financial stability?
iii. In which direction does causality run among oil price volatility, economic growth and financial stability?
iv. How do shocks to oil price volatility propagate dynamically to economic growth and financial stability over time?
v. Did the relationships shift structurally during major oil price episodes?

Hypotheses (null form)

The study tests the following null hypotheses at the 5% significance level:

H_o1: Oil price volatility has no significant effect on economic growth in Nigeria.

H_o2: Oil price volatility has no significant effect on financial stability in Nigeria.

H_o3: There is no causal relationship among oil price volatility, economic growth and financial stability.

H_o4: Shocks to oil price volatility have no significant dynamic effect on economic growth and financial stability.

H_o5: The estimated relationships are stable over the sample period.

Scope and contribution

The study covers Nigeria from 2000 to 2025, a sample of 26 annual observations that includes the 2008–2009 global financial crisis, the 2014–2016 oil price collapse and the 2020 pandemic shock. It contributes by (i) using oil price volatility, not the price level, as the key explanatory variable; (ii) assessing financial stability through a composite index and through non-performing loans; (iii) analysing growth and stability in one dynamic system; and (iv) testing the stability of the relationships across crisis episodes.

Review of Related Literature

Conceptual review

Oil Price Volatility

Oil price volatility refers to the frequent and unpredictable fluctuations in the global price of crude oil that arise from shifts in supply, demand, geopolitical tensions, and market expectations. These price movements are not random but reflect underlying uncertainty in energy markets, influencing investment decisions, production levels, and risk assessment across economies (Chen et al., 2024).

In academic research, oil price volatility is conceptualized as a form of market uncertainty that transmits economic risk through multiple channels. It affects corporate investment, particularly in energy-dependent sectors, because firms adjust capital expenditures when price unpredictability rises (Chen et al., 2024). Volatility is thus considered a persistent risk factor that shapes strategic behavior and long-term planning in global and domestic markets.

Economists often model oil price volatility using statistical frameworks such as Generalized Autoregressive Conditional Heteroskedasticity (GARCH) to capture time-varying uncertainty and volatility clustering. Recent studies indicate that higher volatility predicts reduced economic output and slower growth, as firms build precautionary inventories and curtail oil consumption. These findings highlight the macroeconomic transmission channels through which volatility influences real economic performance (Hu et al., 2022).

Oil price volatility results from both supply-side and demand-side shocks, including geopolitical tensions, production decisions by major oil exporters, and abrupt global demand changes. The COVID-19 pandemic illustrated how simultaneous supply and demand shocks can sharply amplify volatility, demonstrating that price fluctuations often reflect deep structural disruptions rather than short-term market noise (International Economics, 2021).

Furthermore, oil price volatility acts as a risk channel affecting financial markets, exchange rates, and inflation expectations. Rising volatility increases economic uncertainty, raises risk premia, and may reduce investment, particularly in oil-importing economies. Moreover, policymakers consider volatility crucial in designing stabilization policies because persistent fluctuations generate widespread effects across both financial and real sectors, influencing economic growth and fiscal stability (Musampa, 2023).

Economic Growth

Economic growth is a core economic concept denoting the sustained increase in a nation's production of goods and services, reflected in rising real output over time. It captures changes in overall economic performance and capacity, often proxied by Gross Domestic Product (GDP) growth measured in inflation-adjusted terms to reflect real production changes. This concept underpins evaluations of economic welfare, standard of living, and efficient resource utilization (Fikri et al., 2024).

Economic growth embodies both quantitative expansion and structural transformation in an economy's productive base. It involves increases in labor productivity, capital accumulation, technological progress, and human capital

enhancement, which together expand the economy's output frontier. Scholars distinguish between extensive growth driven by input increases and intensive growth driven by productivity improvements, emphasizing that sustained development relies largely on the latter (Fikri et al., 2024).

Measurement of economic growth typically focuses on real GDP and GDP per capita, capturing output changes adjusted for inflation and population shifts. Real GDP growth indicates how much more an economy produces, whereas GDP per capita highlights changes in average income and living standards. These measures facilitate cross-country comparisons, temporal analysis, and policy evaluation, helping governments and institutions understand economic performance and identify areas for intervention (Roser, 2021).

Contemporary literature emphasizes the link between economic growth and broader socioeconomic outcomes. Growth fosters employment creation, poverty reduction, and increased public revenue, enabling investments in infrastructure, education, and healthcare. The effectiveness of growth is influenced by entrepreneurship, institutional quality, and macroeconomic stability, illustrating that growth reflects deep economic dynamics beyond mere output increases (Cervelló-Royo, et al., 2024).

Moreover, economic growth is shaped by both internal factors, such as human capital and technological innovation, and external influences like global market conditions and policy frameworks. Economic policies that stimulate productive investment, improve efficiency, and support technological adoption tend to enhance growth trajectories. Moreover, understanding these drivers is central to designing sustainable development strategies that strengthen both advanced and developing economies (Cervelló-Royo, et al., 2024).

Financial Stability

Financial stability refers to the condition in which the financial system, including institutions, markets, and infrastructures, operates efficiently, allocates resources effectively, and absorbs shocks without significant disruption to its core functions. A stable financial system ensures continuous credit provision, risk management, and confidence in intermediation processes, enabling households and firms to engage in economic activities even during periods of stress (World Bank, 2023; Joudar et al., 2025).

In academic research, financial stability is conceptualized as the resilience of institutions and markets to internal and external shocks that may otherwise destabilize the economy. This resilience is reflected in the ability of banks and non-bank financial intermediaries to withstand liquidity shortages, credit defaults, and sudden market losses without significant impairment to core services such as payments, lending, and risk-pricing mechanisms (Joudar et al., 2025).

Financial stability is often assessed using systemic indicators such as capital adequacy ratios, asset quality, liquidity measures, and stress-testing results. These indicators evaluate how well financial institutions and markets can absorb shocks and maintain operations under stress conditions. Empirical studies indicate that greater system resilience reduces the probability of systemic crises, increases investor confidence, and supports sustainable economic performance (Trinh & Tran, 2024).

The literature emphasizes that financial stability depends not only on the health of individual institutions but also on the effectiveness of regulatory and supervisory frameworks. Macroprudential policies, capital buffers, and proactive risk-management practices strengthen the system's capacity to absorb shocks and prevent contagion. Research shows that robust regulation and timely policy interventions mitigate the accumulation of vulnerabilities that could otherwise trigger widespread financial instability (Stanciu, 2024).

Moreover, financial stability underpins economic growth by ensuring uninterrupted credit flows, efficient payment systems, and continuous investment even during stress periods. Stable financial systems foster confidence among domestic and foreign investors, support broad access to finance, and allow markets to adjust to shocks without amplifying adverse effects on the economy. Moreover, understanding and maintaining financial stability is critical for long-term structural development and sustainable macroeconomic outcomes (World Bank, 2023.; Joudar et al., 2025).

Oil revenue dependence and macro-financial linkages. Dependence on oil rents weakens non-oil tax bases, encourages pro-cyclical spending and exposes public finances to price swings (Aker & Akalpler, 2025; Masi, Savoia & Sen, 2024; Olajide & Okafor, 2023). Macro-financial linkages describe the two-way feedback between the real economy and the financial sector, in which weak growth raises non-performing loans and tighter credit further weakens growth (Claessens & Kose, 2018; Ponomarenko, Rozhkova & Seleznev, 2018). These feedbacks are the reason the study estimates growth and financial stability in one dynamic system.

Theoretical Review

This study was theoretically underpinned on The Resource Curse Theory

The Resource Curse Theory

The Resource Curse Theory explains the paradox whereby countries endowed with abundant natural resources, especially oil and gas, tend to experience slower economic growth, higher economic volatility, and weaker financial and institutional development compared to resource-poor countries. The theory argues that heavy reliance on natural resource revenues exposes economies to external shocks arising from fluctuations in global commodity prices. These price fluctuations can lead to unstable government revenues, pro-cyclical fiscal policies, exchange rate volatility, inflationary pressures, and inefficient allocation of resources. Over time, such instability undermines productive investment, weakens financial institutions, and constrains sustainable economic growth (Auty, 1993; Sachs & Warner, 2001).

Relevance to the Study

i. The Resource Curse Theory is highly relevant to the study on oil price volatility, economic growth, and financial stability in Nigeria for the following reasons:
ii. Nigeria's economy relies heavily on crude oil exports for foreign exchange earnings and government revenue, making it vulnerable to oil price volatility.

iii. Fluctuations in oil prices can disrupt investment planning, reduce output growth, and create macroeconomic instability, consistent with the predictions of the Resource Curse Theory.

iv. Oil price shocks affect banking sector liquidity, credit risk, and fiscal sustainability, thereby threatening financial system stability.

v. The theory provides a framework for understanding how oil price volatility is transmitted through fiscal, monetary, and financial channels to influence economic growth and stability.

Empirical Review

Alenoghena (2020) investigated the effects of oil price shocks on the macroeconomic performance of the Nigerian economy using a Structural Vector Autoregression (SVAR) approach. The study employed annual time-series data covering the period 1980–2018 to examine the responses of economic growth, inflation, interest rates, exchange rates and industrial production to oil price shocks. The findings revealed that oil price shocks significantly and negatively affected economic growth and industrial output, while their effects on inflation and exchange rates were mixed. The impulse response analysis further demonstrated that output responded negatively to oil price shocks, suggesting that fluctuations in the international oil market can adversely affect Nigeria's macroeconomic performance. The study provides evidence of the vulnerability of the Nigerian economy to oil market disturbances, although its emphasis was on oil price shocks rather than the broader effects of oil price volatility on financial stability.

Adesete and Bankole (2020) examined the effects of oil price shocks on major macroeconomic aggregates in Nigeria using the Structural Vector Autoregressive (SVAR) approach. The study employed impulse response functions to investigate the responses of economic growth, investment, imports, inflation and exchange rates to oil price shocks. The findings indicated that oil price shocks exerted adverse effects on several macroeconomic indicators, with economic growth, investment and other macroeconomic variables responding negatively to disturbances in oil prices over time. The impulse response results also suggested that the effects of oil price shocks became evident within approximately twelve months. The study highlights the importance of oil market developments in shaping Nigeria's macroeconomic performance and reinforces the need for policies that reduce the economy's vulnerability to external oil price disturbances.

Lawal, Somoye and Babajide (2018) investigated the impact of oil price shocks and exchange rate volatility on stock market behaviour in Nigeria. The study employed monthly data and applied the Exponential Generalised Autoregressive Conditional Heteroskedasticity (EGARCH) model to examine the effects of oil price and exchange rate fluctuations on stock market volatility. The findings revealed that oil price volatility and exchange rate volatility significantly contributed to stock market volatility, indicating that uncertainty in the international oil market can transmit risks to the domestic financial market. The study demonstrates the relevance of oil market developments to financial market stability in Nigeria. However, its focus was primarily on stock market behaviour rather than a broader assessment of financial stability through a composite index.

Orji, Nwagu, Ogbuabor, Nwosu and Anthony-Orji (2023) examined the relationship between crude oil price volatility and selected economic sectors in Nigeria. The study utilised quarterly data covering the period 1981Q1–2015Q4 and adopted the Exponential Generalised Autoregressive Conditional Heteroskedasticity (EGARCH) model to investigate the effects of oil price volatility on the transportation, manufacturing and agricultural sectors. The findings revealed that crude oil price volatility negatively and significantly affected output in the selected sectors, indicating that fluctuations in crude oil prices can disrupt productive activities across different segments of the Nigerian economy. The study provides sectoral evidence of the adverse consequences of oil price volatility and reinforces the importance of reducing the vulnerability of domestic production to external oil market uncertainties.

Folasade (2024) examined the effects of oil price volatility on industrial productivity in Nigeria and Egypt through a comparative analysis. The study employed cointegration analysis and an Error Correction Model (ECM) to investigate the short-run and long-run relationships between oil price volatility and industrial productivity in the two countries. The findings indicated that oil price volatility significantly constrained industrial productivity in Nigeria, with the adverse effect being more pronounced than in Egypt. This difference was attributed to Nigeria's greater dependence on oil revenues and relatively weaker industrial diversification. The study underscores the importance of economic diversification in mitigating the adverse consequences of oil price volatility and provides comparative evidence of the vulnerability of oil-dependent economies to external price fluctuations.

Table 1: Summary of Empirical Studies on Oil Price Volatility, Economic Growth and Financial Stability

Study	Data and method	Main finding
Alenoghena (2020)	Annual 1980–2018; structural VAR	Oil price shocks significantly reduce growth and industrial output; mixed effects on inflation and exchange rate
Adesete & Bankole (2020)	SVAR with impulse responses	Oil shocks adversely affect growth, investment, imports, inflation and exchange rate within about 12 months
Lawal, Somoye & Babajide (2018)	Monthly; EGARCH	Oil price and exchange-rate volatility significantly raise stock-market volatility
Orji et al. (2023)	Quarterly 1981–2015; EGARCH	Oil volatility reduces output in transport, manufacturing and agriculture
Folasade (2024)	Cointegration and ECM; Nigeria and Egypt	Volatility hinders industrial productivity, more strongly in Nigeria than Egypt
Udoh et al. (2023)	Time series, Nigeria	Significant negative growth effect, especially in sustained price declines
Mgbomene et al. (2022)	Time series, Nigeria	Volatility weakens long-run growth through uncertainty and lower investment
Adekoya & Oliyide (2021)	Cross-country	Oil uncertainty amplifies financial stress; Nigeria among the strongest responses in Sub-Saharan Africa

Source: Author's compilation from the reviewed empirical studies.

Research gap

Most Nigerian studies examine either real-sector outcomes or financial-market indicators in isolation, and few treat oil price volatility, growth and a measured financial stability index together. Studies that do combine them often rely on single-equation models that cannot show causal direction, how shocks spread over time, or whether the relationships change during crisis episodes. This study fills the gap by estimating the three variables jointly from annual observed data for 2000–2025, adding non-performing loans, credit, external reserves, the monetary policy rate and the fiscal balance, and testing causality, dynamic propagation and structural stability.

Synthesis and gap. The evidence agrees on a negative effect on growth and a destabilising effect on markets, but it is split between growth studies and market studies. None of the reviewed studies estimates volatility, growth and a measured financial stability index jointly while testing for structural change. This study fills that gap.

Methodology

Research design

The study uses an ex post facto, quantitative time-series design based entirely on secondary data. Estimation follows five stages: (1) descriptive analysis and unit-root testing; (2) ARDL bounds testing for the growth and financial stability equations; (3) Toda–Yamamoto causality tests; (4) a VAR with impulse responses and variance decompositions; and (5) diagnostic, structural-break and robustness tests.

Data and variables

The dataset contains 26 annual observations for Nigeria, 2000–2025, on eleven series.

Table 2: Definition, Measurement and Classification of Study Variables

Variable	Symbol	Definition and unit	Role
Oil price	OILP	Crude oil price, US$ per barrel	Descriptive; robustness
Oil price volatility	OPV	Annual volatility of crude oil prices, %	Key explanatory variable
Economic growth	GDPG	Real GDP growth rate, %	Dependent variable (Objective 1)
Financial stability index	FSI	Composite index, 0–1 scale; higher means more stable	Dependent variable (Objective 2)
Non-performing loans	NPL	Non-performing loan ratio, decimal	Alternative stability measure
Exchange rate	EXR	Naira per US dollar	Descriptive; robustness (log change)
Inflation	INF	Annual inflation rate, %	Control
Credit	CRD	Private-sector credit, %	Control (robustness)
External reserves	RES	US$ billion	Control (robustness)
Monetary policy rate	MPR	Percent	Control (robustness)
Fiscal balance	FISC	Fiscal balance, decimal (negative = deficit)	Control

Treatment of the 2004 outlier. GDP growth in 2004 is 33.7%, more than four standard deviations above the sample mean. It is consistent with the level shift that follows the rebasing of Nigeria's national accounts, not with an economic boom, so it is handled with a one-year dummy (D2004) in all growth and VAR models. Robustness checks drop or winsorise the observation instead.

Crisis years. A dummy (CRISIS) marks 2015, 2016 and 2020, the years of the oil price collapse and the pandemic shock.

Stage 1: unit-root tests

Augmented Dickey–Fuller tests (Dickey & Fuller, 1979; constant, up to two lags chosen by AIC) and KPSS tests (Kwiatkowski et al., 1992; constant, 5% critical value 0.463) establish the order of integration. The ARDL approach accepts a mix of I(0) and I(1) variables but not I(2) series.

Stage 2: Autoregressive Distributed Lag (ARDL) Bounds Testing and Error-Correction Model (H01 and H02)

Following Pesaran, Shin and Smith (2001), the Autoregressive Distributed Lag (ARDL) bounds-testing approach is employed to examine the short-run and long-run relationships between oil price volatility, economic growth and financial stability in Nigeria. The ARDL approach is appropriate for time-series models containing a mixture of I(0) and I(1) variables, provided that none of the variables is integrated of order two, I(2).

Two separate unrestricted error-correction models (UECMs) are specified to examine the effects of oil price volatility on economic growth and financial stability, respectively.

Economic growth model

The unrestricted error-correction representation for economic growth is specified as:

$$\begin{aligned}\Delta GDPG_t = {} & \alpha_0 + \lambda_1 GDPG_{t-1} \\ & + \lambda_2 OPV_{t-1} + \lambda_3 INF_{t-1} \\ & + \lambda_4 FISC_{t-1} + \gamma_1 \Delta OPV_t \\ & + \gamma_2 \Delta INF_t + \gamma_3 \Delta FISC_t \\ & + \delta D2004_t + \varepsilon_t\end{aligned}$$

Where:

$GDPG$ represents economic growth, measured by the real GDP growth rate.

OPV represents oil price volatility.

INF represents the annual inflation rate.

$FISC$ represents the fiscal balance.

$D2004$ is a dummy variable introduced to account for the unusual GDP growth observation associated with the 2004 national accounts rebasing.

α_0 represents the intercept.

$\lambda_1, \lambda_2, \lambda_3, \lambda_4$ are the coefficients of the lagged level variables.

$\gamma_1, \gamma_2, \gamma_3$ capture the short-run effects of changes in the explanatory variables.

δ represents the coefficient of the 2004 dummy variable.

ε_t represents the stochastic error term.

Financial stability model

The corresponding unrestricted error-correction representation for financial stability is specified as:

$$\begin{aligned}\Delta FSI_t = {} & \alpha_0 + \theta_1 FSI_{t-1} \\ & + \theta_2 OPV_{t-1} + \theta_3 INF_{t-1} \\ & + \theta_4 FISC_{t-1} + \gamma_1 \Delta OPV_t \\ & + \gamma_2 \Delta INF_t + \gamma_3 \Delta FISC_t \\ & + \varepsilon_t\end{aligned}$$

Where FSI represents the financial stability index, with higher values indicating greater financial stability. The other variables retain their previous definitions. The 2004 dummy is excluded from this equation because the exceptional observation relates specifically to the economic growth series.

Bounds-testing procedure

The existence of a long-run relationship is examined using the joint F-statistic for the lagged level variables.

For the economic growth equation, the null hypothesis is:

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = 0$$

For the financial stability equation, the null hypothesis is:

$$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = 0$$

The calculated F-statistics are compared with the appropriate lower-bound I(0) and upper-bound I(1) critical values. If the calculated F-statistic exceeds the upper-bound critical value, the null hypothesis of no long-run relationship is rejected. If it falls below the lower-bound critical value, the null hypothesis is not rejected. A statistic falling between the two bounds produces an inconclusive result.

Given the relatively small sample size of 26 annual observations, finite-sample critical values are obtained through Monte Carlo simulation using 4,000 replications, subject to the specified data-generating processes, sample size, lag structure and deterministic components. The simulations provide the lower and upper critical bounds corresponding to the I(0) and I(1) cases.

Estimation of long-run and short-run effects

Where a valid long-run relationship is established, the long-run coefficient of oil price volatility in the economic growth equation is calculated as:

$$\beta_{OPV} = -\frac{\lambda_2}{\lambda_1}$$

Similarly, the long-run coefficient of oil price volatility in the financial stability equation is calculated as:

$$\beta_{OPV} = -\frac{\theta_2}{\theta_1}$$

The standard errors of the long-run coefficients are estimated using the delta method.

The short-run effect of oil price volatility is captured by the coefficient of its first-differenced term, γ_1. A negative and statistically significant coefficient indicates that an increase in oil price volatility adversely affects economic growth or financial stability in the short run.

Alternative specification where cointegration is not established

Where the bounds test does not establish a long-run relationship, the relevant dependent variable is estimated in first differences to examine the short-run dynamics without imposing an unsupported long-run equilibrium relationship.

For financial stability, the alternative first-difference specification is:

$$\begin{aligned}\Delta FSI_t = \ & \alpha_0 + \alpha_1 \Delta FSI_{t-1} \\ & + \alpha_2 \Delta OPV_t + \alpha_3 \Delta INF_t \\ & + \alpha_4 \Delta FISC_t + \varepsilon_t\end{aligned}$$

Heteroskedasticity-consistent HC1 standard errors, following MacKinnon and White (1985), are employed to improve the reliability of statistical inference.

Treatment of stationary dependent variables

Since the unit-root results indicate that economic growth is stationary at level, I(0), the bounds-test result for the growth equation is interpreted cautiously. A stationary dependent variable may generate a significant bounds F-statistic without establishing a meaningful long-run equilibrium relationship between the explanatory variables and the dependent variable. Therefore, conclusions concerning the long-run effect of oil price volatility are based on the individual coefficient estimates, their statistical significance and an alternative levels ARDL specification rather than the bounds F-statistic alone.

Decision rule

All statistical tests are evaluated at the 5% significance level. The null hypothesis is rejected where the relevant p-value is less than 0.05.

Stage 3: Toda–Yamamoto causality (H03)

A VAR of order k + d_max is estimated in levels, where k = 1 is chosen by AIC, BIC and HQ criteria and d_max = 1 is the maximum order of integration. A Wald test is applied to the first k lags only (Toda & Yamamoto, 1995), which is valid whether variables are I(0) or I(1).

Stage 4: VAR dynamics (H04)

A VAR(1) in levels for OPV, GDPG and FSI, with D2004 as an exogenous variable (Sims, 1980), yields impulse responses and forecast-error variance decompositions. OPV is ordered first because Nigeria is a price taker in the global oil market, followed by GDPG and FSI. Impulse responses cover ten years with 90% bands from a residual bootstrap (2,000 replications). Because variance decompositions depend on ordering, they are also computed with OPV ordered last.

Stage 5: diagnostics, stability and robustness (H05)

Check	Test	Purpose
Serial correlation	Breusch–Godfrey LM, two lags (Breusch, 1978; Godfrey, 1978)	Residuals uncorrelated
Heteroskedasticity	Breusch–Pagan (Breusch & Pagan, 1979)	Constant error variance
Normality	Jarque–Bera (Jarque & Bera, 1987)	Valid inference
Specification	Ramsey RESET (Ramsey, 1969)	Correct functional form
Parameter stability	CUSUM (Brown, Durbin & Evans, 1975)	Stable coefficients
Structural break	Sup-F (Quandt–Andrews) with 20% trimming (Andrews, 1993)	Unknown-date break
Crisis effects	CRISIS dummy and OPV × CRISIS interaction	Different behaviour in crisis years
VAR stability	Roots of the characteristic polynomial outside the unit circle	Valid impulse responses
Robustness	Alternative controls, outlier treatment, oil price level, exchange-rate change, dropped years, NPL as the dependent variable	Results do not depend on specification

Software

All statistical analyses and econometric estimations were conducted using Python (Version 3.13). The statsmodels, SciPy, and pandas libraries were employed for data management, statistical analysis, econometric modelling, hypothesis testing, and diagnostic procedures.

Results and Discussion

Descriptive statistics

Oil price volatility averaged 25.3% over 2000–2025 and ranged from 13.9% (2007) to 49.7% (2020). The five most volatile years were 2020 (49.7%), 2009 (45.2%), 2015 (42.6%), 2016 (39.8%) and 2008 (38.6%), which match the global financial crisis, the oil price collapse and the pandemic. Growth was lowest in 2020 (−1.8%) and 2016 (−1.6%), and the financial stability index was lowest in the same two years (0.53 and 0.56).

Table 3: Descriptive Statistics of Study Variables, 2000–2025

Variable	Mean	Std. dev.	Minimum	Maximum	Jarque–Bera p
OILP (US$)	66.85	27.22	24.4	111.7	0.573
OPV (%)	25.33	10.39	13.9	49.7	0.133
GDPG (%)	5.35	6.44	−1.8	33.7	<0.001
FSI	0.647	0.060	0.53	0.75	0.634
NPL	0.154	0.040	0.115	0.289	<0.001
EXR (₦/$)	313.4	362.2	101.7	1,478.0	<0.001
INF (%)	14.29	6.11	5.4	33.2	0.006
CRD (%)	24.43	5.96	12.4	32.4	0.189
RES (US$bn)	33.13	13.15	7.1	53.0	0.255
MPR (%)	13.99	5.07	6.0	27.5	0.012
FISC	−0.025	0.023	−0.056	0.031	0.079

Notes: n = 26 annual observations (2000–2025). Jarque–Bera p-values test the null of normality. Source: Author's computation from secondary data.

The two sub-periods differ sharply. Volatility was higher and conditions weaker after 2014.

Table 4: Descriptive Statistics by Sub-Period, 2000–2014 versus 2015–2025

Mean	2000–2014	2015–2025
OPV (%)	22.2	29.6
GDPG (%)	7.9	1.9
FSI	0.679	0.603
NPL	0.164	0.140
INF (%)	11.8	17.7

Notes: Sub-period means computed from the full 2000–2025 sample. Source: Author's computation.

OPV is negatively correlated with FSI (r = −0.51, p = 0.007) and with GDPG (r = −0.26, p = 0.196; r = −0.37, p = 0.069 without 2004), positively with NPL (r = 0.36) and negatively with the fiscal balance (r = −0.43). Average NPL fell after 2014 even though stability weakened by other measures, so NPL alone is a poor summary of stability, which justifies the composite index.

Table 5: Unit-Root Test Results (ADF and KPSS)

Variable	ADF level (stat, p)	ADF first difference (stat, p)	KPSS (5% critical 0.463)	Order
OPV	−3.77, 0.003	−4.39, <0.001	0.32	I(0)
GDPG	−3.87, 0.002	−5.27, <0.001	0.44	I(0)
FSI	−2.54, 0.106	−4.38, <0.001	0.27	I(1)
NPL	−3.50, 0.008	−5.15, <0.001	0.37	I(0)
INF	−2.18, 0.214	−4.21, 0.001	0.43	I(1)
CRD	−1.91, 0.326	−3.31, 0.015	0.66	I(1)
RES	−2.88, 0.048	−4.42, <0.001	0.34	I(0), borderline
MPR	−0.46, 0.900	−5.04, <0.001	0.27	I(1)
FISC	−1.64, 0.465	−4.09, 0.001	0.44	I(1)
ln EXR	2.40, 0.999	−3.46, 0.009	0.69	I(1)
OILP	−2.16, 0.222	−4.21, 0.001	0.26	I(1)

Notes: ADF tests include a constant with lag length chosen by AIC (maximum two lags). KPSS tests use a constant; the 5% critical value is 0.463. Source: Author's computation.

OPV, GDPG and NPL are stationary in levels, while FSI, inflation, credit, the policy rate, the fiscal balance, the exchange rate and the oil price are integrated of order one. No series is I(2), so the ARDL bounds approach applies.

Oil price volatility and economic growth (H01)

Bounds test. The F-statistic is 30.48 against simulated bounds of 4.26–5.40 at 5% and 6.75–7.95 at 1%, which rejects the null. However, GDPG is stationary and its lagged coefficient is −0.997, so the large F-statistic reflects the stationarity of growth, not a long-run link with oil volatility. The conclusion therefore rests on the coefficients below.

Table 6: ARDL Bounds Test and Long-Run/Short-Run Estimates for the Economic Growth Equation (H01)
Panel A: Bounds test

Statistic	**Value**
F-statistic	30.48
Simulated 5% bounds (I(0)–I(1))	4.26–5.40
Simulated 1% bounds (I(0)–I(1))	6.75–7.95
Decision	Null of no long-run relationship rejected

Panel B: Coefficient estimates

Regressor	**Coefficient**	**Std. error**	**p-value**
GDPG(t−1)	−0.997	0.095	<0.001
OPV(t−1), long-run term	−0.091	0.083	0.289
INF(t−1)	0.019	0.122	0.876
FISC(t−1)	77.748	35.987	0.046
ΔOPV (short run)	−0.176	0.081	0.047
ΔINF	0.028	0.130	0.834
ΔFISC	−36.040	54.527	0.518
D2004	28.688	2.627	<0.001
Constant	8.188	2.607	0.006

Notes: $R^2 = 0.939$ (adjusted 0.909); n = 25 after lag and dummy adjustment. Implied long-run OPV coefficient = −0.092 (SE 0.085, t = −1.08, p = 0.289). Implied long-run FISC coefficient = +77.98 (SE 33.36, t = 2.34). Bounds critical values obtained by Monte Carlo simulation (4,000 replications). Source: Author's computation.

An improvement of one percentage point of GDP (0.01) is associated with 0.78 points higher growth.

Interpretation. The short-run coefficient implies that a 10-point rise in volatility lowers growth by about 1.8 points in the same year (p = 0.047, or 0.008 with robust errors). A levels ARDL(1,1) check finds a long-run multiplier of −0.020 (p = 0.840), confirming no lasting effect.

Table 7: Robustness Checks for the Oil Price Volatility–Growth Relationship

Specification	ΔOPV coefficient (p)	OPV(t−1) coefficient (p)
Baseline	−0.176 (0.047)	−0.091 (0.289)
Baseline, robust (HC1) errors	−0.176 (0.008)	−0.091 (0.360)
Drop 2004 observation	−0.177 (0.027)	−0.079 (0.324)
Winsorise 2004 growth	−0.176 (0.027)	−0.086 (0.270)
Exchange-rate change replaces inflation	−0.177 (0.034)	−0.092 (0.259)
Add oil price level	−0.178 (0.061)	−0.115 (0.262)
Add credit and reserves	−0.119 (0.187)	−0.035 (0.700)
Add crisis dummy	−0.056 (0.593)	−0.026 (0.772)

Notes: p-values in parentheses. HC1 = heteroskedasticity-consistent standard errors (MacKinnon & White, 1985). Source: Author's computation.

The short-run effect survives outlier and exchange-rate adjustments but is lost when credit and reserves or the crisis dummy are added. The growth effect is therefore fragile: it largely reflects the crisis years themselves, in which volatility and weak growth coincide, and the long-run effect is never significant.

Decision on H01: the null is not rejected on robust evidence. There is weak short-run evidence in the baseline model only.

Oil price volatility and financial stability (H02)

Bounds test. The F-statistic is 1.73, below the lower bounds of 3.48 (10%), 4.27 (5%) and 6.76 (1%). There is no cointegration between FSI and oil volatility, and the FSI (I(1)) is therefore modelled in first differences.

Table 8: ARDL Bounds Test and First-Difference Estimates for the Financial Stability Equation (H02)
Panel A: Bounds test

Statistic	**Value**
F-statistic	1.73
10% bounds (I(0)–I(1))	3.48–4.41
5% bounds (I(0)–I(1))	4.27–5.40
1% bounds (I(0)–I(1))	6.76–7.95
Decision	Null of no long-run relationship not rejected

Panel B: First-difference estimates

Regressor	**Coefficient**	**Std. error (HC1)**	**p-value**
ΔFSI(t−1)	0.224	0.124	0.072
ΔOPV	−0.0024	0.0006	<0.001
ΔINF	−0.0008	0.0014	0.553
ΔFISC	1.158	0.380	0.002
Constant	0.002	0.005	0.687

Notes: R^2 = 0.791 (adjusted 0.747); n = 24. HC1 standard errors. A 10-point rise in OPV lowers the FSI by about 0.024 (≈0.4 standard deviations of the index). Source: Author's computation.

Table 9: Robustness Checks for the Oil Price Volatility–Financial Stability Relationship

Specification	ΔOPV coefficient (p)
Baseline (HC1)	−0.0024 (<0.001)
No lagged dependent change	−0.0020 (0.001)
Add crisis dummy	−0.0011 (0.030)
Add policy rate, reserves and credit	−0.0021 (<0.001)
Add change in oil price	−0.0022 (<0.001)
Exchange-rate change replaces inflation	−0.0025 (<0.001)
Drop 2009	−0.0024 (<0.001)

Notes: p-values in parentheses. The coefficient is negative and significant in every specification. Source: Author's computation.

The coefficient is negative and significant in every specification. Adding the crisis dummy halves its size, and the dummy itself is large (−0.068, $p < 0.001$), so part of the volatility effect operates through crisis episodes. Credit growth raises stability (+0.014, $p = 0.008$), and a rise in the oil price level also raises it (+0.0007, $p = 0.010$). The exchange-rate change is not significant ($p = 0.376$).

Non-performing loans. NPL gives a different picture. The bounds F-statistic of 3.70 is inconclusive (10% bounds 3.48–4.41), and in first differences the volatility coefficient is zero ($p = 0.936$), whereas the fiscal balance is strongly significant (−2.33, $p < 0.001$). Oil volatility affects the broad stability index but not bank asset quality directly, and fiscal deterioration is the main correlate of loan distress.

Decision on H02: the null is rejected for the short run. There is no long-run relationship.

Causality among the variables (H03)

Toda–Yamamoto tests use a VAR(2) (k = 1, d_max = 1, n = 24, with D2004). No directional causality is found in either direction.

Table 10: Toda–Yamamoto Granger Causality Test Results (H03)

Null hypothesis	Chi-square (df = 1)	p-value	Decision
OPV does not Granger-cause GDPG	0.013	0.910	Not rejected
OPV does not Granger-cause FSI	0.970	0.325	Not rejected
GDPG does not Granger-cause FSI	1.230	0.267	Not rejected
FSI does not Granger-cause GDPG	0.099	0.753	Not rejected
GDPG does not Granger-cause OPV	0.117	0.732	Not rejected
FSI does not Granger-cause OPV	0.388	0.533	Not rejected

Notes: VAR(2) estimated in levels (k = 1, d_max = 1); n = 24; D2004 included as an exogenous variable. Wald tests applied to the first k lags only (Toda & Yamamoto, 1995). Source: Author's computation.

The last two rows support treating oil volatility as exogenous to Nigeria. The absence of lagged causality means that last year's volatility adds no predictive power for this year's growth or stability beyond what current conditions already show. Transmission in annual data is therefore same-year, as the contemporaneous coefficients in indicated above.

Decision on H03: the null is not rejected.

Dynamic responses and variance decomposition (H04)

The VAR(1) is stable: the smallest root has modulus 1.605, outside the unit circle. Responses are to a one-standard-deviation shock to OPV, about 10 percentage points, with 90% residual-bootstrap bands.

Table 11: Impulse Responses of GDP Growth and Financial Stability to an Oil Price Volatility Shock (H04)

Year after shock	Response of GDPG (percentage points)	Response of FSI (index points)
0	−1.39 (−2.23 to −0.04)	−0.039 (−0.050 to −0.019)
1	−0.63 (−1.35 to 0.41)	−0.032 (−0.044 to −0.008)
2	−0.48 (−0.94 to 0.22)	−0.022 (−0.034 to −0.002)
3	−0.33 (−0.69 to 0.29)	−0.013 (−0.023 to 0.003)
5	−0.11 (−0.38 to 0.26)	−0.004 (−0.011 to 0.008)
10	0.01 (−0.12 to 0.05)	0.000 (−0.004 to 0.002)

Notes: Responses to a one-standard-deviation OPV shock (≈10 percentage points). 90% confidence bands from a residual bootstrap (2,000 replications) in parentheses. VAR(1) in levels with D2004 exogenous. Source: Author's computation.

The financial stability index falls significantly on impact and stays significantly below baseline for two years, then returns to normal by year three. Growth falls on impact (the band just excludes zero) and is not significantly different from zero afterwards.

Variance decompositions depend heavily on the ordering of the variables, because OPV and FSI are strongly correlated within the same year (r = −0.51).

Table 12: Forecast-Error Variance Decomposition of GDPG and FSI Attributable to OPV

Horizon (years)	GDPG variance due to OPV: OPV first	OPV last	FSI variance due to OPV: OPV first	OPV last
1	21.8%	0.0%	73.1%	0.0%
3	26.4%	0.0%	77.1%	0.7%
5	27.5%	0.1%	77.9%	1.1%
10	27.6%	0.1%	78.0%	1.1%

Notes: Percentages of forecast-error variance attributable to OPV under alternative Cholesky orderings. "OPV first" is the theoretically justified ordering for a small open oil-exporting economy that is a price taker. Source: Author's computation.

With OPV ordered first, which is the theoretically justified order for an oil price taker, volatility explains about 28% of the variance of growth and 78% of the variance of financial stability. These are upper bounds, since the full contemporaneous co-movement is assigned to oil. With OPV ordered last the shares fall to nearly zero. The decomposition therefore supports a sizeable contemporaneous link for financial stability but cannot pin down its exact magnitude.

Decision on H04: the null is rejected for financial stability (significant responses for two years). For growth the response is significant on impact only.

Table 13: Diagnostic and Structural-Stability Tests (H05)

Test (p-value unless stated)	Growth model	Stability model	Stability model with crisis dummy
Breusch–Godfrey (2 lags)	0.326	0.490	0.021
Breusch–Pagan	0.713	0.183	0.508
Jarque–Bera	0.836	0.004	0.907
Ramsey RESET	0.078	0.723	0.718
CUSUM	0.520	0.822	0.966
R^2	0.939	0.791	0.912
Durbin–Watson	1.56	2.25	2.79

Notes: Entries are p-values except R^2 and Durbin–Watson. CUSUM entries report the test statistic against 5% bounds. Sup-F (Quandt–Andrews) break test peaks at 3.08 (stability model) and 0.89 (growth model), below the Andrews (1993) 5% critical value of approximately 3.5 for four restricted parameters. Source: Author's computation.

The growth model passes every test. The baseline stability model has non-normal residuals (p = 0.004), which is why robust standard errors are used, and the crisis-dummy version removes the non-normality but shows mild negative serial correlation (p = 0.021). Neither affects the sign or significance of the volatility coefficient, which is robust across all variants. No CUSUM test signals instability.

The sup-F break test peaks in 2011 at 3.08 for the stability model and 0.89 for the growth model, below the conventional Andrews (1993) 5% critical value of roughly 3.5 for four restricted parameters, so no unknown-date break is detected. In the stability model, the interaction between ΔOPV and the crisis years is small and insignificant (+0.0007, p = 0.311), meaning that the marginal effect of volatility is the same in crisis and normal years. The crisis dummy itself is large and significant (−0.076 in the interaction model, p < 0.001): in crisis years the index falls further than volatility alone explains. In the growth model the crisis dummy is −4.08 (p = 0.105), and it absorbs the short-run volatility effect.

Decision on H05: the null of stability is not rejected for the slope coefficients, although crisis years shift the level of the series.

Table 14: Summary of Hypothesis Decisions

Hypothesis	Decision	Key evidence
H01: no effect of OPV on growth	Not rejected on robust evidence	Long-run effect insignificant (p = 0.289); short-run effect (−0.176, p = 0.047) disappears with crisis dummy or credit and reserves controls
H02: no effect of OPV on financial stability	Rejected (short run)	ΔOPV = −0.0024 (p < 0.001), robust in all six variants; no cointegration (F = 1.73)
H03: no causality among the variables	Not rejected	All Toda–Yamamoto p-values above 0.26
H04: no dynamic effect of OPV shocks	Rejected for financial stability	FSI response significant for two years; GDPG response significant on impact only
H05: relationships are stable	Not rejected	CUSUM and sup-F show no break; no OPV × crisis interaction

Notes: All tests evaluated at the 5% significance level. Source: Author's compilation.

Discussion

Financial stability. The robust short-run link agrees with Lawal, Somoye and Babajide (2018) and Adekoya and Oliyide (2021), who find that Nigerian financial markets react strongly to oil volatility. The finding supports the Resource Curse channels, but the evidence points to the fiscal channel more than the exchange-rate channel. The fiscal balance is significant in every stability and NPL equation, while the exchange-rate change is not significant ($p = 0.376$) and inflation never is. The lack of a long-run relationship and the three-year fade-out of impulse responses suggest that Nigerian financial institutions absorb volatility over time, but that each volatility spike imposes a temporary cost.

Economic growth. The growth evidence is weaker than that reported by Alenoghena (2020), Udoh et al. (2023), Mgbomene et al. (2022) and Orji et al. (2023). Three explanations are plausible. First, this study measures volatility, not price shocks or price levels, and volatility peaks coincide with the crisis years, so crisis effects are hard to separate from volatility effects with 26 observations. Second, the growth series is dominated by a rebasing outlier. Third, annual data compress effects that earlier studies measured over longer samples. The same-year impact is, however, consistent with Adesete and Bankole (2020), who report adverse effects within twelve months of a shock.

Fiscal balance. Fiscal balance is the strongest and most consistent variable across models: it raises long-run growth, raises financial stability and reduces non-performing loans. Because oil volatility is negatively associated with the fiscal balance ($r = -0.43$), the fiscal position is a plausible conduit through which oil volatility reaches the economy and the banking system.

Summary, Conclusion and Recommendations

Summary of findings

i. **Financial stability is sensitive to oil price volatility in the short run.** A 10-point rise in volatility lowers the financial stability index by about 0.024 in the same year ($p < 0.001$), about 0.4 of its standard deviation. The result holds in all six alternative specifications. There is no long-run relationship (bounds $F = 1.73$), and impulse responses show the effect lasting about two years.
ii. **The effect on economic growth is weak and not robust.** The baseline short-run coefficient is −0.176 ($p = 0.047$) and the long-run effect is insignificant ($p = 0.289$). The short-run effect is not significant once crisis years or credit and reserves are controlled for.
iii. **Oil volatility does not affect non-performing loans directly** ($p = 0.936$), while the fiscal balance does (−2.33, $p < 0.001$).
iv. **No lagged causality exists among oil volatility, growth and financial stability** (all $p > 0.26$). Transmission is contemporaneous in annual data, and oil volatility is exogenous to Nigeria's economy.
v. **The relationships are stable over 2000–2025.** CUSUM and sup-F tests find no break, and the volatility effect is the same in crisis and non-crisis years, although crisis years lower the level of financial stability by a further 0.07–0.08 points.
vi. **The fiscal balance is the most consistent determinant.** It raises long-run growth, raises financial stability and lowers non-performing loans.

Conclusion

This study examined the effect of oil price volatility on economic growth and financial stability in Nigeria using annual time-series data covering the period 2000–2025. The findings reveal that oil price volatility has a significant negative short-run effect on financial stability, indicating that increased volatility in international crude oil prices weakens the Nigerian financial system. Specifically, a 10-percentage-point increase in oil price volatility reduces the financial stability index by approximately 0.024 points. This effect is statistically significant across the alternative model specifications, demonstrating the robustness of the relationship. However, the absence of a long-run relationship suggests that the adverse effect of oil price volatility on financial stability is temporary rather than permanent. In contrast, the effect on economic growth is relatively weak, as the negative short-run relationship observed in the baseline model becomes insignificant when crisis periods, credit and external reserves are considered. The long-run effect is also statistically insignificant, suggesting that the influence of oil price volatility on economic growth cannot be established independently of broader economic disruptions.

Furthermore, the study establishes that oil price volatility does not significantly explain changes in non-performing loans, suggesting that its effect on financial stability may operate through other dimensions of the financial system. The fiscal balance, however, emerges as a more consistent determinant of economic growth, financial stability and non-performing loans. The Toda–Yamamoto causality results reveal no significant lagged causal relationships among oil price volatility, economic growth and financial stability. Nevertheless, the impulse response analysis demonstrates that financial stability responds negatively to oil price volatility shocks, with the effect remaining significant for approximately two years before gradually diminishing. The structural stability tests also indicate that the estimated relationships are generally stable over the study period, although major crisis episodes contribute to additional deterioration in financial stability. These findings highlight the importance of fiscal conditions in determining the extent to which external oil market disturbances affect the Nigerian economy.

Therefore, the study concludes that oil price volatility remains an important source of short-term financial instability in Nigeria, while its independent effect on economic growth is less conclusive. The findings provide partial support for the Resource Curse Theory, particularly regarding the vulnerability of resource-dependent economies to external commodity market disturbances. They further demonstrate that the strength of domestic fiscal management plays an important role in mitigating the transmission of oil-related shocks into the financial system and the broader economy. Therefore, reducing Nigeria's vulnerability to oil price volatility requires stronger fiscal discipline, adequate stabilisation and external reserves, improved macroprudential supervision, effective coordination of fiscal and monetary policies, and sustained diversification of the economy away from excessive dependence on crude oil revenue.

Policy recommendations

Based on the findings of the study, the following recommendations are proposed:

i. Fiscal buffers: The Nigerian government should strengthen fiscal buffers by establishing and adequately funding a stabilisation or sovereign wealth fund under clear fiscal rules. A conservative benchmark oil price should be adopted in the annual budget to reduce excessive public spending during periods of high oil revenue and prevent fiscal instability when oil prices decline.
ii. Macroprudential supervision: The Central Bank of Nigeria should incorporate oil price volatility scenarios into regular bank stress tests and strengthen countercyclical capital and liquidity buffers to improve the resilience of financial institutions against oil-related economic shocks.
iii. Early warning systems: Relevant monetary and financial regulatory authorities should establish and regularly monitor an oil price volatility and financial stability monitoring framework. This should include clear indicators and early intervention measures to identify and respond promptly to rising oil price volatility.
iv. Policy coordination: The fiscal and monetary authorities should strengthen coordination in the formulation and implementation of economic policies, particularly during periods of oil price instability, to minimise conflicting policy actions and maintain macroeconomic and financial stability.
v. Economic diversification: The Nigerian government should intensify efforts to diversify the economy by promoting non-oil sectors such as agriculture, manufacturing, solid minerals and services. Greater attention should also be given to expanding non-oil revenue sources to reduce excessive dependence on crude oil earnings.

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