Harnessing Oil Sector Gains for Poverty Alleviation: An Investigation of The Link Between Oil Sector Performance and Poverty Incidence in Nigeria

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Abstract- With vast oil reserves and substantial oil sector revenue, it is no surprise that Nigeria is a major oil-producing nation. However, despite its considerable oil wealth, Nigeria continues to grapple with poverty and inequality, with more than half of the population living below the poverty line. This puzzling discrepancy between Nigeria's oil sector gains and its persistent poverty highlights the complex relationship between resource abundance and poverty reduction. This study examines the intricate dynamic relationship between oil sector performance and poverty incidence in Nigeria, spanning a period from 1980 to 2025. By employing a diverse range of economic indicators, including real GDP, gross fixed capital formation, oil revenue, oil output, government expenditure, and institutional quality, the study determined the order of integration of variables using Phillips–Perron unit root and KPSS tests. Further analysis using VAR and ARDL bounds test revealed insights into the response of poverty incidence to oil sector performance and short-run and long-run relationships. The study found that increases in oil revenue produced a positive yet insignificant impact on poverty, while oil sector output produced a negative and significant impact. Institutional quality, represented by the corruption perception index, also produced a negative impact but was statistically insignificant. Based on these findings, the study recommended reinvesting oil revenue in productive sectors, such as agriculture and manufacturing, to create jobs and reduce unemployment. It also suggested facilitating regulatory collaborations between institutions to maximize the benefits from oil sector revenue and mitigate systemic leakages, in pursuit of sustainable development and poverty reduction in Nigeria.

Keywords: Oil Sector Performance, Vector Autoregressive (VAR), Auto-Regressive Distributed Lag (ARDL), Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test and Poverty Incidence

I. BACKGROUND TO THE STUDY

The Nigerian economy is on the road to recovery following a recent GDP rebasing that revealed a national output of ₦372.8 trillion and growth of 3.13% in Q1 2025, largely fueled by the services sector, which now contributes more than 50% of GDP, driven by trade, information and communication, and real estate. While agriculture once dominated the economy, it now accounts for around 23% of GDP, with Oil & Gas contributing a smaller portion despite its significance in exports. The Nigerian economy is heavily reliant on oil, which contributes 70% of government revenue and 90% of foreign exchange earnings (CBN, 2025). Despite its pervasive influence, Nigeria's reliance on oil has not translated into widespread economic growth and prosperity. The country continues to face significant challenges, such as high inflation, high cost of living, poverty, inequality, widening fiscal deficit and underdevelopment. The prominence of oil in the global economy and its impact on politics and diplomacy cannot be overlooked. However, Nigeria's experience highlights the need for a balanced approach to economic development, where multiple sectors contribute to growth and sustainability.

The incorporation of the Nigerian National Petroleum Corporation (NNPC) as a limited liability company in 2019 represented a significant step towards transforming and modernizing the country's oil and gas sector. This move, mandated by the Petroleum Industry Act (PIA), was aimed at promoting transparency through independent audits and revenue disclosure. Nigeria's oil sector has also experienced recent discoveries in deep offshore and ultra-deep regions, which could boost production and revenues in the long run. Furthermore, the commencement of refining and distribution by Dangote Refinery in 2023 holds the potential to increase domestic production, job creation, and foreign exchange savings. These developments provide a glimmer of hope for Nigeria's oil sector, signaling a shift towards greater transparency, diversification, and efficiency in the industry. Even

with these positive steps, continued efforts are needed to ensure that the benefits of the oil sector are equally distributed among Nigerians, to reduce poverty and inequality, and to foster sustainable economic development.

Nigeria's abundant natural resources have failed to translate into widespread economic prosperity, with a poverty rate of around 40% and 63% of persons living within Nigeria (133 million people) are multidimensionally poor indicating a "paradox of plenty" (Ekpo, 2022; World bank, 2023). Despite being a major oil producer, Nigeria has been plagued by issues such as corruption, theft, conflict, unequal distribution of oil revenue, and the Dutch Disease effect, which has hindered economic growth and diversification, exacerbating poverty and inequality. In response, efforts have been made to redistribute oil revenue, such as through the Niger Delta Development Commission, Presidential Amnesty Program, and the Derivation Principle, but the challenge of reconciling oil sector performance with poverty reduction in Nigeria remains elusive as poverty and inequality remain persistent issues (Opaleye, 2018).

In light of Nigeria's persistent poverty and its status as a major oil producer, this study seeks to provide a comprehensive understanding of the relationship between oil sector performance and poverty incidence in the country. The overarching question to be addressed is the extent to which the performance of the oil sector has contributed to poverty reduction in Nigeria. By utilizing the VAR and ARDL bounds test, this study aims to uncover the impact of the oil sector on poverty reduction and offer valuable insights into policy formulation and intervention strategies that can effectively leverage the potential of the sector to alleviate poverty in Nigeria, thereby expanding the existing literature on this topic

II.   REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework
2.1.1   Oil Revenue
In oil-dominated economies such as Nigeria, oil revenue constitutes a significant proportion of government revenues, driving fiscal processes and shaping economic planning. Oil revenue, a form of natural resource rent, represents the income earned from the extraction and sale of oil, including crude oil and its by-products. However, dependence on resource rents can pose a danger to an economy through the liquidation of capital, resulting in short-term gains at the expense of long-term sustainability (Imandojemu and Akinlosotu 2018). The economic significance of oil revenue in Nigeria is not only limited to government revenues but also extends to foreign exchange earnings and overall economic growth. The potential benefits of oil revenue are widely recognized, including its ability to boost fiscal policies and stimulate growth. However, harnessing the full potential of oil rents requires a nuanced understanding of the complex interplay between oil production, prices, revenues, and economic factors. The pitfalls of dependence on oil revenue, such as the Dutch Disease effect and rent-seeking behavior, highlight the importance of diversifying the economy and promoting economic resilience to mitigate against potential negative consequences.

2.1.2   Poverty
Poverty, in its essence, epitomizes the deprivation of fundamental human needs and remains the quintessential challenge of underdevelopment. Encompassing necessities such as nourishment, clothing, shelter, clean water, and health services, poverty is a multidimensional, dynamic phenomenon that defies simple measurement. Various metrics are employed to gauge poverty, including the Deninger database, Gini coefficient, and annual per capita income, with the Private Per Capita Consumption index (PPC) commonly utilized as a proxy for poverty measurement in Africa. Despite being endowed with substantial natural resources, Nigeria has been plagued by persistent poverty and inequality, a paradox that has confounded scholars and policymakers alike. The country's inability to translate its vast wealth into socio-economic improvement is a pressing concern, requiring a more profound understanding of the relationship between oil sector performance and poverty alleviation (Folami, 2017).

2.2   Theoretical Literature
2.2.1 The Rentier State Theory, developed by Michael L. Ross 2001.
The theory proposes that countries with abundant natural resource wealth can become rentier states, relying on resource revenues rather than taxation for revenue. This can lead to reduced accountability to citizens, reduced pressure for reform, and underinvestment in the productive sectors of the economy. This theory aligns with the resource curse,

suggesting that dependence on natural resources can hinder development and exacerbate poverty. However, it provides a more nuanced understanding of the socio-political factors that contribute to the curse. Understanding the dynamics of rentier states can help policymakers and stakeholders in Nigeria develop strategies to address poverty and inequality by:

- Ensuring transparency and accountability in resource management to prevent corruption and rent-seeking behavior.
- Investing resource revenues in diversifying the economy and developing non-resource sectors, such as agriculture, manufacturing, and services, to reduce dependence on oil.
- Promoting inclusive growth by addressing inequality, investing in education, health, and infrastructure, particularly in underdeveloped regions, to provide equal opportunities for all Nigerians.

2.2.2 Oil Revenue and Poverty: The Resource Curse/Dutch Disease

Resource curse, also known as the paradox of plenty, describes the phenomenon wherein resource-rich countries fail to reap the benefits of their natural wealth, often experiencing negative socio-economic and political outcomes such as underdevelopment, corruption, conflict, and authoritarianism. The discovery of natural resources should be a catalyst for growth and prosperity, but can often become a cause for instability and misery. The resource curse is hypothesized to be affected by various factors and circumstances, and the "lottery analogy" provides a simple illustration of the challenges faced by countries dealing with newfound wealth. The socio-economic and political implications of the resource curse on resource-rich countries are far-reaching, including:

- Corruption: The abundance of natural resources can create a climate of corruption, with political leaders and elites becoming entrenched in systems of patronage and rent-seeking behavior, leading to a lack of transparency and accountability.
- Conflict: The unequal distribution of natural resource wealth can exacerbate existing social and ethnic tensions, leading to violent conflicts and civil wars (Opaleye 2018),

2.3 Empirical Literature

The relationship between the oil sector performance and poverty in Nigeria remains a complex topic, with various studies presenting divergent findings and interpretations. Some researchers, such as Adelowokan and Osoba (2015) and Nweze and Edame (2016), have identified a negative correlation between oil revenue and poverty alleviation, primarily due to misappropriation of government spending and inefficient resource utilization. These studies call for diversification of economic sectors to foster sustainable growth and development. Other studies have focused on the specific effects of oil revenue on poverty, with Edoumiekumo *et al.* (2013), exploring the concept of multidimensional energy poverty in the South-South region, proposing an inclusive enlightenment program as a solution. Chijoke and Felix (2020) identified a lack of economic transformation as a driver of unemployment and poverty in the region.

The need for legislative reform has also been discussed by Ezirim et al. (2016), who argued for a review of existing revenue-sharing formulas, which they believe exacerbate tensions between oil-producing states and the national government. The call for equity and transparency in revenue allocation highlights the complexity of the political dynamics involved in the management of oil revenue in Nigeria.

On the other hand, Ahmad and Saleh (2015) and Odularu (2008) have found a positive link between oil revenue and economic growth in Oman, underscoring the critical role of oil revenue in driving economic progress. However, the study emphasized the need for reform in government spending management and diversification of income sources to mitigate volatility and ensure stability. These contrasting findings indicate that the interplay between the oil sector and poverty in Nigeria is multifaceted and contingent upon various factors, including governance, fiscal management, and economic diversification.

On the impact of oil revenue on economic growth in Nigeria some studies, such as those by Amade, Atabo, and Joshua (2021), emphasized the positive short-term effects, Olayungbo and Adediran (2017) advocated for a long-term view, highlighting the potential diminishing returns over time. These divergent findings underscore the multifaceted nature

of the relationship between oil revenue and economic growth.

Relating oil sector performance to inequality, cross country studies like, Kim and Lin (2018) argued that oil abundance, if distributed equitably, can lead to better education and health outcomes, reducing income inequality in industrialized and emerging countries. Parcero and Papyrakis (2016) asserted that, except for the very rich-oil nations, oil is associated with lower income inequality. Steinberg (2017) suggested that oil booms exacerbate brain drain, particularly in poor countries. Kim et al. (2020), investigated to know if oil drive income inequality using dynamic panel co-integration techniques to account for the cross-country heterogeneity, cross-section dependence, and feedback effects in the oil-volatility-inequality relationship. The results show that oil abundance increases human capital investment, improves institutional quality, and hence lessens income inequality. Nevertheless, oil volatility has the opposite influence. This follows the trend in the resource curse literature that it is the volatility, rather than the level of oil that causes the paradox of plenty. Their findings also shed light on the factors that shape a country's response to its oil richness and volatility and offer policy implications for alleviating the losses associated with oil volatility

Fum and Hodler (2010) highlight the role of ethnic divisions in determining the effect of natural resources on income inequality. Leamer et al. (1999) suggested that resource abundance may lead to higher income inequality through reduced human capital accumulation and a reallocation of physical capital. Gylfason and Zoega (2003) emphasized the importance of equal capital distribution between resource and non-resource sectors in determining inequality. Buccellato and Mickiewicz (2009) and Carmignani (2013) also indicated a positive association between natural resources and income inequality.

On the other hand, Stijns (2006) and Ross (2008) have failed to identify a correlation between natural resources and income inequality, suggesting that a lack of transparency in resource-rich countries may result in under-reporting of income inequality data, skewing estimates.

This divergence of findings highlights the intricate nature of the relationship between natural resources and income distribution, underscoring the need for further research and in-depth analysis of the mechanisms through which resource abundance affects income inequality, taking into account factors such as distribution of capital, transparency in data reporting, and societal structure.

III. METHODOLOGY

3.1 Research Design
The study utilizes a combined approach of descriptive and ex-post facto research designs to provide a robust analysis of the trends and patterns in the relationship between oil sector performance and poverty incidence. The 45-year timeframe, spanning from 1980 to 2025, offers a comprehensive overview of the long-term relationship between these two vital economic indicators. This extended period allows for a thorough exploration of the patterns and trends, enabling a deeper understanding of the interplay between the oil sector and poverty in Nigeria

3.2 Model Specification
In order to analyze the effects of oil performance on poverty in Nigeria, we rely on the endogenous growth theory, developed by leading economists such as Arrow and Romer. The theory proposes that long-term economic growth is achievable through internally generated forces within the economic system. This includes the accumulation of human and physical capital, as well as technological advancements (Ekpo, et $al;$2025). The model can be expressed as Equation 3.1, with gross fixed capital formation representing physical capital.

$$Y = AK \qquad \text{Equation 3.1}$$

where, Y is output growth; A is technological growth and; K is capital stock. Earlier version of the model assumes that K consist of human capital (h) and physical capital (p). Many studies have proxied gross fixed capital formation as an important substitute for physical capital and will be applied in this study. Thus, Equation 3.1 becomes Equation 3.2:

$$Y = A\, K_h K_p \qquad \text{Equation 3.2}$$

Because K is expandable, it is possible that modern version of Equation 3.1 can be written as shown by Equation 3.3 as:

$$Y = A\, K_h K_p K_f \qquad \text{Equation 3.3}$$

where f is financial capital. Equation 3.3 extends this model, incorporating financial capital as a contributing factor to economic growth alongside technology and the accumulation of human, physical, and financial capital.

The notion that increased oil sector performance can potentially reduce poverty in Nigeria is plausible. Given that oil revenue accounts for a substantial share of government income, any improvements in oil output and efficiency could potentially contribute to poverty alleviation efforts. Restating Equation 3.1 gives Equation 3.4 as follows:

$$Y_\delta = AK_h\,K_p\,K_{OSep} \qquad \text{Equation 3.4}$$

where, δ is a measure of poverty and (osep) a set of oil sector performance indices (in this case oil sector output (Oilp) and oil sector revenue (Or)). Given the interconnected nature of poverty indicator and the general economy, it is plausible that changes in poverty indicator can significantly impact economic growth and development. In this context, understanding how fluctuations in poverty incidence, represented by δ, affect the economy, denoted by Y, is crucial for policymakers seeking to promote growth while minimizing poverty and inequality. Generally, all subsets of economic activities have implications for the general economy Y. Thus, the effect of oil sector performance on poverty is expected to alter the general economy stance at time t.

Other variables to include are unemployment, government expenditure, and institutional quality. Rewriting Equation 3.1 in the light of the above, our specification now becomes Equation 3.5 as:

$$Y_\delta$$
$$= AK_h\,K_p\,K_{OSep}\,K_g\,K_{inq}\,K_{ge} \qquad \text{Equation 3.5}$$

For g (gross domestic product (gdp), institutional quality (inq), government expenditure (ge)). Thus, formal equation to be estimated is of the form as shown by Equation 3.6 as:

$$Y_\delta = f\,(p, Osep, gdp, inq, ge) \qquad \text{Equation 3.6}$$

Expanding Equation 3.6 and disintegrating Y_δ gives Equation 3.7

$$Pov_t = \alpha_{0t} + \alpha_1 gfc_t + \alpha_2 Or_t + \alpha_3 Oilp_t + \alpha_4 gdp_t$$
$$+ \alpha_5 insq_t + \alpha_6 ge_t$$
$$+ \varepsilon_t \qquad \text{Equation 3.7}$$

where, Pov_t is Poverty; gfc_t is gross fixed capital formation; Or_t is Oil Sector Revenue; $Oilp_t$ is Oil Sector Output; gdp_t is gross domestic product; $insq_t$ is institutional quality; ge_t is government expenditure; ε_t is error term.

Equation 3.7 will answer the core objective of the study which is to examine the impact of oil sector performance on poverty in Nigeria.

3.3 Analytical Technique

A Vector Autoregressive (VAR) model was employed in this study to assess the dynamic interrelationships among the variables. A VAR model considers all variables as endogenous, which allows for analysis of the mutual influence of each variable on the others, thereby providing a holistic understanding of the complex interdependencies within the system. Following the work of Bassey and Ekong (2019) who investigated the Vector Autoregression of order p (VAR (p)), we can express the VAR model as:

$$Zt = \boldsymbol{B}jZt-1 + \ldots + \boldsymbol{B}pZt-p + et$$

Equation 3.8

where Zt and et are n x 1 vectors and Bj are n x n matrices. Equation (3.8) specifies that any series depends on the past history of all the n series through their lagged values.

Therefore, functional VAR relationships of equation 3.7 can be stated as shown by Equation 3.9 as follows:

$$Pov_t = \alpha_{0t} + \sum_{j}^{n} \alpha_1 Pov_{t-1} + \sum_{j}^{n} \alpha_2 p_{t-1}$$
$$+ \sum_{j}^{n} \alpha_3 Or_{t-1} + \sum_{j}^{n} \alpha_4 Oilp_{t-1}$$
$$+ \sum_{j}^{n} \alpha_5 gdp_{t-1} + \sum_{j}^{n} \alpha_6 insq_{t-1} + \sum_{j}^{n} \alpha_7 ge_{t-1}$$
$$+ \varepsilon_t \qquad \text{Equation 3.9}$$

Equation 3.8 in this context encompasses seven variables, necessitating the employment of an Autoregressive Distributed Lag (ARDL) model to analyze the dynamic interrelationships between oil sector performance and poverty indicators. Pesaran and Shin (1999) and Pesaran, Shin and Smith (2001) pioneered studies using the ARDL approach, which allows for the investigation of both short-run and long-run relationships among variables (Ekpo *et al* 2024). The ARDL model is a valuable tool in understanding the dynamic interactions among the economic variables of interest,

The basic form of an ARDL (p, q₁, q₂….qₘ) model is specified as shown by Equation 3.10 as thus:

$$\pi_t$$
$$= \sum_{i=1}^{\rho} \delta_\kappa \pi_{it-\rho} + \sum_{i=0}^{q} \beta_\kappa x_{it}$$
$$+ \mu_t \qquad \text{Equation 3.11}$$

where π_t, is the explained variable; x_t, are the vector of explanatory variables in the model which could be endogenous or exogenous; μ_t, is a white noise variable assumed to be serially independent of other

variables in the model; *(p,q)* are the various lags of the variables in the model, $(\delta_\kappa, \beta_\kappa)$ are estimated parameters to their lags κ, and $q = 1,2..m$. An expansion of the above model to a standard bound testing procedure becomes Equation 3.12:

$$\Delta\pi_t = \delta_o + \sum_{i=1}^{\rho} \delta_\kappa \Delta\pi_{it-\rho} + \sum_{i=0}^{q} \beta_\kappa \Delta x_{it-q}$$
$$+ \psi_1 \pi_{it-1} + \psi_{2i} x_{it-1}$$
$$+ \mu_t \qquad \text{Equation 3.12}$$

where, ψs, are the parameters of all the included variables in the model lagged one period, Δ, is the difference operator, other indices are as already defined.

3.5 Diagnostic Test

Pre-Estimation Test:

Stationarity Test:

In conducting time-series analysis, a crucial step is to ensure that the variables are stationary, avoiding spurious findings. The PP test of stationarity, developed by Perron (1997), is the preferred method in this study. Unlike traditional methods, such as the augmented Dickey-Fuller test, the PP test considers structural changes that may occur at unknown points in time, allowing for a more robust analysis of the time-series properties of the variables under study. The PP test is specified as:

$$\theta_\alpha^*$$
$$= \theta_\alpha \left[\frac{\gamma_\circ}{\omega_\circ}\right]^{\frac{1}{2}}$$
$$- \frac{T(\omega^\circ - \gamma^\circ)[se(\varphi)]}{2\omega_\circ^{\frac{1}{2}} s} \qquad \text{Equation 3.13}$$

where, φ is the estimate, and θ_α is the t-ratio of φ, $se(\varphi)$ is the coefficient standard error, and s is the standard error of the regression equation. ω° and γ° are the residual spectrum at zero frequency and consistent estimate of the error variance respectively. The Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test was employed. In the KPSS, the null hypothesis is that the variable in question is stationary and the decision criteria is to accept the null only if the absolute value of the calculated statistic is below the critical value at the accepted level of significance (Ekong and Ekong, 2017). The test statistics are obtained by regressing the residuals of a regression on the independent variables of the original regression and is given as:

$$KPSS = \frac{1}{T^2} \cdot \frac{\sum_{t=1}^{T} S_t^2}{\varpi_\infty^2} \qquad \text{Equation 3.14}$$

where, $S_t = \sum_{s=1}^{t} \hat{e}_s$ is a partial sum, ϖ_∞^2 is the HAC estimator of the variance of $\hat{e}_t$, T is the Sample size

Post Estimation Diagnostics:

These are diagnostic test used to test for the fulfillment of methodological assumptions of regression estimates. Based on the techniques adopted for the study, the post diagnostic test to be used are the Test for Autocorrelation, Test for Heteroscedasticity, Model Stability Test using CUSUM and CUSUM of Squares tests. The explanation of variables and *A priori* expectation

Table 3.1: Explanation of variables and *Apriori* expectation

S/N	Variables	Description	Sources	Apriori Expectation
1.	Oil Revenue	In the context of Nigeria's oil-dominated economy, oil revenue is the principal source of income, providing the foundation for government planning, budgetary, and fiscal processes. Oil revenue refers to the total income generated from the sale of crude oil and other oil products, both domestically and internationally. Oil revenue accounting for approximately 80% of government. It is independent variable in the model.	CBN statistical bulletin	$\alpha_2 < 0$
2.	Poverty	Poverty, a multifaceted concept, encompasses the inability to access essential human needs such as food, clothing, shelter, clean water, and healthcare. Its measurement varies, with common indicators such as the Deninger's database, Gini coefficient, annual per capita income, and population living below the poverty line. However, due to	Computed	PPC < 0

		a scarcity of long-term data, studies in the African subregion typically rely on Private Per Capita Consumption (PCC) to measure poverty		
				(Table continues)
3.	Gross fixed capital formation	Gross Fixed Capital Formation (GFCF), previously termed gross domestic fixed investment, is a key component of a country's national accounts, representing the net accumulation of fixed assets during a specified period. GFCF encompasses a wide range of investments, including land improvements, infrastructure development, and capital asset purchases, encompassing both public and private sectors. In the proposed model, GFCF is considered an independent variable, its fluctuations influencing the overall economic growth and development of the country.	CBN statistical bulletin	$\alpha_1 < 0$
4.	Government Expenditure	This is the total of all expenses made by federal government. In Nigeria, total capital expenditure is the addition of recurrent expenditure and capital expenditure. Many studies have confirmed the expansionary powers of government expenditure on economic growth that could spill over to poverty mitigation. GE is an independent variable in the model.	CBN statistical bulletin	$\alpha_6 < 0$
5.	Gross Domestic Product	The gross domestic product measures the monetary value of all the output produced in a country in an accounting period, usually one year. Basically, the addition of total consumption, investment, government expenditure and net exports gives GDP. Many studies have used the gross domestic product as a proxy for economic growth. GDP is an independent variable in the model.	CBN statistical bulletin	$\alpha_4 < 0$
6.	Oil sector output	This is the yearly oil sector contribution to gross domestic product. Oil sector output is an independent variable in the model.	World Development Indicators	$\alpha_3 < 0$
7.	Institutional quality	Institutions are vital societal structures that facilitate economic growth by organizing groups, streamlining interactions and coordination, and reducing uncertainty in economic activities. Their impact on economic performance is intricately tied to their quality, with robust and efficient institutions fostering resource efficiency, factor accumulation, and innovation. In our model, institutional quality is represented by the index of corruption, serving as an independent variable. This measure aims to capture the overall effectiveness of institutions in curbing corrupt practices and promoting transparency and accountability	Computed	$\alpha_5 < 0$

Source: Researchers' field work (2025).

IV. OIL SECTOR PERFORMANCE AND POVERTY INCIDENCE IN NIGERIA: THE HISTORICAL TREND

These stylized facts bring to light a concerning paradox: despite the oil sector's significant contributions to Nigeria's economy, poverty and unemployment remain prevalent. The failure of oil revenue to significantly reduce poverty highlights the economy's continued dependence on oil and structural constraints hindering its benefits from reaching the poor. The Nigerian economy's apparent inability to effectively translate oil sector performance into poverty alleviation reveals a critical challenge that must be addressed for equitable economic growth and development to be achieved.

The relationship between oil sector performance and poverty rate in Nigeria from 1980 to 2024 is shown in Figure 4.1.

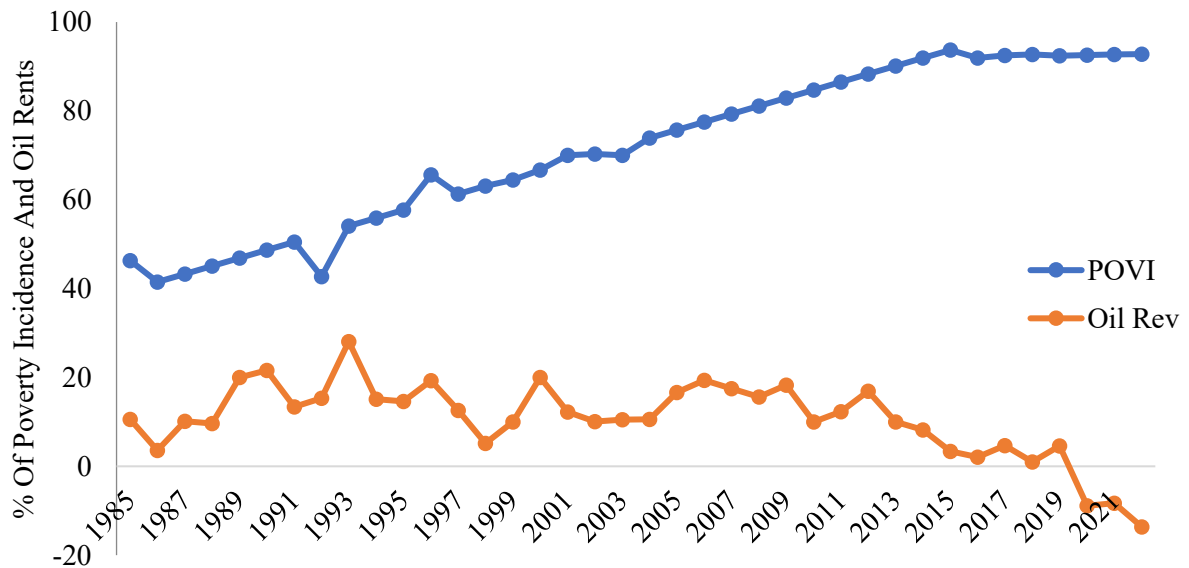4.1. The Trend of Nigeria Oil Revenue and Poverty Rate

Figure 4.1: Nigeria: Poverty rate and oil revenue (1985 – 2025).
Source: World Development Indicators (2025).

Figure 4.1 indicate that the poverty rates in Nigeria, generally on an upward trend from 1980 to 2020, spiked during certain periods. Economic downturns due to falling crude oil prices and interest rates in the early 1980s, coupled with sharp declines in oil revenue during the 2015-2016 recession, largely as a result of factors such as crude oil theft, debt arrears in joint venture agreements, insecurity in oil-producing areas, and low investment in oil and gas sectors.

V. DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

5.1 Data Presentation
5.1.1 Descriptive Properties
Descriptive analysis of the variables in the study, as presented in Table 5.1, indicates that most variables displayed average measurements, with real gross domestic product (36138.4) and oil sector output (3527.0) displaying the highest average values. Some variables, including poverty rate, gross fixed capital formation, and corruption perception index (as a proxy for institutional quality), exhibited negative skewness. In contrast, most other variables exhibited positive skewness, with real gross domestic product being the most positively skewed (1.3177).

Table 5.1: Descriptive properties of the variables

Variables	Pov Rate	Gfcf	Oil Rev	Oil Output	gdp	Insq	ge
Mean	49.4859	21.1115	2437.385	3572.024	36138.36	13.1521	2133.421
Median	48.8000	21.9620	1411.264	1004.394	7515.812	16.0000	982.8450
Maximum	69.9000	33.0400	8878.970	1342.87	173527.7	28.0000	9145.157

Minimum	28.1000	9.8970	7.2530	4.2800	139.2701	0.0000	9.6400
Std. Dev.	11.3431	5.3446	2689.885	4395.278	49588.84	11.4522	2552.465
Skewness	-0.1061	-0.1678	0.7037	0.9189	1.3177	-0.0817	1.0629
Kurtosis	2.0882	2.7598	2.2059	2.3065	3.5394	1.2865	3.0851
Jarque-Bera	1.5336	0.2980	4.5701	6.7537	12.6641	5.1849	7.9203
Probability	0.4644	0.8616	0.9708	0.0342	0.0018	0.0748	0.0191
Observations	42	42	42	42	42	42	42

Source: Researchers' computation from e-views 12 (2025).

The correlation analysis, as depicted in Table 5.2, indicates that all variables exhibit positive correlations, with gross domestic product and government expenditures displaying the strongest correlation (0.98). The corruption perception index, serving as the institutional quality proxy, exhibit the weakest correlation (0.01).

The two oil sector performance variables, namely oil revenue and oil sector output, exhibit moderate correlations with several variables (e.g., poverty rate, gross fixed capital formation), while displaying strong correlations with others (gross domestic product, government expenditures, and institutional quality)

The descriptive and correlation analyses provide valuable insights into the general performance of the Nigerian economy, highlighting patterns and relationships among the variables under consideration. These preliminary findings establish a solid foundation for the subsequent analysis of the relationship between oil sector performance and poverty incidence in Nigeria.

Table 5.2: Correlation of the variables

Variables	Pov Rate	Gfcf	Or Rev	Oil Output	gdp	Inqs	ge
Pov rate	1						
Gfcf	0.0233	1					
Oil Rev	0.1174	0.2658	1				
Oil Output	0.2963	0.2303	0.8959	1			
gdp	0.3613	0.0282	0.7036	0.9034	1		
Inqs	0.0163	0.0951	0.8559	0.8291	0.7638	1	
ge	0.3099	0.0226	0.7906	0.9232	0.9790	0.8255	1

Source: Researchers' computation from e-views 12 (2025).

Next, is presentation of the stationarity properties of the variables for the study as shown in Table 5.3, all variables were stationary at various levels of difference not exceeding first difference.

Table 5.3: Unit root test

Variables	PP Level	Prob	PP 1st Diff	Prob	KPSS Level	Prob	KPSS 1st Diff	Prob
gdp	12.4388	1.0000	-11.1264*	0.0000	0.6809*	0.0000		
Pov	-3.9185*	0.0043			0.2329*	0.0000		
Insq	2.9733	1.0000	-3.9332*	0.0043	0.7443	0.6036	0.1484*	0.0162
Oil Rev	-1.4531	0.5470	-7.0592*	0.0000	0.6639*	0.0000		
Gfcf	-2.3086	0.1743	-5.2646*	0.0001	0.0795*	0.0000		
Oil Output	-0.5405	0.8725	-5.6099*	0.0000	0.7021*	0.0000		
ge	3.2774	1.0000	-4.1017*	0.0026	0.7413*	0.0000		

Note: *,**,*** represent significance at 1%, 5% and 10% respectively.
Source: Researchers' computation from e-views 12 (2025).

Most variables were stationary at levels when the KPSS test statistic was used except institutional quality that was stationary at first difference. The stationarity property of the variables being stable at level not exceeding first difference guarantees our use of ARDL apparatus in our analysis.

5.2   Findings

To assess the effect of oil sector performance on poverty incidence in Nigeria, the initial step involved analyzing the functional relationship for the model. The findings indicated that both double-log and exponential specifications were stable. However, the double-log specification was selected for the analysis to ensure an unbiased weighting of the variables. This choice of specification enabled a balanced exploration of the impact of oil sector performance on poverty incidence in Nigeria.

Table 5.4: Model selection test

Dependent variable: Pov. rate

Models/Variables	Linear	Semi-log	Double-log	Exponential
GFCF	-0.1824	-0.0036	-0.1142**	-6.1058***
Or Rev	0.0405	9.5507	0.0936	4.3833
Oil Output	-0.0014**	-3.5501	-0.0423*	-2.4386**
gdp	-0.0002	-1.7706	-0.4654*	-2.2742***
Inqs	0.7609**	0.0157**	-0.0043	-0.2472
ge	0.0003	-6.9906	0.4633**	2.0270**
C	51.9918*	3.9243*	5.1637*	111.6589*
R^2	0.82	0.72	0.81	0.84
DW	1.51	1.54	1.72	1.74

Note: *,**,*** represent significance at 1%, 5% and 10% respectively.
Source: Researchers' computation from e-views 12 (2025).

To determine the appropriate lag structure for the analysis, various information criteria were evaluated, as shown in Table 5.5. While the Schwarz Information Criterion (SC) and Hannan-Quinn Information Criterion (HQ) indicated that one lag was sufficient, the sequential modified LR test statistic (LR), Final Prediction Error (FPE), and Akaike Information Criterion (AIC) argued for the inclusion of two lags for the endogenous variables. In line with the AIC criterion and other factors, two lags were included for all variables in the analysis.

Table 5.5: VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-206.0714	NA	9.993105	10.65357	10.94912	10.76043
1	51.17801	411.5990	3.127709	0.241100	2.605531*	1.096003*
2	108.4039	71.53235*	2.605409*	-0.170194*	4.263114	1.432750

Note: * indicates lag order selection criteria.
Source: Researchers' extracts from e-views 12 (2025).

The impulse response functions for the variables under study were examined to understand the effect of a one-time shock to the innovations on the poverty level in Nigeria as presented in Figure 5.1. For innovations to oil revenue, the initial insignificant positive effect transitioned into insignificantly declining effects from the fourth to seventh periods, followed by insignificant positive impact from the eighth to tenth periods. For oil sector output, innovations had an initial insignificant negative effect on poverty from the pre-shock period to the second period, transitioning into insignificant positive effects from the third to tenth periods

The effects of innovations to capital stock were negatively insignificant from the second to fifth periods, followed by insignificant positive and negative undulating effects from the sixth to eighth periods. Innovations to institutional quality initially caused insignificant negative effects on poverty from the pre-shock period to the fifth period, followed by insignificant positive effects from the sixth to eighth periods and insignificant negative effects from the ninth to tenth periods.

Innovations to national income had insignificant mixed effects on poverty from the pre-shock period to fourth period, followed by insignificant negative effects from the fifth to tenth periods. Self-inflicted

innovations from poverty produce statistically insignificant impulses on poverty that appears from the pre-shock period to the tenth period. We gleaned from this behavior that past efforts on poverty reduction generated positive future reduction on poverty within regions. Cleary, government expenditure did not reduced poverty in Nigeria over the study period. Accelerated innovations on government expenditure produces positive impacts on poverty in Nigeria generally throughout the period with some dips in the third and the sixth periods not

capable of actually reducing poverty generally. The results of the impulse response functions suggest that the effects of innovations in oil sector performance, capital stock, institutional quality, and national income on poverty reduction in Nigeria are largely mixed and insignificant in the short-run. However, the negative impact of innovations in national income in the long-run indicates a need for further investigation and policy intervention to ensure that economic growth and poverty reduction efforts are aligned.
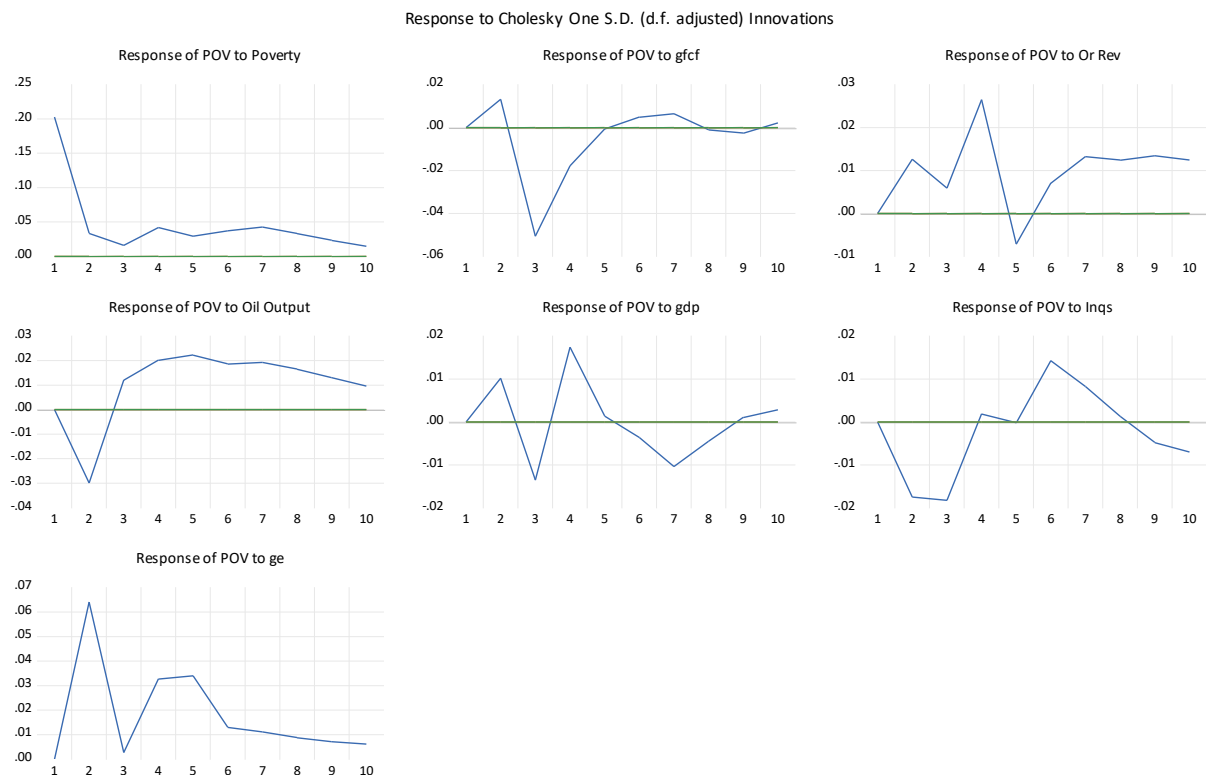

Figure 5.1: Impulse responses of poverty to other endogenous variables.
Source: Researchers' extracts from e-views 12 (2025).

The variance decomposition of our oil sector performance and poverty in Nigeria is reported in Table 5.6. Table 5.6 reveals that the cumulative impact of oil sector performance on poverty alleviation in Nigeria was approximately 7.0%. On an individual level, the positive impact of oil sector revenue on poverty innovations ranged from 2.5% to a maximum of 10% during the second to tenth period. Similarly, oil sector output and national capital stock contributed approximately 5.0% each to poverty innovations, while government expenditure

contributed 10% and institutional quality only 1%. Furthermore, the study found that the main driver of innovations in poverty was the own innovations within the poverty variable, contributing 75.0% to poverty variations over the study period. This underscores the complexity of poverty dynamics, highlighting the importance of comprehensive policies and interventions that address both external factors, like the oil sector, and internal drivers of poverty.

Table 5.6: Variance decomposition of the variables

Dependent Variable: Poverty

Period	S.E.	Pov rate	gfcf	Or Rev	Oil Output	gdp	Insq	ge
1	0.202809	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.219091	88.03358	0.364210	0.329879	1.864620	0.216964	0.638487	8.552260
3	0.226994	82.50834	5.317056	0.373860	2.017951	0.556769	1.244600	7.981426
4	0.236813	78.92312	5.453751	1.594822	2.581122	1.052770	1.150018	9.244398
5	0.242143	76.93138	5.217181	1.612305	3.313865	1.010166	1.099997	10.81510
6	0.246596	76.42660	5.069591	1.637592	3.766655	0.995465	1.397645	10.70645
7	0.252018	76.03412	4.919071	1.843501	4.189229	1.123582	1.444487	10.44601
8	0.255248	75.82081	4.797113	2.034659	4.505978	1.126668	1.410656	10.30411
9	0.257145	75.52241	4.736508	2.277992	4.697377	1.111851	1.424558	10.22930
10	0.258220	75.20668	4.703996	2.491275	4.795719	1.114536	1.486117	10.20167

Cholesky Ordering: poverty, gross fixed capital formation, Oil revenue, Oil output, gross domestic product, institutional quality and government expenditure

Source: Researchers' extracts from e-views 12 (2025).

Model Stability Checks
The stability of the estimated VAR system depends on the roots of the autoregressive polynomial remaining within the unit circle. In Figure 5.2, it is evident that all the variables' roots lie within the acceptable radius, which confirms the reliability of the estimated model. This stability suggests that policy recommendations derived from the analysis are valid and can potentially contribute to informed decision-making for poverty alleviation strategies in Nigeria.
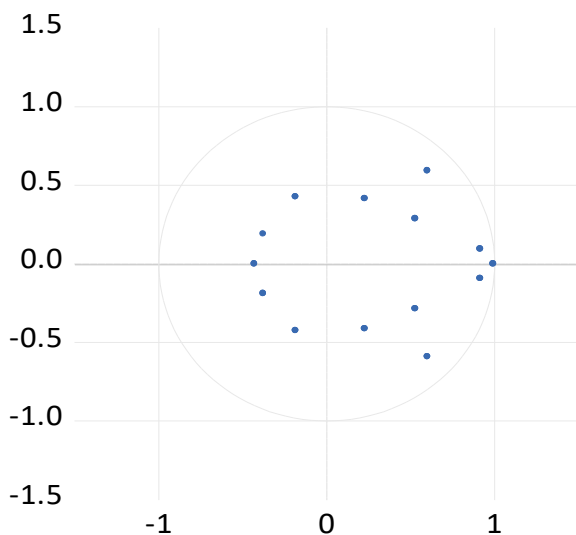

Figure 5.2: Inverse roots of the AR characteristic polynomial.
Source: Researchers' extracts from e-views 12 (2025).

The correlation structure of the model using the VAR heteroscedasticity test was also tested and the results was presented in Table 5.7. The joint test probability of 0.24 is greater than 0.05 under the null hypothesis of homoscedasticity which requires that the null hypothesis cannot be rejected. Thus, multicollinearity is free from bias system.

Table 5.7: VAR residual heteroskedasticity tests
Joint test:

Chi-sq	df	Prob.
811.1914	784	0.2433

Source: Researchers' extracts from e-views 12 (2025).

5.3   Discussion of Findings
This study revealed a multifaceted interplay between oil sector performance, poverty, and institutional factors in Nigeria. While oil revenue had a modest, insignificant positive impact on poverty in the long-run, oil sector output had a short-term decline in poverty, with insignificant effects thereafter. A 1% improvement in institutional quality positively influenced oil revenue growth by 66%, demonstrating the potential gains of curtailing corporate corruption within oil-related institutions. This aligns with findings from Arezki and Brückner (2009) for cross-country comparisons in Asia but diverges from Aslaksen's (2010) negative relationship for some OPEC countries in Africa.

VI.   SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Summary
This study delves into the intricate relationship between oil sector performance and poverty incidence in Nigeria, employing a comprehensive

analysis of poverty incidence spanning the period from 1980 to 2025. The investigation centers on key dimensions such and institutional quality.

The major findings of this study on the basis of which appropriate policy recommendations are proffered can be summarized as follows:

i. Increases in oil revenue produced positive insignificant impact on poverty.

ii. Oil sector output produced a negative significant impact on poverty.

iii. Fixed capital stock produced a negative and insignificant impact on poverty.

iv. Corruption perception index (proxy for institutional quality) produced a negative impact on poverty and was statistically insignificant.

v. Gross Domestic Product (GDP) impacted negatively on poverty and was statistically significant.

6.2 Conclusion

This study illuminates the intricate relationship between oil sector performance and poverty in Nigeria. We deployed ARDL and VAR to investigate the impact of various oil sector indicators, including revenue and output, on poverty incidence over a period spanning from 1980 to 2024. The empirical findings reveal nuanced insights, highlighting the positive but statistically insignificant impact of oil revenue on poverty alleviation and the negative and significant impact of oil sector output on poverty. Our results are consistent with Okowa's (1994) general theory of development, which underscores the critical role of natural resources in a nation's development

6.3. Recommendations for Policy

To optimize the economic benefits of oil sector performance and mitigate poverty, Nigeria must focus on implementing a range of strategic measures:

- Reinvesting oil revenue prudently in productive sectors such as agriculture and manufacturing to create jobs and lower unemployment rates.

- Decentralizing oil revenue distribution to state or community ownership to promote true federalism and reduce corruption.

- Fostering a savings culture to mitigate volatility in oil revenue.

- Facilitating regulatory collaborations between institutions to maximize the benefits from oil sector revenue and mitigate systemic leakages.

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