IMPACT OF OIL PRICE FLUCTUATIONS ON NIGERIAN ECONOMIC GROWTH AND SECTORAL PERFORMANCE: AN ANALYSIS OF DIVERSIFICATION EFFORTS

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ABSTRACT
This study explores the impact of oil price fluctuations on Nigeria's economic growth and sectoral performance from 1995 to 2024. Employing a Vector Error Correction Model (VECM) and variance decomposition analysis, the study assesses how changes in oil prices impact overall economic growth, the performance of the agricultural and manufacturing sectors, and government revenues. The findings indicate that oil prices have a modest but increasing influence on Nigeria's economic growth, accounting for 2.36% of real GDP variations in the long term. The agricultural sector demonstrates resilience to oil price changes, with a decreasing sensitivity over time. Conversely, the manufacturing sector shows growing vulnerability, with oil prices contributing to 9.49% of output variations by the end of the period. Government revenues are notably affected by oil price fluctuations, particularly in the medium term, where they explain up to 38.17% of variations. These results underscore the complex and varied impacts of oil price shocks on different sectors of the Nigerian economy. The study concludes by advocating for targeted policies to enhance economic diversification, bolster sector-specific resilience, and improve fiscal management to mitigate the effects of oil price volatility on Nigeria's economy.

Keywords: Oil price fluctuations, Economic Growth, Agriculture, Manufacturing, Government Revenues

JEL Classifications: Q43, O13, O14, F43, C32

1. INTRODUCTION
Nigeria, the largest economy in Africa and a major oil producer, has long depended on crude oil exports as the foundation of its economy. Despite ongoing diversification efforts, the petroleum industry remains a cornerstone of the country's economy. The Central Bank of Nigeria (CBN, 2023) and Organization of the Petroleum Exporting Countries (OPEC, 2022) reported that oil exports made up 79.6% of total export earnings in 2022, underscoring the nation's continued dependence on this volatile resource.

The susceptibility of Nigeria's economy to oil price fluctuations has become increasingly apparent in recent years. The COVID-19 pandemic-induced oil price crash in 2020 led to a 1.8% contraction in Nigeria's real GDP (National Bureau of Statistics [NBS], 2021). Conversely, the subsequent recovery in oil prices contributed to a 3.4% GDP growth in 2021 (World Bank, 2023). These fluctuations highlight the importance of understanding how oil price dynamics affect various aspects of Nigeria's economy.

According to recent data from the Food and Agriculture Organization (FAO, 2023), agriculture remains a significant contributor to Nigeria's GDP, accounting for 23.7% in 2022 despite the oil sector's dominance. This indicates potential for economic diversification, though growth in the agricultural sector has been inconsistent, partly due to the "Dutch disease" effect linked to oil dependence (Fasanya, Onakoya & Adabanija, 2013). Recent fiscal challenges further emphasize the urgency of this research. The Nigerian government's oil revenue fell short of targets by 40.6% in the first half of 2023 (Budget Office of the Federation, 2023), raising concerns about the sustainability of oil-dependent fiscal policies and the necessity for alternative revenue sources.

The impetus for this research arises from the ongoing challenges Nigeria faces in managing its oil-dependent economy while pursuing diversification. A study by Raifu and Oloyede (2024) found that oil price shocks accounted for up to 35% of the variance in Nigeria's non-oil sector growth between 2010 and 2022, suggesting a complex relationship between oil prices and diversification efforts. Others explored the relationship between oil prices and economic growth in oil-exporting nations, yielding mixed results (Ftiti et al., 2016; Salisu & Ademuyiwa, 2022). However, Nigeria's distinctive economic structure, which includes a significant non-oil sector, a rapidly growing population, and ongoing diversification initiatives, calls for further investigation.

This research aims to add to the current body of knowledge by offering a detailed analysis of how oil price fluctuations impact Nigerian economic growth and diversification efforts. The study specifically seeks to answer the following research questions: How do variations in global oil prices influence Nigeria's overall economic growth, as indicated by real GDP, what effect do oil price fluctuations have on the performance of agriculture sector, what effect do oil price fluctuations have on the performance of manufacturing sector, to what degree do changes in oil prices impact government revenues? Given that this paper seeks to thoroughly examine how fluctuations in oil prices affect the Nigerian economy, specifically focusing on overall economic growth, assessed through real GDP; the performance of critical non-oil sectors, including agriculture and manufacturing; and government revenues, therefore, the study will utilize time-series analysis and econometric modeling techniques to quantify the relationships between oil price changes and these economic indicators, using data from 1995 to 2024. The study's significance lies in its potential impact on Nigerian policymakers, investors, and stakeholders, as well as its broader implications for understanding economic dynamics in resource-rich nations.

Specifically, it aims to offer empirical evidence on how fluctuations in oil prices affect Nigeria's economic growth and diversification efforts, aiding in policy formulation and strategic planning; provide insights into how the agriculture and manufacturing sectors respond to oil price shocks, identifying areas that may benefit from targeted interventions and support; evaluate the effects of oil price changes on government revenues and budgets, assisting in fiscal planning and resource allocation; and examine how oil price dynamics affect foreign direct investment and employment across sectors, enhancing understanding of their broader economic impacts. By addressing these key areas, the study aims to provide valuable insights

for policymakers, investors, and stakeholders navigating the complex interplay between oil prices and Nigeria's economic development and diversification.

2. LITERATURE REVIEW

2.1 Theoretical Review

Several economic theories provide valuable perspectives on the interplay between natural resource abundance, oil price fluctuations, and economic growth. These theories offer different viewpoints on how countries rich in resources, like Nigeria, might be affected by their dependence on oil exports.

The classical growth theory, developed by economists such as Adam Smith (1776) and David Ricardo (1817), highlights the importance of capital accumulation, labor, and technological progress in promoting economic growth. For oil-exporting countries, this theory suggests that revenues from oil exports could be used to fund productive investments, potentially fostering sustained economic development (Gylfason, 2001).

Endogenous growth theory, introduced by Paul Romer (1986) and Robert Lucas (1988), focuses on the roles of human capital, innovation, and knowledge spillovers in driving long-term economic growth. This theory implies that countries rich in oil could achieve sustainable growth by investing their oil revenues into education, research and development, and technological advancements (Barro & Sala-i-Martin, 2004).

The staple theory of economic growth, initially proposed by Harold Innis (1930) and later expanded by Mel Watkins (1963), examines how exporting natural resources can spur economic growth and development. It posits that exporting a crucial resource like oil can stimulate economic growth by creating linkages with other sectors of the economy (Altman, 2003).

The Dutch Disease theory, introduced by The Economist in 1977 and formally modeled by Corden and Neary (1982), describes how discovering natural resources can negatively impact other economic sectors, particularly manufacturing. This occurs through currency appreciation and a shift of resources towards the booming sector (Corden, 1984).

The Resource Curse theory, popularized by Richard Auty (1993), argues that countries with abundant natural resources often experience slower economic growth compared to countries with fewer resources. This paradox is attributed to factors such as price volatility, the crowding out of other sectors, and institutional weaknesses (Sachs & Warner, 2001).

2.2 Empirical Review

The relationship between oil price changes and economic growth has been widely studied, especially for oil-exporting nations. Theoretical frameworks like the Dutch Disease and Resource Curse suggest negative outcomes from oil price shocks, but empirical results are varied, reflecting the intricate dynamics involved.

Okeke (2024) examines the relationship between oil shocks and stock market performance in Nigeria, Egypt, South Africa, and Tunisia, utilizing data from Q1:2010 to Q4:2020. Using a Panel ARDL approach, the analysis reveals several significant findings. Firstly, oil price shocks negatively impact stock market performance in the long run, emphasizing the vulnerability of these economies to oil price fluctuations. Additionally, a positive long-run relationship is observed between exchange rates and stock market performance, while inflation rate shocks exert a negative effect. The study underscores the importance of prompt adjustments in stock markets and the implementation of proactive policies to mitigate the adverse effects of oil shocks.

In a similar vein, Tyona, Ilemona, and Okwori (2023) conducted an in-depth examination of the return spillover effects between oil prices and sector-specific stock returns on the eleven sectors listed on the Nigeria Exchange Group. The main objective of the study was to uncover these spillover effects. To achieve this, the study employed the constant conditional correlation (CCC) VARMA-GARCH methodology. The findings revealed that returns in both the oil and stock markets exhibit short-term predictability and bi-directional spillover effects between oil prices and sectoral stock returns.

Okereke and Obinna (2022) investigated the relationship between changes in petroleum product prices, exchange rates, and food prices in Nigeria using monthly data from January 2010 to December 2021. The study applied the Augmented Dickey Fuller (ADF) unit root test to assess the stationarity of the variables. Following this, the Autoregressive Distributed Lag (ARDL) model was employed to analyze the data. The ARDL results indicated that both the price of Premium Motor Spirit (PMS) and the exchange rate have a significant positive impact on food prices in Nigeria, both in the short run and the long run.

Akighir and Kpoghul (2020) examined the pass-through effects of oil exports on economic growth in Nigeria, utilizing the framework of a Structural Vector Autoregressive (SVAR) model. Grounded in the Export-Led Growth Model (ELGM) and the macro-prudential theory of accumulated reserves, the study employed annual time series data spanning from 1970 to 2018, which were sourced from the Central Bank of Nigeria (CBN) statistical bulletin. The variables included in the analysis were oil exports, foreign reserves, and Gross Domestic Product (GDP). To explore the relationships among these variables, the study employed Granger causality tests alongside the SVAR model. The findings revealed a significant pass-through effect from oil exports to economic growth via foreign reserves. This effect was further substantiated through impulse response functions and forecast error variance decomposition, confirming the robustness of the established relationships.

Nwosu, Ihugba, and Okonkwo (2019) employed the EGARCH model to extract only the increases in oil price and utilized the conditional volatility measure in a Bayesian Vector Autoregression (BVAR) model. Their analysis was based on monthly data from January 1986 to December 2015, focusing on the industrial production index and selected macroeconomic variables in Nigeria. The results indicated that a shock to oil prices leads to a rise in industrial production, suggesting that positive oil price increases are favorable to output growth in Nigeria.

In broader studies, Ftiti et al. (2016) analyzed 16 OPEC countries from 1980 to 2012, finding that oil price increases positively impacted economic growth in the short term. However, long-term effects were negative, possibly due to Dutch Disease and resource allocation issues. Similarly, Mohaddes and Pesaran (2017) observed that while initial oil price hikes spurred growth in oil-exporting countries, the benefits waned over time due to currency appreciation and reduced competitiveness in non-oil sectors.

Mehrara and Oskoui (2007) analyzed a panel of 13 oil-exporting countries and discovered that oil price fluctuations are positively linked to economic growth in the short term but negatively associated in the long term. Their findings emphasize the risk of Dutch Disease and the need for diversification strategies. In contrast, Guo et al. (2020) studied 30 oil-exporting countries and discovered that increases in oil prices had a positive effect on economic growth, both in the short and long term. However, the impact differed among countries, with economies heavily reliant on oil experiencing more significant positive effects.

In country-specific studies, research focusing on individual oil-exporting countries has produced varied outcomes. In Nigeria, for instance, Salisu and Ademuyiwa (2022) used a

wavelet-based method to show a positive short- and medium-term relationship between oil prices and growth. However, they noted a long-term negative correlation, likely due to Dutch Disease. Balcilar et al. (2019) found an asymmetric relationship, where positive oil price shocks hindered growth, whereas negative shocks were beneficial.

In the Gulf Cooperation Council (GCC) Countries, Bassam and Fattouh (2019) analyzed the economies of the GCC and discovered that oil price fluctuations have a significant positive impact on economic growth in the short term. However, they emphasized the need for diversification strategies to mitigate the long-term risks associated with oil price volatility. Similarly, Hasanov et al. (2017) found a positive correlation between oil price changes and economic growth in the GCC region but also noted the potential for Dutch Disease effects in the long run.

In Russia, Idrisov et al. (2015) analyzed the effects of oil price fluctuations on the Russian economy and discovered that oil price increases significantly boost economic growth. This is largely due to increased government revenues and domestic demand. However, the study also highlighted the potential risks of Dutch Disease and the importance of diversifying the economy.

In Venezuela, Mendoza and Vera (2010) studied the Venezuelan economy and discovered that sudden increases in oil prices initially boosted economic growth but ultimately had a negative impact due to the challenges of managing resources and the Dutch Disease phenomenon.

However, several studies have examined the potential non-linear and asymmetric effects of oil price shocks on economic growth. For instance, Ogundipe et al. (2014) discovered that in Nigeria, positive oil price shocks had a negative impact on growth, whereas negative shocks had a positive effect. This asymmetry could be attributed to factors such as adjustment costs, resource reallocation challenges, and the Dutch Disease effects. Similarly, Shi et al. (2020) found that oil price shocks have non-linear effects on economic growth in oil-exporting countries, with the impact varying depending on the magnitude and direction of the shocks.

In summary, empirical research on the relationship between oil price shocks and economic growth in oil-exporting countries has produced mixed results. Some studies find a positive impact, mainly in the short term, while others suggest negative effects in the long term, possibly due to Dutch Disease, resource movement challenges, and the need for diversification. Furthermore, studies have also examined asymmetric and nonlinear effects, highlighting the intricate dynamics involved. Despite the extensive research, there remains a gap in understanding the specific conditions under which oil price shocks may lead to beneficial versus detrimental outcomes for economic growth, particularly in relation to policy responses and economic diversification efforts.

3. METHODOLOGY

3.1 Theoretical Framework

In evaluating the theories above, the Dutch Disease and Resource Curse theories emerge as the most pertinent for understanding the dynamics in oil-exporting countries like Nigeria. They provide a comprehensive explanation of the challenges faced and offer insights into the effects of oil price fluctuations on economic growth and diversification strategies.

The Dutch Disease theory sheds light on how oil price fluctuations can impact various sectors of the Nigerian economy. It suggests that high oil prices can lead to an appreciation of the real exchange rate, potentially undermining the competitiveness of non-oil sectors such as

agriculture and manufacturing (Corden & Neary, 1982). This theory is particularly relevant for addressing questions about sectoral performance and economic impacts.

Complementing the Dutch Disease theory, the Resource Curse theory highlights broader economic and institutional challenges experienced by resource-rich nations. It provides a framework for understanding how volatility in oil prices affects government revenues, economic growth, and the implementation of effective diversification strategies (Auty, 1993; Sachs & Warner, 2001).

Together, these theories offer a robust foundation for analyzing the complex relationships between oil price fluctuations, economic growth, and diversification efforts in Nigeria.

3.2 Data Sources and Description

This study used time-series data from multiple sources to analyze the effect of oil price changes on Nigeria's economic growth and diversification initiatives for the period between 1995 to 2024. Oil Price Data proxied by Global oil prices, such as Brent Crude benchmark, was acquired from credible sources like the U.S. Energy Information Administration (EIA) and the Organization of the Petroleum Exporting Countries (OPEC); Nigeria's GDP and Sectoral Output Data proxied by Real GDP and sectoral output data for agriculture and manufacturing were obtained from the National Bureau of Statistics (NBS) of Nigeria and CBN Statistical Bulletins of 2024; Government Revenue Data including oil and non-oil revenues, were sourced from the Central Bank of Nigeria (CBN) statistical bulletins of 2024.

3.3 Analytical Approach

The Unit Root Tests was carried out to determine the stationarity properties of the time-series variables, using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The Cointegration analysis was also carried out to identify long-run equilibrium relationships among the variables using the Johansen cointegration test, as well as the Lag Length analysis. To achieve the objectives of the study, the Vector Error Correction Model (VECM) through its Variance Decomposition analysis was estimated to capture both the short-run and long-run shocks or effect responses between oil prices and the economic indicators of interest.

3.4 Method of Data Analysis and Econometric Modelling

To meet the study's objectives, the Vector Error Correction Model (VECM) was used to estimate the data and variables. This model analyzes the impact of oil price fluctuations on Nigeria's economic growth and sectoral performance, while also considering potential long-term equilibrium relationships among the variables. The VECM model facilitates the examination of both short-term and long-term relationships between changes in oil prices and real GDP growth, sectoral output growth, and government revenue growth.

The VECM model as given by Lütkepohl (2005) can be expressed as follows:

$$\Delta y_t = \alpha + \prod y_{t-1} + \sum(i = 1\ to\ p-1)\ \Gamma i \Delta y_{t-i} + \beta \Delta X_t + \varepsilon_t \quad \ldots\ldots[1]$$

Where: y_t is a vector of endogenous variables, X_t is a vector of exogenous variables, α is a vector of constant terms, Π is the long-run cointegrating matrix, capturing the long-term equilibrium relationships among the variables, Γi are the coefficient matrices that capture the short-term dynamics of the model, β represents the coefficients linked to the exogenous variables, ε_t is the vector of error terms. The long-run cointegrating matrix, Π, can be broken down into $\Pi = \alpha\beta'$, where α denotes the adjustment coefficients indicating the rate at which the system adjusts to return to long-run equilibrium, and β' holds the cointegrating vectors representing the long-term equilibrium relationships (Johansen, 1991).

Given the model in Equation [1], therefore, the VECM model for the study is presented in its functional form as in the following Equations:

$$RGDP = f(OLP, AGO, MANU, GREV) \quad \text{[2]}$$

$$AGO = f(OLP, RGDP, MANU, GREV) \quad \text{[3]}$$

$$MANU = f(OLP, RGDP, AGO, GREV) \quad \text{[4]}$$

$$GREV = f(OLP, RGDP, AGO, MANU) \quad \text{[5]}$$

Where: OLP is the percentage change in Brent crude oil prices, RGDP is the real GDP growth rate, indicating overall economic growth, AGO is the growth rate of agricultural output, MANU is the growth rate of manufacturing output, GREV is the growth rate of government revenues, both oil and non-oil.

Therefore, VECM Equations [2], [3], [4], and [5] can be expressed as a system of equations as follows:

$$\Delta RGDP = \alpha_1 + \prod_{11}\big(RGDP(-1)\big) + \prod_{12}\big(AGO(-1)\big) + \prod_{13}\big(MANU(-1)\big) + \prod_{14}\big(GREV(-1)\big) + \sum(i = 1\ to\ p-1)\Gamma_{1i}\Delta y_{t-1} + \beta_1 \Delta OLP + \varepsilon_{1t} \quad \text{[6]}$$

$$\Delta AGO = \alpha_2 + \prod_{21}\big(RGDP(-1)\big) + \prod_{22}\big(AGO(-1)\big) + \prod_{23}\big(MANU(-1)\big) + \prod_{24}\big(GREV(-1)\big) + \sum(i = 1\ to\ p-1)\Gamma_{2i}\Delta y_{t-1} + \beta_2 \Delta OLP + \varepsilon_{2t} \quad \text{[7]}$$

$$\Delta MANU = \alpha_3 + \prod_{31}\big(RGDP(-1)\big) + \prod_{32}\big(AGO(-1)\big) + \prod_{33}\big(MANU(-1)\big) + \prod_{34}\big(GREV(-1)\big) + \sum(i = 1\ to\ p-1)\Gamma_{3i}\Delta y_{t-1} + \beta_3 \Delta OLP + \varepsilon_{3t} \quad \text{[8]}$$

$$\Delta GREV = \alpha_4 + \prod_{41}\big(RGDP(-1)\big) + \prod_{42}\big(AGO(-1)\big) + \prod_{43}\big(MANU(-1)\big) + \prod_{44}\big(GREV(-1)\big) + \sum(i = 1\ to\ p-1)\Gamma_{4i}\Delta y_{t-1} + \beta_4 \Delta OLP + \varepsilon_{4t} \quad \text{[9]}$$

In this VECM specification, the long-run cointegrating relationships among the variables are captured by the cointegrating matrix Π; the short-run dynamics are captured by the coefficient matrices Γ*i*; the coefficients β*i* measure the impact of oil price changes on the respective endogenous variables in the short run.

The VECM enables analysis of both short-run and long-run relationships between oil price changes and the endogenous variables of interest (real GDP growth, sectoral output growth, and government revenue growth), while accounting for potential long-run equilibrium relationships among the variables.

3.5 Diagnostic Tests and Robustness Checks

Throughout the analysis, multiple diagnostic tests were conducted to confirm the validity and robustness of the findings. These tests encompass the residual diagnostics which is meant for the assessments for serial correlation, stability and normality of residuals. The test utilized the VEC Residual Serial Correlation LM Tests (Breusch, 1978; Godfrey, 1978) for serial correlation, Jarque-Bera Test (Jarque & Bera, 1987) for normality of residuals, and CUSUM Test and CUSUM of Squares Test (Brown et al., 1975) for stability.

4 RESULTS AND DISCUSSION OF FINDINGS

4.1 Unit Root Test Result

Table 1: Augmented Dickey-Fuller Unit Root Test Result

Variable	Order of Stationarity	ADF Calculated	ADF Critical Value	Order of Integration	Decision
RGDP	At level	-2.896558	-2.991878	1(0)	Non-stationary
	1st difference	-4.331862	-3.622033	1(1)	Stationary
OLP	At level	-2.260646	-2.991878	1(0)	Non-stationary
	1st difference	-5.504705	-2.998064	1(1)	Stationary
AGO	At level	-2.882873	-2.991878	1(0)	Non-Stationary
	1st difference	-5.164070	-3.004861	1(1)	Stationary
MANU	At level	-1.021423	-2.998064	1(0)	Non-stationary
	1st difference	-2.640620	-1.956406	1(1)	Stationary
GREV	At level	-1.481770	-2.991878	1(0)	Non-Stationary
	1st difference	-4.859402	-2.998064	1(1)	Stationary

Computed at 5% ADF critical value

Table 2: Phillips-Perron (PP) Unit Root Test Result

Variable	Order of Stationarity	PP Calculated	PP Critical Value	Order of Integration	Decision
RGDP	At level	-2.896558	-2.991878	1(0)	Non-stationary
	1st difference	-4.329625	-3.622033	1(1)	Stationary
OLP	At level	-2.260646	-2.991878	1(0)	Non-stationary
	1st difference	-5.504572	-2.998064	1(1)	Stationary
AGO	At level	-0.816671	-3.612199	1(0)	Non-Stationary
	1st difference	-4.840395	-2.998064	1(1)	Stationary
MANU	At level	-0.790482	-2.991878	1(0)	Non-stationary
	1st difference	-2.640620	-1.956406	1(1)	Stationary
GREV	At level	-1.210869	-2.991878	1(0)	Non-Stationary
	1st difference	-6.224521	-2.998064	1(1)	Stationary

Computed at 5% PP critical value

Both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests in Table 1 and Table 2 reveal that all variables (RGDP, OLP, AGO, MANU, and GREV) are non-stationary at their levels, but achieve stationarity after first differencing. This suggests that all variables are integrated of order one, I(1), making them appropriate for Vector Error Correction Model (VECM) analysis.

4.2 VECM Lag Length Result

Table 3: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-947.3166	NA	2.01e+28	79.35971	79.60514	79.42483
1	-823.4218	185.8422*	5.59e+24*	71.11848*	72.59105*	71.50915*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

The result in Table 3 shows that the VAR Lag Order Selection Criteria all consistently recommend using 1 lag, as shown by every information criterion (LR, FPE, AIC, SC, and HQ).

4.3 Co-Integration Test Result

Table 4: Johansen Co-Integration Test Result

No. of CE(S)	Trace Stat.	0.05% CV	No. of CE(S)	Max-Eigen Stat.	0.05% CV
None *	155.2583	69.81889	None *	61.05932	33.87687
At most 1 *	94.19897	47.85613	At most 1 *	43.10189	27.58434
At most 2 *	51.09708	29.79707	At most 2 *	21.73857	21.13162
At most 3 *	29.35852	15.49471	At most 3 *	20.98432	14.26460
At most 4 *	8.374192	3.841466	At most 4 *	8.374192	3.841466

**denotes rejection of the hypothesis at the 5%*

The findings from Table 4 reveal that both the trace test statistics and max-eigen statistics point to the presence of 5 co-integrating equations at the 5 percent significance level. Based on these tests, it is concluded that there is a long-term relationship among the variables in the VECM model.

4.4 VECM Variance Decomposition Test

Research Question One: How do variations in global oil prices influence Nigeria's overall economic growth, as indicated by real GDP?

Table 5: Results of Variance Decomposition Analysis of Economic Growth (*RGDP*)

Period	S.E.	RGDP	OLP	AGO	MANU	GREV
1	3422.050	100.0000	0.000000	0.000000	0.000000	0.000000
2	4930.045	98.91663	0.039771	0.783358	0.029850	0.230395
3	5973.053	96.37637	0.132896	2.748958	0.578981	0.162790
4	6993.660	92.65406	0.797671	4.708601	1.001682	0.837991
5	7901.511	89.52387	2.274701	6.053525	1.267660	0.880239
6	8910.849	88.76927	2.215373	7.222117	1.073000	0.720236
7	9862.264	89.20040	2.089841	7.170968	0.914175	0.624618
8	10737.06	89.20577	2.160800	7.099643	0.934563	0.599223
9	11503.29	88.80154	2.260047	7.399910	0.945514	0.592990
10	12189.62	88.46512	2.357122	7.644536	0.929721	0.603498

From Table 5, the variance decomposition of real GDP (RGDP) reveals that oil prices (OLP) have a minor but progressively growing impact on Nigeria's economic growth over time. Initially, in the short term (period 1), OLP accounts for 0% of the variations in RGDP. By period 5, this influence rises to 2.27%, and in the long term (period 10), OLP explains 2.36% of RGDP variations. This indicates that although global oil price changes do affect Nigeria's overall economic growth, their impact is relatively modest when compared to other factors.

Research Question Two: What effect do oil price fluctuations have on the performance of agriculture sector?

Table 6: Results of Variance Decomposition Analysis of Agricultural Output (*AGO*)

Period	S.E.	RGDP	OLP	AGO	MANU	GREV
1	1097.014	91.32349	3.357256	5.319253	0.000000	0.000000
2	1540.895	92.23480	2.043272	5.308334	0.002292	0.411304
3	1652.029	89.78535	1.858277	5.025732	1.963244	1.367398
4	1763.043	87.62681	1.638228	4.691113	3.449176	2.594677
5	1878.014	87.05844	1.536591	4.686595	4.125035	2.593343
6	2071.533	88.01325	1.273005	4.512387	3.888507	2.312855
7	2274.002	89.14239	1.063930	3.903887	3.605218	2.284572
8	2448.598	89.41319	0.993013	3.466466	3.670335	2.456997
9	2592.704	89.53045	0.918124	3.244860	3.677979	2.628584
10	2719.321	89.71677	0.853026	3.060563	3.682574	2.687071

From Table 6, the variance decomposition of AGO shows that oil price changes have a minimal and decreasing impact on the agricultural sector's performance. Initially (period 1), oil price fluctuations account for 3.36% of the variations in AGO. However, this influence lessens over time, dropping to just 0.85% by period 10. This indicates that, in the long run, the agricultural sector's performance is not greatly affected by changes in oil prices.

Research Question Three: What effect do oil price fluctuations have on the performance of manufacturing sector?

Table 7: Results of Variance Decomposition Analysis of Manufacturing Output (*MANU*)

Period	S.E.	RGDP	OLP	AGO	MANU	GREV
1	242.1202	12.53721	0.232398	25.85544	61.37496	0.000000
2	493.8102	11.19692	1.717212	53.75510	33.18382	0.146938
3	722.3712	8.434636	5.762280	59.36491	25.63063	0.807535
4	943.9278	13.70928	7.768412	56.40702	19.68052	2.434766
5	1120.802	18.50531	10.05560	52.61549	16.51100	2.312598
6	1276.480	23.69997	9.447760	50.69138	14.21414	1.946751
7	1405.854	26.94843	8.980357	49.13244	13.04968	1.889090
8	1527.545	27.82385	9.253782	48.09240	12.87350	1.956468
9	1645.604	27.91269	9.382812	48.19381	12.53754	1.973155
10	1752.571	28.19628	9.485615	48.23202	12.11079	1.975282

From Table7, the variance decomposition of MANU shows that the impact of oil price fluctuations on the performance of the manufacturing sector increases over time. Initially, in the short run (period 1), oil prices account for only 0.23% of the variations in MANU. However, this influence grows significantly, reaching 10.06% by period 5 and stabilizing around 9.49% by period 10. This suggests that oil price fluctuations have a moderate but increasing effect on the manufacturing sector's performance in the long run.

Research Question Four: To what degree do changes in oil prices impact government revenues?

Table 8: Results of Variance Decomposition Analysis of Government Revenues (*GREV*)

Period	S.E.	RGDP	OLP	AGO	MANU	GREV
1	1127.548	46.02502	11.33203	0.003856	14.67458	27.96452
2	1879.280	42.15958	38.17174	0.493448	6.548571	12.62666
3	2326.471	50.21510	28.77259	1.795573	5.837083	13.37965
4	2808.899	42.18001	23.18401	14.38371	4.574679	15.67759
5	3038.298	39.01655	22.66405	20.07358	3.987335	14.25848

6	3112.233	39.54041	21.65393	21.20877	3.936627	13.66026
7	3241.038	38.38456	20.58300	23.26164	3.635198	14.13560
8	3430.902	36.18733	21.17329	23.90520	3.460029	15.27415
9	3554.611	35.31468	22.00643	24.23388	3.223997	15.22101
10	3680.934	35.35556	21.21763	25.19697	3.181012	15.04883

From Table 8, the variance decomposition of GREV reveals that fluctuations in oil prices significantly affect government revenues, particularly in the medium term. In the short term (period 1), oil prices (OLP) account for 11.33% of the variations in GREV. This influence increases sharply to 38.17% by period 2, highlighting a strong effect in the short-to-medium term. In the long run (period 10), the impact of oil prices stabilizes at approximately 21.22% of GREV variations. This indicates that changes in oil prices are a crucial factor in determining government revenues, especially in the medium term, with a lasting effect in the long run.

4.5 Autocorrelation Test

Table 9: VEC Residual Serial Correlation LM Tests Result

Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	21.27052	25	0.6774	0.787080	(25, 23.8)	0.7218

Null hypothesis: No serial correlation at lags 1 to h

Lag	LRE* stat	Df	Prob.	Rao F-stat	Df	Prob.
1	21.27052	25	0.6774	0.787080	(25, 23.8)	0.7218

From Table 9, the VEC Residual Serial Correlation LM Test indicates an absence of serial correlation at lag 1, as the p-value of 0.7218 exceeds the threshold of 0.05.

4.6 Normality Test

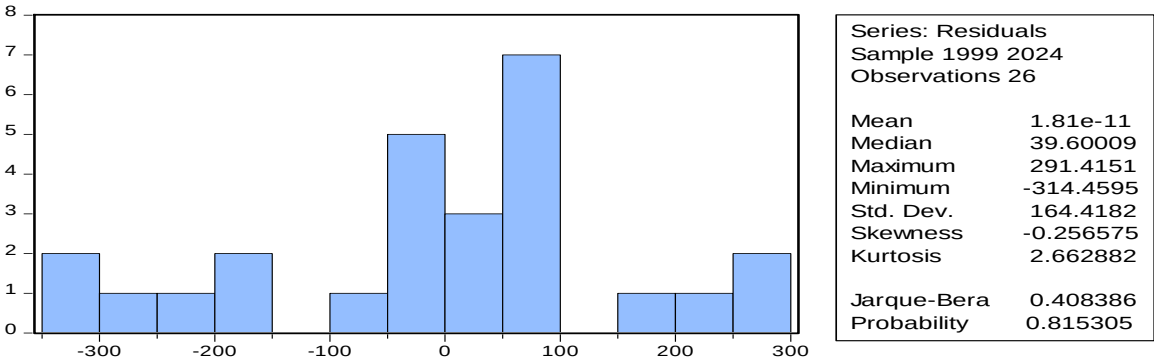

Figure 1: Jarque-Bera Normality Test Result

The findings in Figure 1 indicate that the skewness and kurtosis align with those of a normal distribution, displaying a skewness of 0 and a kurtosis around 2. Therefore, the model satisfies the criteria for the normality test.

4.7 Stability Test

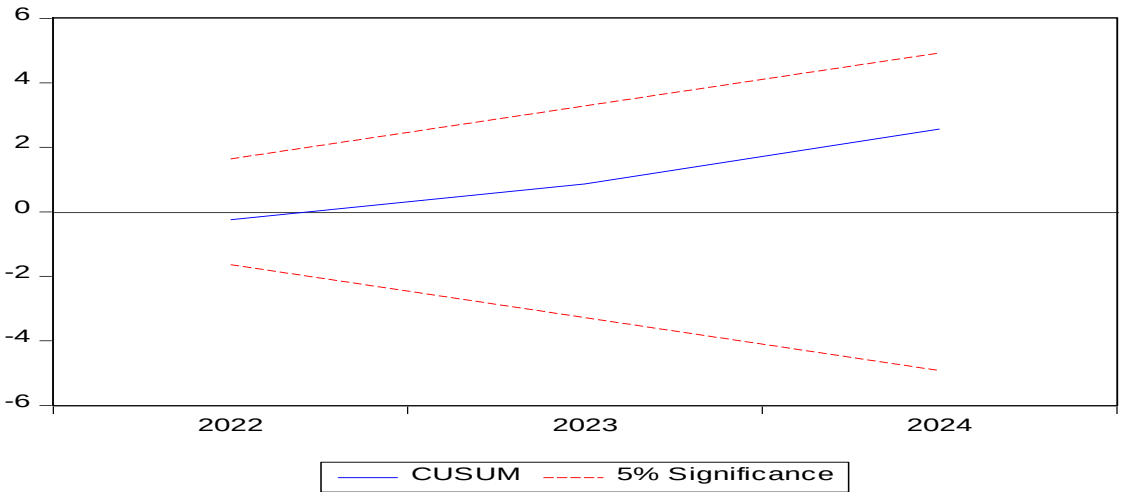

Figure 2: CUSUM Test Result

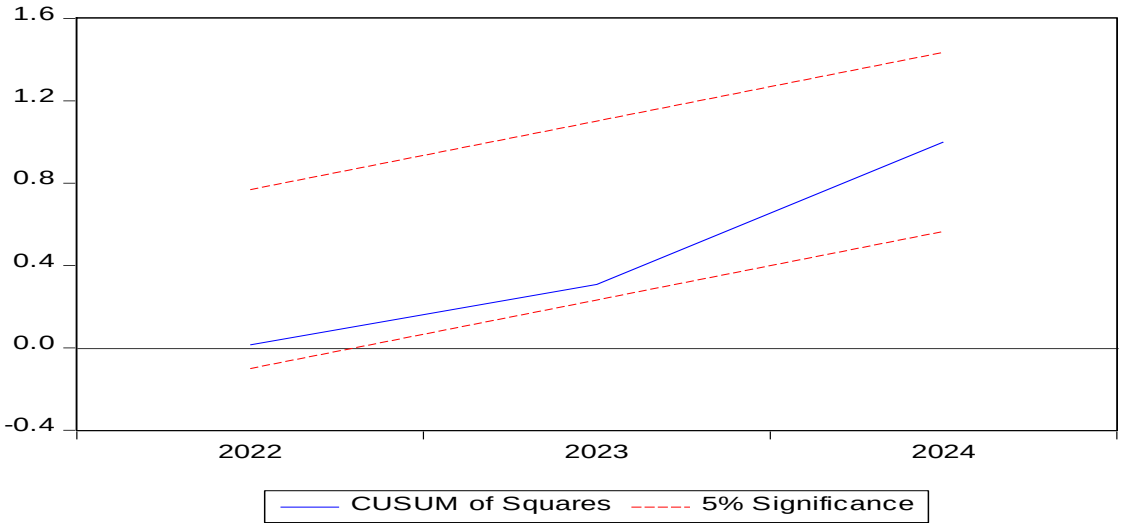

Figure 3: CUSUM of Squares Test Result

From Figure 2 and Figure 3, the CUSUM and CUSUM of Squares tests indicate model stability, with the blue lines staying within the 5% significance limits (red lines) throughout the entire sample period.

4.8 Discussion of Results

The analysis using VECM variance decomposition provides valuable insights into how oil price fluctuations impact Nigerian economic growth and diversification efforts. These results can be understood in the context of existing research on countries that heavily rely on oil exports.

Our findings suggest that changes in global oil prices have a modest but growing impact on Nigeria's economic growth, explaining 2.36% of RGDP variations in the long run. This result aligns with previous studies that have highlighted the complex relationship between oil prices and economic growth. For example, Ftiti et al. (2016) noted a positive short-term impact of oil price increases on economic growth in OPEC countries, which turned negative over the long term. Similarly, Mohaddes and Pesaran (2017) found initial growth benefits from higher oil prices in oil-exporting countries, which diminished over time.

The relatively minor impact we observe could be interpreted in light of Salisu and Ademuyiwa's (2022) research on Nigeria, which showed a positive short- and medium-term relationship between oil prices and growth, but a negative long-term correlation. This suggests that Nigeria's economy might have developed some resilience to oil price fluctuations, possibly due to diversification efforts or other economic factors.

Our analysis indicates that fluctuations in oil prices have a minimal and declining effect on the performance of Nigeria's agricultural sector. This finding is noteworthy in the context of the Dutch Disease phenomenon discussed in the literature. While some studies, such as Mehrara and Oskoui (2007), highlight the risk of Dutch Disease in oil-exporting countries, our results suggest that Nigeria's agricultural sector may be somewhat insulated from these effects. This could indicate effective sector-specific policies or the relative independence of the agricultural sector from oil price dynamics.

In contrast, our study shows a more significant response of the manufacturing sector to oil price fluctuations. This finding is consistent with the broader literature on the resource curse and Dutch Disease effects. For example, Mohaddes and Pesaran (2017) observed reduced competitiveness in non-oil sectors due to currency appreciation following oil price increases. The increasing sensitivity of Nigeria's manufacturing sector to oil prices over time, as observed in our study, could be seen as a manifestation of these effects.

Our analysis demonstrates that changes in oil prices have a substantial impact on government revenues, particularly in the medium term. This finding is in line with observations in other oil-exporting nations. Bassam and Fattouh (2019), for instance, found that oil price fluctuations significantly affect economic growth in GCC countries in the short term, mainly through government revenue channels. Similarly, Idrisov et al. (2015) noted that higher oil prices stimulate economic growth in Russia primarily by increasing government revenues.

The significant medium-term effect we observe underscores the immediate sensitivity of government finances to oil price fluctuations, while the sustained long-term impact highlights Nigeria's persistent dependence on oil revenues for fiscal policy. This aligns with the broader literature that emphasizes the challenges of managing resources in oil-exporting countries.

Our findings also hint at the possibility of non-linear and asymmetric effects of oil price shocks, as discussed by Ogundipe et al. (2014) and Shi et al. (2020). Although our analysis does not directly measure these effects, the varied impacts across sectors and time periods suggest complex dynamics at play.

5 CONCLUSION AND POLICY RECOMMENDATIONS

5.1 Conclusion

This study investigated how fluctuations in oil prices affect Nigeria's economic growth and diversification efforts. The results show that there is a nuanced relationship between oil prices and different sectors of the Nigerian economy. While changes in oil prices have a moderate but increasing impact on overall economic growth, their effects vary significantly across sectors and over time. The agricultural sector appears to be resilient to oil price fluctuations, indicating some success in protecting this crucial sector from the volatility of the oil market. On the other hand, the manufacturing sector shows a growing sensitivity to oil price changes, which could suggest vulnerability to Dutch Disease effects. Government revenues are strongly affected by changes in oil prices, especially in the medium term, highlighting Nigeria's continued reliance on oil-related income for fiscal policy. This underscores the challenges the country faces in diversifying its economy and managing its resources. The diverse impacts across sectors and

timeframes suggest that the effects of oil price shocks on the Nigerian economy are complex, potentially non-linear, and asymmetric. These findings underscore the importance of nuanced, sector-specific policies to address the impacts of oil price volatility and promote sustainable economic growth.

5.2 Policy Recommendations

Based on the findings revealed from the analysis, the study therefore recommends the followings:

1. In addressing the effects of fluctuating oil prices on economic growth in Nigeria, government should implement a diversification strategy focused on developing non-oil sectors to reduce the economy's sensitivity to oil price fluctuations. An economic stabilization fund should also be established to mitigate the impact of oil price volatility on overall economic growth. Develop policies to enhance the linkages between the oil sector and other sectors of the economy to spread the benefits and risks more evenly.
2. In enhancing the agricultural sector's ability to withstand oil price volatility in Nigeria, government should reinforce existing policies that have contributed to the agricultural sector's resilience against oil price shocks. Increase investment in agricultural technology and infrastructure to further enhance productivity and reduce any remaining sensitivity to oil price changes. Develop programs to promote value addition in agriculture, strengthening its position as a stable contributor to economic growth.
3. To mitigate the manufacturing sector's susceptibility to oil price fluctuations in Nigeria, targeted policies should be implemented to enhance the competitiveness of the manufacturing sector, particularly in non-oil related industries. Incentives for manufacturers should be provided to adopt energy-efficient technologies and practices to reduce their vulnerability to oil price volatility. Develop programs to support local sourcing of inputs and reduce dependence on imported materials that may be affected by oil-induced exchange rate fluctuations.
4. In order to manage the impact of oil price changes on government revenues in Nigeria, the revenue sources should be diversified by expanding the non-oil tax base and improving tax collection efficiency. A fiscal rule should be implemented that ties government expenditure to long-term oil price trends rather than short-term fluctuations. Government should also strengthen the management of the sovereign wealth fund to better handle oil windfalls and provide fiscal buffers during periods of low oil prices. Develop and implement a medium-term expenditure framework that accounts for potential oil price volatility.
5. Overall, the Nigerian government and policy makers should establish a comprehensive economic monitoring system to track and analyze the real-time impacts of oil price changes on different sectors of the economy. A strong coordination between fiscal and monetary policies should be enhanced to effectively manage the macroeconomic impacts of oil price fluctuations. Government should also invest in research and development to foster innovation in non-oil sectors, enhancing their productivity and reducing the economy's overall dependence on oil. Implement capacity building programs to develop the skills needed for a more diversified economy, focusing on sectors that show resilience to oil price shocks.

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